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## Content

# Introduction

*Charlotta Zetterberg*

I have now the honor of presenting a new issue (the twenty-third in order) of the Nordic Environmental Law Journal. It includes five contributions. First out is Vito De Lucia with *The Ecosystem Approach and the negotiations towards a new Agreement on Marine Biodiversity in Areas beyond National Jurisdiction*. Here is the use and potential future use of the ecosystem approach in a marine biodiversity context analyzed. The article highlights and discusses risks and opportunities linked to different modalities of the approach's inclusion in a future international legally binding instrument.

The study object of the second article: *Resilience and Adaptivity of EU Pesticides Law – Assessing Theory and Legal Capacity*, written by Henrik Jansson, is EU Pesticide law. The author scrutinizes the legislation from a "planetary boundaries" perspective by using social-ecological resilience theory. Even if additional theoretical concepts and tools are needed or should be improved for not contributing to transgression of planetary boundaries, a conclusion is that current legal instruments in several ways have adaptive capacity, which is a core element in the theory.

The third article: *Vad är en plan? – En analys av Sveriges implementering av direktivet om strategisk miljöbedömning*, authored by Henrik Josefsson, focuses on the Swedish implementation of EU:s directive 2001/42 on the assessment of the effects of certain plans and programmes on the environment. The main aim is to analyze how well Swedish law complies with the directive, especially with regard to the core concepts "plan" and "significant environmental effects" in the directive. The author concludes that the difference between these two legal regimes is so big that Sweden can hardly be said to pursue its EU legal obligations in this area.

The focus of the next article: *Reaching for Green Chemistry*, written by Mikael Karlsson and Natasja Börjeson, is EU's chemical regulation, REACH, from 2006. The authors evaluate if and how REACH promotes "green chemistry" which is a pollution prevention initiative that aims to promote sustainable development through designing chemical products and processes in a way that reduces or eliminates chemical risks and the use and generation of hazardous substances. The article provides recommendations on how to better reach for green chemistry, and

discusses how gaps between environmental goals and industrial practice can be better bridged by legislation.

In the fifth and last article: *Ought states to be legally obliged to protect the sustainability of the global environmental system?*, Nicolai Nyland questions the traditional paradigm of international law, which is that states have sovereignty over the environment within their territory and jurisdictional areas. One proposal that is presented is that sovereignty as a legal concept should be reinterpreted or reframed, emphasizing the duty to protect the environmental sovereignty – the sustainability – of all states.

I wish you all a good reading!

# The Ecosystem Approach and the negotiations towards a new Agreement on Marine Biodiversity in Areas beyond National Jurisdiction

*Vito De Lucia**

**Abstract**

The ecosystem approach is an increasingly central concept for addressing the conservation and sustainable use of biological diversity. Endorsed in the mid-1990s as the primary framework of action by the Convention of Biological Diversity, it has subsequently gained traction in a variety of fields and contexts, including ocean governance and fisheries management,** thanks to its promise to overcome the traditionally fragmented management paradigm, and instead facilitate holistic ecosystem governance. Not surprisingly then, the ecosystem approach is one of the suggested guiding principles and/or approaches for a future international legally binding instrument (ILBI) on marine biodiversity in areas beyond national jurisdiction (BBNJ). This article will assess the status of the debate on the ecosystem approach in the BBNJ process, to highlight and analyse risks and opportunities linked to the different modalities of its inclusion in a future ILBI.

## 1. Introduction

The ecosystem approach is an increasingly central concept for addressing the conservation and sustainable use of biological diversity. Endorsed in the mid-1990s as the primary framework of action by the Convention of Biological Diversity,[1] it has subsequently gained traction in a variety of fields and contexts, including ocean governance[2] and fisheries management,[3] thanks to its promise to overcome the traditionally fragmented management paradigm, and instead facilitate holistic ecosystem governance. Not surprisingly then, the ecosystem approach is one of the suggested guiding principles and/or approaches for a future international legally binding instrument (ILBI) on marine biodiversity in areas beyond national jurisdiction (BBNJ). This article will assess the status of the debate on the ecosystem approach in the BBNJ process, to highlight and analyse risks and opportunities linked to the

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** See e.g. Food and Agriculture Organisation (FAO), *Fisheries Management: The Ecosystem Approach to Fisheries, FAO Technical Guidelines for Responsible Fisheries*, No. 4, Suppl. 2. Food and Agriculture Organizations of the United Nations 2003.

[1] Decision II/8, 'Preliminary Consideration of Components of Biological Diversity Particularly Under Threat and Action Which Could Be Taken Under the Convention', Jakarta, 6–17 November 1995, UNEP/CBD/COP/DEC/II/8.

[2] See e.g. Report on the work of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea at its Seventh Meeting, ICP-7 Report, 17 July 2006; Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention), adopted 22 September 1992, entered into force 25 March 1998), 2354 UNTS 67; OSPAR Commission, *The North-East Atlantic Environment Strategy of the OSPAR Commission for the Protection of the Marine Environment of the North-East Atlantic 2010–2020*, OSPAR Agreement 2010–2013; Statement on the Ecosystem Approach to the Management of Human Activities, 'Towards An Ecosystem Approach To The Management Of Human Activities', JMM1, Bremen, 25–26 June 2003, Agenda item 6.

[3] See e.g. Food and Agriculture Organisation (FAO), *Fisheries Management: The Ecosystem Approach to Fisheries, FAO Technical Guidelines for Responsible Fisheries*, No. 4, Suppl. 2. Food and Agriculture Organizations of the United Nations 2003.

different modalities of its inclusion in a future ILBI. The article will proceed as follows. After a brief introduction of the concept of the ecosystem approach in sub-section 1.1, section 2 gives a brief overview of the BBNJ process so far and offers a detailed review of the ways in which the ecosystem approach has been included and discussed in the BBNJ process so far. Section 3 presents an overview of different articulations of the ecosystem approach in international law and at the same time illustrates how the concept remains both ambiguous and contested and is articulated differently in different contexts. Additionally, section 3.3 discusses the relationship between the ecosystem approach and UNCLOS, in order to understand if it is possible to delineate with some precision the concrete normative and operational implications of the ecosystem approach. UNCLOS is key in this sense as it sets out the general framework for ocean governance and that the future ILBI will be an implementing agreement of UNCLOS. Section 4 discusses the role the ecosystem approach could and should have in a future ILBI to ensure its effective and consistent implementation, and ultimately to ensure that the opportunity that the BBNJ process represents is not lost. Finally, section 5 draws some conclusions.

### 1.1. The Concept of the Ecosystem Approach in Brief

Before reviewing the ways in which the ecosystem approach has been included and discussed so far in the BBNJ process, it will be useful to present the concept in brief by way of outlining its key conceptual elements. The ecosystem approach can be generally described as a 'strategy for the integrated management of land, water and living resources'.[4] The concept translates key ontological and epistemological insights of ecology into law, and it rests, broadly speaking, on four interrelated elements: integration, integrity, information and iteration.

*Integration* reflects the ecological insight that 'everything is connected with everything else'[5] and that thus any management plan must heed this fact and take a holistic approach. By focusing on integration, the ecosystem approach also challenges the traditionally fragmentary approach of international law. It promises to integrate laws that regulate living resources with laws that regulate pollution and degradation of the physical environment; it aims at integrating, within a transversal ecosystem perspective, fragmented jurisdictional and political boundaries; and it typically aims at integrating the social and the ecological dimensions into a single conceptual and operative framework. The ecosystem approach, additionally, encourages epistemic integration, by incorporating a number of central ecological principles in law, and by drawing on multiple modes of knowledge. Ecological – or ecosystem – *integrity* is in many ways the underlying goal of the ecosystem approach.[6] While integrity is not always easy to concretely identify[7] and operationalize,[8] it aims at maintaining

[4] Decision V/6 'Ecosystem Approach', Nairobi, 15–26 May 2000, UNEP/CBD/COP/DEC/V/6.

[5] B. Commoner, *The Closing Circle: Nature, Man and Technology*, New York, Alfred Knopf, 1971, p. 16.

[6] Sometimes together with ecosystem health, though the difference between the two is not always entirely clear, V. De Lucia 2016, *The Ecosystem Approach in International Environmental Law. A Biopolitical Critique*, PhD Thesis, UiT The Arctic University of Norway, 2016.

[7] See in this respect G. De Leo and S. Levin, 'The Multifaceted Aspects of Ecosystem Integrity', 1:1, *Conservation Ecology* 1997, 3 and more recently G. Steinhoff, 'Ecological Integrity in Protected Areas: Two Interpretations', *Seattle Journal of Environmental Law*, 3, 2013, 155. There is however a significant literature that tries to do precisely that, primarily stemming from the work of the Global Ecological Integrity Group, see e.g. L. Westra, 'Ecological Integrity', in C. Mitcham (ed.) *Encyclopedia of Science, Technology, and Ethics*, Vol. 2, Detroit: Macmillan Reference USA, 2005.

[8] For an attempt see R. Kim, and K. Bosselmann 'Op-

certain key functions, structural elements and composition of ecosystems in order to ensure the conservation of biological diversity and the protection and preservation of the relevant ecosystems. *Information* refers to the crucial role that knowledge has for the implementation of the ecosystem approach. Detailed knowledge of ecosystem processes and of baseline conditions are paramount in order to understand what are the key stressors and for assessing whether a measure or plan is working. This last aspect links to the final element, *iteration*. Any ecosystem management measure needs to be iteratively assessed so as respond to changes in existing conditions, to the variability of natural processes and to the responses of ecosystems to various stressors and to management measures themselves.[9]

## 2. The Ecosystem Approach in the BBNJ process

### 2.1. The BBNJ Process in Brief

The process towards a new global treaty on the conservation and sustainable use of marine biodiversity in areas beyond national jurisdiction (BBNJ) started 15 years ago, as the international community recognized the existence of a series of important legal and governance gaps and underlined the urgency of developing norms and mechanisms aimed at protecting BBNJ.[10] In 2004, the General Assembly of the United Nations (UNGA) established an Ad Hoc Open-ended Informal Working Group (BBNJ WG) to study the issues further,[11] and in 2011 the BBNJ WG recommended that a 'process be initiated' towards the development of a multilateral agreement under UNCLOS on BBNJ.[12] The report also identified four substantive areas that would need to be addressed, 'together and as a whole'[13] by one such process: marine genetic resources, including questions on the sharing of benefits, measures such as area-based management tools, including marine protected areas, and environmental impact assessments, capacity-building and the transfer of marine technology.[14] In 2015,[15] on the basis of the recommendations of the final report of the BBNJ WG,[16] UNGA decided to move forward with the development of a new treaty.[17] UNGA decided thus to launch a preparatory committee (PREPCOM) aimed at developing 'elements of a draft text of an international legally binding instrument'.[18] The PREPCOM held four meetings between 2015 and 2017, and submitted its report to UNGA in July 2017. The report

erationalizing Sustainable Development: Ecological Integrity as a Grundnorm of International Law', *Review of European, Comparative & International Environmental Law*, 24:2, 2015, 194.

9 Adaptive management is for example one of the four operational guidelines adopted within the context of the CBD as an annex to the Malawi Principles in Recommendation V/10 on 'Ecosystem approach: further conceptual elaboration', in the Report of the Fifth Meeting of the Subsidiary Body on Scientific, Technical and Technological Advice Montreal, 31 January–4 February 2000, Canada, UNEP/CBD/COP/V/10.

10 Report of the Open-ended Informal Consultative Process on Oceans and the Law of the Sea, 26 June 2003, UN Doc. A/58/95, para 98ss.

11 Resolution adopted by the General Assembly on 17 November 2004, UN Doc. A/RES/59/24, para 73.

12 Letter dated 30 June 2011 from the Co-Chairs of the Ad Hoc Open-ended Informal Working Group to the President of the General Assembly, UN Doc. A/66/119, Annex, Section I "Recommendations", para 1(a).

13 This expression indicates the goal of pursuing the negotiating agenda as a package deal, that is, either there is agreement on all the elements or no agreement at all.

14 Ibid., para 1(b).

15 Resolution adopted by the General Assembly on 9 December 2013, UN Doc. A/RES/68/70, para 198–200, para 198.

16 Letter dated 13 February 2015 from the Co-Chairs of the Ad Hoc Open-ended Informal Working Group to the President of the General Assembly, Annex, Section I "Recommendations", UN Doc. A/69/780, para 1(e) (hereinafter BBNJ WG Recommendations).

17 UNGA Res. A/69/292 'Development of an international legally binding instrument under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction', 19 June 2015.

18 Ibid.

recommended UNGA to convene an intergovernmental conference (even though it did not reflect consensus),[19] and UNGA did launch a formal intergovernmental conference (IGC) on 24 December 2017.[20] The resolution has scheduled four substantive sessions and a preliminary organizational meeting. At the time of writing, the IGC has held the organizational meeting in April 2018, and three substantive sessions. The IGC shall consider the recommendations of the PREPCOM report,[21] which thus remains an important starting point for the IGC negotiations.[22]

### 2.2. The Ecosystem Approach at the PREPCOM

Already during the very early phase, the ICP-7 report recognized that the ecosystem approach would be invaluable to avoid fragmentation,[23] and to 'build a global legal regime that allowed for an integrated assessment of human activities and their interactions with the marine environment'.[24] The BBNJ WG report further recognized that several delegations agreed on the fact that a future agreement should incorporate widely accepted principles of ocean governance, such as the ecosystem approach.[25] It was however the PREPCOM that more concretely recommended that the text of a future ILBI 'would set out the general principles and approaches guiding the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction', and indicated specifically the ecosystem approach among the '[p]ossible general principles and approaches'.[26] The IGC offers further indication as to the potential role of the ecosystem approach in a BBNJ agreement, even though, as we will see, it has not found much room in the debates except indirectly. It is in this respect the PREPCOM phase that provides most relevant documentation (such as submissions, chair's documents, the report), so this sub-section will focus on the PREPCOM, and a shorter, subsequent, sub-section will assess the status of the discussion at the IGC to date.

Ecosystem approaches were from the initial stages of the PREPCOM included as one of the potential 'guiding principles and approaches', both in general and in relation to ABMTs and EIAs more specifically.[27] In the Chair's Overview of PREPCOM II, the ecosystem approach is mentioned twice under the heading 'possible areas of convergence of views' in relation to area-based management tools and cross-cutting issues.[28] This inclusion is not surprising given the traction the concept has gained in international

[19] Report of the Preparatory Committee established by General Assembly resolution 69/292: Development of an international legally binding instrument under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction, 31 July 2017, UN Doc. A/AC.287/2017/PC.4/2, Part III, para 38(a).

[20] UNGA Res. A/RES/72/249 'International legally binding instrument under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction'.

[21] Ibid., para 1.

[22] Statement by the President of the Conference at the closing of the organizational meeting, UN Doc. A/CONF.232/2018/2.

[23] ICP-7, para 79.

[24] ICP-7, para 90.

[25] "Outcome of the Ad Hoc Open-ended Informal Working Group to study issues relating to the conservation and sustainable use of marine biological diversity beyond areas of national jurisdiction and Co-Chairs' summary of discussions", UN Doc. A/69/780, paragraph 22 of the document observed how "[s]everal delegations noted that a legally binding agreement should incorporate widely accepted principles of ocean governance, such as the precautionary principle, integrated ocean management and an ecosystem approach".

[26] PREPCOM Report, Section III, para 1.

[27] Chair's overview of the first session of the Preparatory Committee, respectively p. 5, 9 and 12, http://www.un-.org/depts/los/biodiversity/prepcom_files/PrepCom_1_Chair's_Overview.pdf accessed on 2 December 2018.

[28] Chair's overview of the second session of the Preparatory Committee, Appendix 2 and 5 respectively relating to ABMTs and to cross-cutting issues, http://www.un-

law. What is perhaps surprising is the *dearth* of submissions that do little more than mentioning the ecosystem approach as a suitable guiding principle. These are certainly welcome suggestions, and an important first step. Yet Norway is the only State that has to date indicated its interest in a detailed elaboration of the ecosystem approach in the ILBI. Norway's submission suggests that the ecosystem approach be one of the overall objectives of the ILBI; and that it 'should be clearly defined'.[29] The submission indeed offers a definition derived from the World Summit on Sustainable of Development (WSSD).[30]

The most concrete and interesting suggestion for the inclusion of the ecosystem approach comes from submission of WWF. WWF suggests that the ecosystem approach should be one of the general guiding principles/approaches of the future ILBI, and be included also in the general objectives of the ILBI, something which was taken up by the PREPCOM Chair in its February 2017 Non Paper.[31] However, and importantly, WWF further suggests that the parties should adopt an Annex to the ILBI containing the rules necessary to guide the implementation of the ecosystem approach. The idea is to follow the model of the Fish Stocks Agreement (FSA), where Annex II guides the operationalization of the precautionary approach. The Annex, in WWF's view, should form 'an integral part of the agreement'[32] borrowing again from the FSA, where Article 48 establishes the integral nature of the Annexes to the main agreement.

WWF's submission also considers aspects related to institutional set-up and to the production, gathering and dissemination of scientific knowledge. In this respect, WWF imagines the creation of two bodies. A governing body would, inter alia, serve the role of 'overseeing/supervising the implementation of the implementing agreement, including the operationalisation of ecosystem-based integrated oceans management in areas beyond national jurisdiction'[33]. As scientific and technical subsidiary body would provide 'scientific and technical assistance in operationalising ecosystem-based integrated oceans management at appropriate biogeographic scales'.[34]

Finally, WWF proposes the creation of a clearing-house mechanism or online repository, with the purpose of 'information sharing and dissemination'. This would facilitate implementation of the ecosystem approach by providing continuous and updated biological, ecological and oceanographic information, 'as well as pressures, stressors, activities and uses of the marine space'.[35] This type of information, suggests WWF, and it is difficult to disagree, would be necessary and essential in relation to 'the assessment of cumulative impacts',[36] as well as in relation to various forms of impact assessments, and for the informed development of an effective network of MPAs, and more broadly for ecosystem-based ocean management plans.

During PREPCOM III, the ecosystem approach has only been mentioned indirectly, while referring to other, more central issues (either the agenda items, or the cross-cutting issues). However, themes and questions relevant

.org/depts/los/biodiversity/prepcom_files/Prep_Com_II_Chair_overview_to_MS.pdf accessed 2 December 2018.

[29] Norwegian input December 2016, PREPCOM III, p. 2, http://www.un.org/depts/los/biodiversity/prepcom_files/rolling_comp/Norway.pdf, accessed 2 December 2018.

[30] Ibid., p. 2.

[31] Chair's non-paper on elements of a draft text of an international legally-binding instrument under UNCLOS, p. 13, http://www.un.org/depts/los/biodiversity/prepcom_files/Chair_non_paper.pdf, accessed 28 November 2018.

[32] WWF Submission, p. 2.

[33] WWF Submission, p. 9.

[34] WWF Submission, p. 10.

[35] WWF Submission, p. 10.

[36] WWF Submission, p. 10.

for the ecosystem approach, and for understanding how the ecosystem approach may in fact be included in the new BBNJ agreement, were aired in multiple occasions, especially in relation to environmental impact assessments.

Both the February 2017 Chair's non-paper and the Streamlined Chair's non-paper, which summarizes the former, prepared respectively prior to PREPCOM III and PREPCOM IV to assist delegations, include the definition provided by WWF.

Ecosystem-based management means an integrated approach to management that considers the entire ecosystem, including all stakeholders and their activities, and resulting stressors and pressures with direct or indirect effects on the ecosystem under consideration, The goal of ecosystem-based management is to maintain or rebuild an ecosystem to a healthy, productive and resilient condition, through, inter alia, the development and implementation of cross-sectoral ecosystem-level management plans'[37]

It is useful to note that the definition (like the one offered by Norway) refers to 'ecosystem-based management', rather than to ecosystem approach, something which is important and which I will return to later. The ecosystem approach is also included as guiding principle and/or approach under two agenda items, EIAs and MPAs. The extent of the inclusion of the ecosystem approach in the PREPCOM report, finally, which forms the substantive platform for the IGC negotiations, is limited to its being one of the possible guiding principles and/or approaches the ILBI 'could include'.[38]

[37] Chair's streamlined non-paper on elements of a draft text of an international legally-binding instrument under UNCLOS, p. 6, http://www.un.org/depts/los/biodiversity/prepcom_files/Chairs_streamlined_non-paper_to_delegations.pdf, accessed 28 November 2018.

[38] PREPCOM Report, Section III/1, p. 11.

### 2.3. The Ecosystem Approach at the IGC

The IGC has reached its half point, with two of the four substantive sessions already having been held. Prior to the substantive meetings, a preliminary and organizational meeting was held in April 2018. This organizational meeting was important in many respects, and especially for the election of the President of the IGC, Ambassador Rena Lee, which has so far proved to be a very significant choice. During the first substantive session of the IGC, held in September 2018, progress has been on the other hand made, at least on a number of points, not in small part thanks to the document prepared by the President, upon request of the Conference, to aid discussions and keep them structured and focused.[39] However, many delegations referred back to their PREPCOM submission, and general the PREPCOM report was the initial platform for the discussions. Accordingly, not much progress has been made with respect to the ecosystem approach, which was mentioned to be sure by a number of delegations as one of the necessary guiding principles, both in general, and in relation to specific topics such as area-based management,[40] environmental impacts assessments,[41] or marine genetic resources.[42] While IGC-1 was a preliminary step, as much of the discussions took the form of exchange of views, expectations for IGC-2 were high. IGC-1 had given President

[39] IGC President, Rena Lee, 'President's aid to discussions", UN Doc. A/CONF.232/2018/3.

[40] Thus e.g. the interventions of the EU, Switzerland and Senegal of 7 September 2018 in relation to agenda item 4.1 of the President's aid to discussions ("Objectives of area-based management tools, including marine protected areas"), personal notes.

[41] Thus e.g. the interventions of Egypt of 11 September 2018 in relation to agenda item 5.8.3 of the President's aid to discussions ("General principles and approaches"), personal notes.

[42] See e.g. Statement by the President of the conference at the closing of the first session, UN Doc. A/CONF.232/2018/7, p. 21.

Rena Lee mandate for producing a document that should enable IGC-2 to shift focus. Delegations would no longer simply exchange of views but would engage in text-based (or at least text-led) negotiations. This document, called Aid to Negotiations,[43] included, in accordance with the mandate received at IGC-1, all existing options. The pace of progress at IGC-2 however has been at best ambiguous. While some delegations remained optimistic,[44] others were appalled by the lack of progress, especially on key issues.[45] The ecosystem approach did not receive particular attention at IGC-2,[46] while its inclusion in the Aid to Negotiations merely reflected earlier documents and was rather limited.[47]

However, some of the key elements of an ecosystem approach were discussed individually across the negotiating agenda. For example, in the context of the working group on environmental impact assessments (EIAs), the question of when an assessment would be required attracted much debate. Some delegations argued that any EIAs rules adopted in the ILBI should only be applicable to activities that take place in ABNJ (the activity-oriented approach); others by contrast insisted that every activity that has impacts on ABNJ should be covered by the EIAs rules (the impact-oriented approach). This is clearly an important question from the perspective of an ecosystem approach, to the extent that in one case the legal framework would be inclusive and cut across maritime zones, and in the other it would remain constrained by jurisdictional lines. It must be noted however, that already today UNCLOS sets out obligations to carry out impact assessments for any activities under the jurisdiction and control of a State regardless of where the impacts may occur, so a limitation in the ILBI would arguably run counter the general principles already enshrined in UNCLOS.[48] A second example that further illustrates how, even if explicit discussion on the ecosystem approach was lacking, some of its elements have been discussed individually under different items, relates to cumulative impacts. Cumulative impacts were discussed especially in relation to EIAs and ABMTs. The importance of the concept of cumulative impacts, which is a crucial element of the ecosystem approach, was concisely expressed by the delegation of the Federate States of Micronesia, which observed how

[43] President's Aid to Negotiations, UN Doc. A/CONF. 232/2019/1, https://undocs.org/A/CONF.232/2019/1.

[44] United Nations Meetings Coverage and Press Releases, "Delegates Hail Positive Progress on New High Seas Treaty, as Second Session of Intergovernmental Negotiations Concludes", 5 April 2019, https://www.un.org/press/en/2019/sea2102.doc.htm.

[45] Some indeed expressed outright frustration at what they felt was a pervading sense of *déjà vu*, and there was a sense that on some key issues positions remained "diametrically opposed", respectively ENB, "BBNJ IGC-2 Highlights: Monday, 25 March 2019", Vol. 25 Number 186, p. 2 (hereinafter ENB 25 March) p. 2 and ENB, Summary of the Second Session of the Intergovernmental Conference on an International Legally Binding Instrument under the UN Convention on the Law of the Sea on the Conservation and Sustainable Use of Marine Biodiversity of Areas Beyond National Jurisdiction: 25 March–5 April 2019, Vol. 25 Number 195 (hereinafter ENB Summary), p. 18.

[46] IGC-2 indeed focused mostly on "the mechanisms to be built, the processes to be developed and the roles of the various actors", Intergovernmental conference on an international legally binding instrument under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction Second session, 25 March – 5 April 2019 Statement by the President of the conference at the closing of the second session, p. 3, https://www.un.org/bbnj/sites/www.un.org.bbnj/files/bbnj_-_igc2_-_presidents_closing_statement_-_advance_unedited_version.pdf.

[47] And it was limited to inclusions in the list of possible general principles and approaches for the whole ILBI (air to negotiations, p. 8) or in relation to area-based management tools and environmental impact assessments (ibid. respectively p. 9 and 10), as one of the possible principles and approaches guiding benefit-sharing (ibid. p. 16), and as a reference for the designation of marine protected areas (ibid. p. 27).

[48] UNCLOS, artt. 204-206.

it is not possible to conserve ocean biodiversity without taking into consideration cumulative impacts.[49] Many of the reference to the need to include explicit mention of the concept in the ILBI related to the debate on strategic environmental assessment, which remains at this point very much an open question. For our purposes however, the point to be made is that, while the ecosystem approach has not been discussed organically or systematically, some of its constituent elements have been. The main question then is whether these separate discussions may lead to a coherent articulation of an ecosystem approach in the ILBI. The answer is probably that one such outcome is unlikely without fully articulating an explicit framework. An important consideration in this respect is that debates on these points are still open and while some positive convergence existed on cumulative impacts (with some notable exceptions),[50] significant resistance remained in relation to the scope of EIAs, to strategic environmental assessment and to inclusive ecosystem-oriented language on the part of key delegations.

As the IGC-2 drew to a close, delegations considered the way forward, and agreed that the President should prepare a document that would enable text-based negotiations. Such a document, which would need to take into account the various proposals made during IGC-2, "would likely be structured in a form more akin to a treaty, and containing treaty language".[51] The document circulated by the President at the end of June 2019 was accordingly a draft treaty text "aimed at streamlining the options contained in the President's aid to negotiations, including, inter alia, by merging options where possible".[52] Additionally, the draft document was structured like a treaty and "contains treaty language with provisions addressing each of the four topics identified in the package agreed in 2011, as well as cross-cutting issues".[53]

Importantly, the President emphasized in the note accompanying the draft text, that while "efforts were made to take into account the views expressed and proposals made during the first two sessions of the Intergovernmental Conference, not every delegation's preferred option or language may be reflected in the text".[54] The President also underlined, that in some cases "new language has been proposed in the light of suggestions made during the discussions and drawing from the provisions of existing instruments", with the goal of offering a way forward.[55]

To further facilitate the shift in negotiating modus, the working method included scheduling so-called informal informals meetings. These were smaller and less formal meetings than the informal working group, and were meant to facilitate more focused and open negotiations that should allow easier bridging of existing gaps. To this end, access to these meetings was also restricted for observers,[56] in order to maintain confidentiality and ensure an environment conducive to frank and productive negotiations.

What is most interesting for our purposes is that the ecosystem approach no longer appeared in the tentative list of general principles and

[49] Federated States of Micronesia, 28 March 2019, personal notes.

[50] Such as China, April 1 2019, personal notes.

[51] Statement by the President of the conference at the closing of the second session, A/CONF.232/2019/5, p. 2.

[52] Draft text of an agreement under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction, UN Doc. A/CONF.232/2019/6, para 6.

[53] Ibid., para 5.

[54] Draft text, para 6.

[55] Ibid.

[56] IGOs and NGOs were assigned up to 5 seats each for each informal informal. Each group would negotiate internally how to allocate among the different organizations.

approaches contained in draft article 5.[57] However, the text mentions an integrated approach (or principle),[58] but it is not clear whether and to which extent that may also include or make reference to the ecosystem approach. The discussion on draft article 5 on general principles and approaches took place in two steps. First the President sought comments on the exiting list. Noteworthy in this respect is the intervention from Japan, which observed how the list has never been discussed fully in the IGC, and pointed out how there are more important principles (including the ecosystem approach) that have disappeared.[59] Subsequently the President opened the floor for interventions on which additional principles should be added to the list. It appeared clear at this point that there was widespread support among delegations for the inclusion of a specific reference to the ecosystem approach,[60] something which had already been remarked upon by Eritrea.[61]

Outside of this convergence of views as to the inclusion of the ecosystem approach in the list under article 5, no substantive discussion took place, with the exception of an interesting remark by Eritrea, which observed that if the ILBI is to adopt an ecosystem approach, there will be a need to ensure a uniform application of UNCLOS to all resources – as maritime zones are inseparable ecosystems.[62] The intervention was in relation to draft article 9 on "Activities with respect to marine genetic resources of areas beyond national jurisdiction", but it is interesting as it has been the only intervention during the IGC-3 that has explicitly problematized the misalignment between an ecosystem perspective and the jurisdictional boundaries enshrined in UNCLOS.[63]

It is finally useful to note how, like during IGC-2, some of the key elements of an ecosystem approach were discussed individually across the negotiating agenda. On these elements however, no consistent progress could be detected in IGC-3. For example, while there was "consensus" on the need to include cumulative impacts in the conduct of EIAs, albeit the modalities of this inclusion still require significant discussion, and no convergence exist yet on whether to include explicit reference to climate change and ocean acidification.[64] Additionally, no clear agreement still exist on whether the ILBI should adopt an impact-oriented or an activity-oriented approach,[65] and the question of SEA, which is in many ways crucial for an effective implementation of the ecosystem approach, remains in need of much discussion.[66]

The ecosystem approach is also mentioned in Part II of the draft text on the topic of "Measures Such As Area-Based Management Tools, Including Marine Protected Areas", and more specifically in article 16 on the "Identification of areas requiring protection" and in article 17

[57] Draft text, draft article 5, p. 7.
[58] Ibid.
[59] Japan, IGC-3, 28 August, 2019, personal notes.
[60] IGC-3, 28 August 2019, 3–6 p.m., Informal working group on cross-cutting issues, personal notes. See also Earth Negotiations Bulletin, *Summary of the Third Session of the Intergovernmental Conference (IGC) on the Conservation and Sustainable Use of Marine Biodiversity of Areas Beyond National Jurisdiction: 19–30 August 2019*, Vol. 25 No. 218, Monday, 2 September 2019 (hereinafter ENB Summary IGC-3), p. 9.
[61] Eritrea, IGC-3, 28 August 2019, personal notes.
[62] Eritrea, IGC-3, 28 August 2019, personal notes.
[63] However, commentators have pointed out the need to harmonize legal regimes across jurisdiction, see in particular J. Mossop, 'Towards a Practical Approach to Regulating Marine Genetic Resources', 8:3 ESIL Reflections, 2019. It is also to be noted that Eritrea's intervention aimed at mobilizing the ecosystem approach to support the need to include MGRs under the common heritage of mankind regime, see ENB Summary IGC-3, cit., p. 7.
[64] ENB Summary IGC-3, p. 11.
[65] With both approaches getting some support, as the facilitator Lefeber reported from the informal informal on EIAs, ENB Summary IGC-3, p. 11.
[66] Ibid.

on "Proposals".[67] The ecosystem approach is identified therein respectively as one of the basis to use for the identification of areas requiring protection and as one of the bases for the proposals.[68] A final mention is contained in article 21 on "Monitoring and Review", where the ecosystem approach is indicated as one of the bases for proposing amendments or revocations of an ABMT.[69]

## 3. Ecosystem Approaches in International Law

### 3.1. Introduction

While there is convergence on the inclusion of the ecosystem approach in a future ILBI, there remains at this stage a conspicuous lack of details, and only two PREPCOM submissions argued a definition was necessary and offered suggestions in that sense. This raises some problems, as simple reference to the ecosystem approach does not reveal what sort of role it may have in a future ILBI. The most significant problem is that such an approach entails the assumption that the ecosystem approach is easily identifiable (if not definable) outside of the ILBI. However, the ecosystem approach is affected by important ambiguities that render its delineation problematic.[70] This consideration reflects the fact that the ecosystem approach, notwithstanding the general elements outlined in sub-section 1.1, is stretched between competing narratives, is the result of a complex set of contingencies and contestations,[71] and has been developed in different ways in different contexts, so that it is perhaps best to speak of ecosystem approaches in the plural. Additionally, failing to delineate with sufficient clarity and precision what an ecosystem approach entails is likely to make its operationalization very difficult. Hence, the meaningful integration of the ecosystem approach in the ILBI is to a significant degree dependent on the modality of its inclusion. To further complicate matters, the PREPCOM documents and submissions do not offer a consistent terminology (a potentially important fact, given that different terms may also entail a significant conceptual difference).[72]

So, if the ecosystem approach is not defined and delineated in the ILBI, its scope, content and operational details must be drawn from elsewhere, but where?

### 3.2. Searching for the Ecosystem Approach in UNCLOS: Methodological Perspectives

While there is a great variety of reference points and normative clusters that deploy the concept and framework of the ecosystem approach, UNCLOS remains the overarching legal framework for the governance of the oceans as well as the explicit normative reference for the IGC.[73] The focus should be thus in the first instance on UNCLOS.

However, UNCLOS was negotiated and adopted prior to the ecosystem approach be-

[67] Though Canada suggested that the reference to the ecosystem approach (as well as the other principles mentioned in the provisions) be rather moved to the general part of the agreement, ENB Summary IGC-3, p. 8.

[68] Ibid., draft article 16 and 17, p. 15.

[69] Ibid., draft article 21, p. 20.

[70] See e.g. V. De Lucia, 'Competing Narratives and Complex Genealogies: The Ecosystem Approach in International Environmental Law', 27:1 Journal of Environmental Law, 2015, 91.

[71] Ibid. and esp. V. De Lucia, *The Ecosystem Approach in International Environmental Law. Genealogy and Biopolitics*, Routledge 2019a.

[72] See on this point De Lucia 2015 op. cit. and De Lucia 2019a op. cit. However, the terminological differences may simply have been introduced inadvertently on the part of the delegations.

[73] The mandate of the IGC is in fact delimited by language that requires the new treaty, its implementation as well as the process leading to it, to be consistent with UNCLOS, see UN Doc. A/RES/72/249.

coming the important and widely adopted framework that it is today, hence there is no direct indication or mention of the ecosystem approach in UNCLOS provisions. However, there is a question of whether UNCLOS includes the ecosystem approach based on a number of considerations, such as its framework character and the open-ended nature of its provisions. From this perspective, UNCLOS provisions included in Part XII, and especially article 192, can and should be interpreted so as to adapt to new norms and circumstances,[74] including importantly the entire 'corpus of international law relating to the environment',[75] of which the ecosystem approach is part. With this consideration in mind, this sub-section will address from different angles the question of whether the ecosystem approach is, or can be, included in UNCLOS. The following subsection will in turn offer a brief overview of how the ecosystem approach is articulated in other ocean or environmental legal regimes also relevant for the BBNJ process.

As mentioned, the negotiation and adoption of UNCLOS predates the rise of the ecosystem approach in international law. However, a number of scholars suggest that UNCLOS already contains, at least in implicit and precursory ways, an ecosystem approach to marine environmental protection and to fisheries management.[76] Based on this existing scholarship, and on the broader scholarship on the ecosystem approach, I suggest it is possible to approach the relationship between the ecosystem approach and UNCLOS (and more generally any legal regime) by way of two different routes: the ecosystem route, and the essential equivalence route.[77]

The *ecosystem* route takes a formal approach and starts from the fact that the ecosystem approach is fundamentally linked to the concept of ecosystem. From this perspective, any environmental regime that deploys the concept of ecosystem from which specific legal consequences can be drawn, can be characterized as taking an ecosystem approach. This perspective leads some commentators to see the ecosystem approach in a wide variety of regimes not only directly or explicitly, but also implicitly and indirectly. The ecosystem approach is thus at work, for example, in the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR);[78] in the UN Fish Stock Agreement;[79] in the UN Convention on the Law of the Non-Navigational Uses of International Watercourses (Watercourses Convention);[80] and in the Agreement on the International Dolphin Conservation Program.[81] UNCLOS is also considered by some scholars,[82] as we shall see presently.

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[74] ICJ, *Gabcikovo-Nagymaros*, Judgment, ICJ Reports 1997, esp. paras 112 and 140.

[75] PCA, Philippines v. China, 2013/19, para 941.

[76] See e.g. M. Besky, 'Using Legal Principles to Promote the "Health" of an Ecosystem', *Tulsa Journal of Comparative and International Law*, 3, 1995, 183; J. Morishita, 'What is the ecosystem approach for fisheries management?', *Marine Policy*, 32, 2008, 19; A. Fabra and V. Gascón, 'The Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR) and the Ecosystem Approach', International Journal of Marine and Coastal Life, 23, 2008, 567; H. Wang, 'Ecosystem Management and Its Application to Large Marine Ecosystems: Science, Law, and Politics', *Ocean Development & International Law*, 35:1, 2004, 41.

[77] This is part of a larger analytical framework that I have articulated in full in De Lucia, 2019a, op. cit., esp. chapter 4.

[78] Fabra and Gascón, 2008, op. cit.

[79] See e.g. E. Metzer, The Quest for Sustainable International Fisheries. Regional Efforts to Implement the 1995 United Nations Fish Stock Agreement, Ottawa: NRC Research Press, 2009.

[80] See e.g. O. McIntyre, 'The Emergence of an "Ecosystem Approach" to the Protection of International Watercourses Under International Law', *Review for European, Comparative and International Environmental Law*, 13:1, 2004, 1.

[81] Thus Y. Tanaka, A Dual Approach to Ocean Management. The Cases of Zonal and Integrated Management in International Law, Aldershot: Ashgate, 2008, p. 78.

[82] Thus e.g. Belsky, 1995, op. cit.; Morishita, 2008, op. cit.; Wang, 2010, op. cit.

There is, however, a second, yet in many ways overlapping, route that I call the *essential equivalence* route. This route takes a substantive approach, as it reads the ecosystem approach into legal regimes based on whether a particular regime *essentially* or *effectively* incorporates an ecosystem approach, even if there is no formal deployment of the concept or language of ecosystem. This implicit inclusion can be inferred from 'broad consideration of biodiversity and the importance of the natural environment and its related functions and services'.[83] In this respect, the ecosystem approach is read into UNCLOS,[84] the Ramsar Convention[85] and CITES.[86] FAO also follows a 'substantive' line of reasoning, and takes the view that while the specific language of the ecosystem approach 'may not yet be common in international instruments, regional conventions or arrangements and national legislation, the underlying principles and conceptual objectives examined above appear in many of them'.[87]

[83] Metzer, 2009, op. cit., p. 144. Metzer lists in this respect the Convention on Wetlands of International Importance especially as Waterfowl Habitat of 1971, the Convention on International Trade in Endangered Species of Wild Flora and Fauna of 1973 and the Bonn Convention on the Conservation of Migratory Species of Wild Animals of 1979.

[84] Thus e.g. Morishita 2008, op. cit.

[85] C. Finlayson *et al.*, 'The Ramsar Convention and Ecosystem-Based Approaches to the Wise Use and Sustainable Development of Wetlands', *Journal of International Wildlife Law & Policy*, 14:3/4, 2011, 176, p. 191.

[86] D. Currie, Ecosystem-Based Management in Multilateral Environmental Agreements: Progress towards Adopting the Ecosystem Approach in the International Management of Living Marine Resources, WWF, 2007, p. 39, http://assets.panda.org/downloads/wwf_ecosystem_paper_final_wlogo.pdf, accessed 20 November 2018.

[87] S. Garcia et al., *The Ecosystem Approach to Fisheries: Issues, Terminologies, Principles, Institutional Foundations, Implementation and Outlook*, FAO Fisheries Technical Paper 443, Rome: Food and Agriculture Organization of the United Nations, 2003, p. 6, p. 15. Thus also T. Aqorau, 'Obligations to protect marine ecosystems under international conventions and other instruments' in M. Sinclair and G. Valdimarsson (eds) *Responsible fisheries in the marine ecosystem*, Wallingford, UK and Cambridge, MA: FAO and CAB International, 2003.

### 3.3. The Ecosystem Approach in UNCLOS

Having presented some relevant methodological aspects, we can now turn to UNCLOS. Starting with the ecosystem route, some scholarship reads the incorporation of an ecosystem approach in UNCLOS based on the inclusive language used to qualify the duties of States to protect the marine environment. In particular, the term environment includes, under UNCLOS 'rare and fragile ecosystems as well as habitat of depleted, threatened or endangered species and other forms of marine life',[88] a formulation which, Belsky argues, implies an ecosystem orientation.[89] Similarly Morishita considers that sufficient evidence of the ecosystem approach being included in UNCLOS is offered by the use of the term 'ecosystem' in the language of the Convention.[90]

However, it is the essential equivalence route that promises to be the most fruitful approach. Indeed, despite the fact that UNCLOS is 'conspicuously silent about the ecosystem approach',[91] it is possible to infer its implicit inclusion from the particular language utilized in some articles. There are at least four ways that can lead to reading the ecosystem approach into UNCLOS through the essential equivalence route. First, the notion of the interdependence of species (e.g. art. 119 and 61) may be taken to represent the concept of the ecosystem approach at the time.[92] Secondly, mention of the effects that human activities may have 'on species associated with or dependent upon harvested species'

[88] United Nations Convention on the Law of the Sea, Montego Bay, 10 December 1982, entered into force on 16 November 1994, (1982) 21 International Legal Materials 1261 (UNCLOS), Article 194(5).

[89] Thus Belsky, 1995, op. cit.

[90] Morishita, 2008, op. cit.

[91] Morishita, 2008, op. cit., p. 20.

[92] Ibid.

(art. 194) may also be considered to entail, essentially, an ecosystem approach. Third, article 192, as an integrative norm encompassing all aspects of the marine environment and all maritime zones can also be said to effectively express the key elements of the ecosystem approach. Fourth, and finally, article 192 also opens for the inclusion of more recent principles of international environmental law in UNCLOS,[93] including arguably the ecosystem approach itself.

Scholars have made use of all of these options. Belsky for example has made a strong case in this respect already in 1995, when he maintained, in a detailed analysis, that the evolution of the ecosystem approach 'from preferred policy to binding custom' is 'demonstrated' by UNCLOS.[94] He observed that under UNCLOS all Parties have an obligation to 'preserve and protect the marine environment',[95] and to 'manage their resources based on the interdependence of species'.[96] Belsky further suggests that 'specific management principles of [UNCLOS] provide for a *comprehensive ecosystem approach*'.[97] Even MSY, whose central role in UNCLOS could militate against an ecosystem orientation, Belsky argues, is 'qualified by 'other relevant environmental and economic factors' and [shall] take into account the 'interdependence of stocks'.[98] In conclusion and recalling that the provisions of UNCLOS must be read as a whole, Belsky claims with confidence that UNCLOS 'mandates the ecosystem approach'.[99]

Others make similar arguments. Aqorau considers UNCLOS to be one of the 'international instruments that specifically 'apply the ecosystems approach to fisheries management'.[100] Morishita refers to the use of formulations such as 'relevant environmental and economic factors' used to qualify the use of MSY (art. 119), 'the interdependence of stocks' (art. 119) and 'the effects on species associated with or dependent upon harvested species' (art. 194).[101] Article 119 in particular, contends Morishita, while 'not using the term, represents the concept of the ecosystem approach at the time of the conclusion of the negotiations for UNCLOS'.[102] Others, further, encourage accepting the opinion of those scholars that, while acknowledging that UNCLOS does not explicitly incorporate the ecosystem approach, recognize that the latter 'coincides with the spirit and objectives of UNCLOS'.[103] Moreover, it is suggested, UNCLOS is supportive of the ecosystem approach (and especially of the more specialized articulation known as ecosystem approach to fisheries)[104] through a multiplicity of provisions, which 'embrace', if only to an extent, some of the attributes of the ecosystem approach.[105]

It is thus clear that there are ways to infer an ecosystem orientation, if not a full-fledge ecosystem approach, in UNCLOS. Such inference may be useful for the effective inclusion of the ecosystem approach in the future BBNJ agreement. However, while it is possible to read the ecosys-

[93] See e.g. PCA, Philippines v. China, para 941.
[94] Belsky, 1995, op. cit., p. 194.
[95] Article 192 UNCLOS; Belsky further refers to articles 194, 197, 207, 207, 210.
[96] Belsky, 1995, op. cit., p. 195; Belsky refers to articles 61, 63, 64, 65, 66, 67.
[97] Ibid., p. 195, footnote 81, emphasis mine.
[98] Ibid., p. 195, footnote 81.
[99] Ibid., p. 196. For a contrary opinion see however W. Burke, 'Compatibility and Protection in the 1995 Straddling Stock Agreement' in H. Scheiber (ed.) *Law of the Sea: The Common Heritage and Emerging Challenges*, Leiden: Martinus Nijhoff Publishers, 2000, pp. 125–126.
[100] Aqorau, 2003, op. cit.
[101] For a fuller discussion see Morishita, 2008, op. cit., p. 20.
[102] Ibid., p. 20.
[103] Wang, 2010, op. cit. p. 48.
[104] On the ecosystem approach to fisheries see FAO 2003.
[105] Ibid., p. 48. Similarly E. Kirk, 'The Ecosystem Approach and the Search for An Objective and Content for the Concept of Holistic Ocean Governance', *Ocean Development and International Law*, 46:1, 2015, 33, p. 40.

tem approach into UNCLOS through these two methodological pathways, it is also important to underline that the ecosystem approach remains at best implicit in UNCLOS, and at worst entirely alien to it. Moreover, the concept does not offer any systematic or detailed blueprint that the BBNJ agreement may refer to, which in turn means that a simple reference to the ecosystem approach is by no means sufficient if one is to understand what is meant and what legal consequences such inclusion among the guiding principles and/or approaches may have.

### 3.4. The Ecosystem Approach in the Broader International Legal Context

It is at this point useful to offer a brief overview of other articulations of the ecosystem approach within the context of other relevant international regimes. These on the one hand define the key elements of the ecosystem approach in their different contexts. On the other, they define also the relationship between the ecosystem approach and other conservation tools (such as marine protected areas) that provide the context for the invocation of the ecosystem approach in the BBNJ process, or principles (such as the precautionary principle) mentioned alongside the ecosystem approach as potential guiding principles and/or approaches.

In relation to Oceans, ecosystem approaches (in the plural) became a 'theme' following the WSSD, which encouraged States to apply the ecosystem approach by 2010.[106] UNGA resolution A/RES/60/30 subsequently requested the United Nations Open-ended Informal Consultative Process (ICP) on Oceans and the Law of the Sea to focus one of its sessions (the seventh) on 'ecosystem approaches and oceans'.[107] ICP-7's report, while recognizing that there was no single way to conceptualize and implement the ecosystem approach, arrived at a set of 'agreed consensual elements'. These included, inter alia, conservation of ecosystem structures and their functioning and key processes in order to maintain ecosystem goods and services; the balancing of diverse social objectives; the use of best available knowledge; participatory governance; precaution; the appropriate balance between, and integration of, conservation and sustainable use of marine biological diversity. The ICP-7 report also includes a second set of elements 'for the improved application of an ecosystem approach', such as, inter alia: identification of ecologically based management areas; assessment of ecosystem health and indicators; adaptive management; ecosystem monitoring; and addressing the 'root causes' of ecosystem degradation.

FAO has also carried out important work in relation to the ecosystem approach to fisheries.[108] However, the question of whether and to which extent fisheries will be included within the scope of the international legally binding instrument (despite the fact that fisheries is perhaps the global legal field where most initiatives are taken to address the protection of marine biodiversity)[109] remains unanswered at this point. For this reason, I will not discuss this further, except to mention one significant point that illustrates two key issues when discussing the ecosystem approach. First, FAO distinguishes between an ecosystem-based management, which it consid-

[106] Report of the World Summit on Sustainable Development Johannesburg, South Africa, 26 August–4 September 2002, para 30(d).

[107] Report on the work of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea at its seventh meeting, New York, 12–16 June 2006, UNDOC/A/61/156, 2006.

[108] FAO 2003, op. cit.

[109] T. Henriksen, 'Conservation and Sustainable Use of Arctic Marine Biodiversity: Challenges and Opportunities', *Arctic Review on Law and Politics*, 1:2, 2010, 249, p. 262.

ers an important shift in management paradigm, and the ecosystem approach (to fisheries), which it considers by contrast to represent a continuous development from existing management practices.[110] Secondly, this also illustrates the potential importance of utilizing precise and deliberate terminology, which is not the case today in the BBNJ interventions which use at least three formulations: ecosystem approach (the most common one), ecosystem-based management (used for example by WWF, as noted) and ecosystem management.[111]

The CBD early on adopted the ecosystem approach as 'the primary framework of action to be taken under the Convention'[112]. The CBD however has made clear that the ecosystem approach does not possess a legally binding character, but is rather intended to offer a framework of 'flexibility and experimentation' in the implementation of the substantive obligations under the CBD, with a view to achieve the 'integrated management of land, water and living resources'.[113] The CBD has also endorsed a set of 11 principles known as the Malawi Principles[114] that, while subsequently refined and elaborated,[115] remain an important reference point for any discussion of the ecosystem approach, as indeed evident also from the CBD's intervention during IGC-1.[116]

The OSPAR Convention on the protection of the marine environment of the North-East Atlantic[117] also offers an important reference point, particularly its Annex V, relating to the protection of biodiversity. The ecosystem approach is an important tool within OSPAR, which has also pioneered work on the development of ecological quality objectives which serve as important tools for the actual monitoring of ecosystems and for the implementation of the ecosystem approach.[118]

These elements all represent important reference points in relation to the articulation of the ecosystem approach within an international legally binding agreement. However, as I have shown at length elsewhere, they do not speak of the same ecosystem approach.[119] The question then, is how the ecosystem approach should be considered, included and articulated in a future BBNJ agreement so as to make a difference.

## 4. Integrating the Ecosystem Approach in the BBNJ Agreement. Risks and Opportunities

In light of these complexities, how should we regard and understand the very limited inclusion of the ecosystem approach in the BBNJ process? What *should be* the role of the ecosystem approach in the new BBNJ agreement? Is the inclusion of the ecosystem approach merely a rhetorical gesture, destined to populate the preambular and/or non-operative sections of the ILBI? If the intention by converse is the effective operationalization of the concept, are the current mentions sufficient for that purpose? How

[110] FAO 2003, op. cit., p. 2.
[111] For a detailed analysis of these terminological and conceptual differences see De Lucia, 2015, op. cit. and De Lucia, 2019a, op. cit.
[112] Decision II/8 1995.
[113] Decision V/6 2000.
[114] Ibid. The Principles also include four operational guidelines.
[115] Decision VII/11, 'Ecosystem Approach', 9–20 February 2004, Kuala Lumpur, Malaysia, UNEP/CBD/COP/DEC/VII/11.
[116] Statement by the Secretariat of the Convention on Biological Diversity, 5 September 2018, http://papersmart.unmeetings.org/media2/19408163/scbd-statement-general-exchange-delivered-5-sept-morning-.pdf accessed 26 November 2018.
[117] Convention For The Protection Of The Marine Environment Of The North-East Atlantic (OSPAR Convention), 32 ILM 1069, (1993).
[118] OSPAR Commission, The OSPAR System of Ecological Quality Objectives for the North Sea. Towards Assessing Ecosystem Health, Update 2010.
[119] De Lucia 2015, op. cit.; De Lucia 2019a, op. cit.

should the ecosystem approach be articulated to ensure it plays a significant and effective role for marine biodiversity governance of areas beyond national jurisdiction? Even if the ecosystem approach is already part of UNCLOS, by way of one of those interpretative methods outlined in the previous section, what does this consideration add? How does that help define the relevant elements and the operational aspects of the ecosystem approach in the future ILBI?

A mere mention will possibly only defer the 'negotiation' over its implications as one of the guiding principles and/or approaches in a future agreement (including the distinction between principle and approach, which echoes the long struggle over the concept of precaution).[120] Thus, simple reference would not make much difference and may become a lost opportunity. However, even if a definition is included the ILBI, will it be sufficient? Given the multiplicity of possible articulations and orientations, definitions are likely to remain vague, over-inclusive and generally rather susceptible of contrasting emphases and interpretations, particularly in relation to their operationalization. Moreover, all definitions, as a classic Roman brocard warns, are easily subverted.[121]

From a substantive perspective, some elements of an ecosystem approach are being negotiated, and will be included at least to some degree, under the different negotiating items (e.g. EIAs, as mentioned in section 2.3). However, the question remains as to whether this will be sufficient to give the ILBI a coherent ecosystem orientation, and indeed, it seems unlikely.[122]

One interesting way to effectively include the ecosystem approach in a future ILBI is outlined by the WWF submission reviewed in section 2.2, whose key suggestion is to adopt an Annex to the agreement where to set extensive operational rules and parameters. One such Annex, it can be added, could also include a clear reference to one of the existing frameworks setting out the key elements of the ecosystem approach to reduce ambiguities. The Malawi Principles come to mind, given their biodiversity focus. However, perhaps more relevant in an ocean governance context are the ICP-7's report and the work done within the context of OSPAR and FAO. This is not the place to review these elements in details and it is sufficient to emphasize how such a list of elements would help concretize the particular articulation of the ecosystem approach the ILBI will adopt and would also focus the discussion on more specific operational rules. For example, a definition of ecological integrity, maybe along the lines of the CCAMLR could prove very useful. CCALMR to be sure, does not define ecological integrity explicitly. However, the meaning of the concept can be evinced from one of CCAMLR's objectives, namely the 'prevention of changes or minimization of the risk of changes in

[120] See e.g. J. Peel, 'Precaution – a Matter of Principle, Approach or Process?', *Melbourne Journal of International Law*, 5, 2004. This debate is still alive also in the IGC, as evident by the many submissions in this regard during IGC-3, suggesting to replace precautionary principle with precautionary approach, see Conference Room Papers (CRPs) A/CONF.232/2019/ABMT/CRP.7 (Canada, Turkey and New Zealand), A/CONF.232/2019/ABMT/CRP.6 (Core Latin American Countries) and A/CONF.232/2019/ABMT/CRP.5 (PSIDS) and A/CONF.232/2019/ABMT/CRP.1 (USA).

[121] D. 50.17.202 (Iav. l. 11 epist.), Iavolenus – sourced from E. Bianchi, 'Realtà, miti, finzioni in Santi Romano. Osservazioni 'frammentarie' di un romanista' 3 JusOnline 2017.

[122] This also links to the vexed question of the relation between the ILBI and existing global, regional and sectoral bodies and institutions, and the vexed question of the meaning of "not undermining", see V. De Lucia, 'Rethinking the Conservation of Marine Biodiversity beyond National Jurisdiction – From 'Not Undermine' to Ecosystem-Based Governance', 8:4 ESIL Reflection 2019b, https://esil-sedi.eu/esil-reflection-rethinking-the-conservation-of-marine-biodiversity-beyond-national-jurisdiction-from-not-undermine-to-ecosystem-based-governance/.

the marine ecosystem which are not potentially reversible over two or three decades'.[123] However, since the devil is in the detail, and considering how the ecosystem approach can and does take many forms, regardless of the level of detail that the relevant operational guidance contains, the key will be the actual rules adopted to ensure its effective implementation, including for example whether there will be any reference to ecological quality objectives or other concrete, measurable thresholds and conditions.

There are also some points related to integration that bear mentioning, as they are arguably critical and should be addressed explicitly in a future agreement. An important consideration in this respect is the unit of management. If the unit of managements are geographical and ecological areas, then the ecosystem approach poses important challenges that should be addressed openly, in a way that mirrors the concerns over adjacency coastal States have raised during the PREPCOM and IGC so far.[124] Furthermore, the ecosystem approach is already in principle operational in domestic marine spaces. It is also operational within the context of many international institutional and legal regimes and is an important policy instrument in international fisheries law. It is included in most regional fisheries management organizations (RFMOs), and is arguably also included, in different ways, in UNCLOS – albeit tentatively and by way of interpretation, as we have seen – in the FSA[125] and in the Code of Conduct for Responsible Fisheries.[126] In this respect, an important question will be how all these institutions will coordinate their efforts in order to ensure the coordination and compatibility of measures that operationalize the ecosystem approach in the particular geo-ecological areas of relevance, rather than within particular jurisdictional boundaries or areas of competence. Some experience of inter-institutional coordination exists,[127] but the ILBI may offer a new opportunity for rethinking in a more ambitious manner the role of the ecosystem approach for the conservation of marine biological diversity in all maritime zones.[128]

In this respect, while adjacency is high on the agenda of coastal States, compatibility should also be explicitly articulated with respect to the ecosystem approach in order to ensure that measures taken in areas within national jurisdiction do not undermine those taken in areas beyond national jurisdiction in those cases where a target ecosystem straddles jurisdictional lines, both horizontally and vertically.[129] The principle of compatibility, enshrined in article 7 of the Fish Stocks Agreement, has been already introduced in the BBNJ process as regards the issue of ABMTs, and the PREPCOM report, under the heading 'Relationship to measures under relevant instruments, frameworks and bodies', mentions that a future treaty text 'would address the re-

123 CCAMLR, art. II(3)(b).

124 A. Oude Elferink, 'Coastal States and MPAs in ABNJ: Ensuring Consistency with the LOSC', 33:3 The International Journal of Marine and Coastal Law, 2018, 437.

125 Metzer 2009, op. cit.

126 FAO 2003, op. cit.

127 E.g. Memorandum of Understanding between the North East Atlantic Fisheries Commission (NEAFC) and the OSPAR Commission, https://www.ospar.org/site/assets/files/1357/mou_neafc_ospar.pdf, accessed 2 December 2018. Another useful reference, or even model, is the Collective Arrangement entered into also by OSPAR and NEAFC, but aiming at engaging all relevant instruments and bodies competent to take measures within the North East Atlantic. For some further reflections on this see De Lucia 2019b.

128 See on this De Lucia, 2019b, op. cit.

129 Such is the case of the Arctic Large Marine Ecosystem identified by PAME, whose area includes the EEZ of four coastal States as well as the high seas, PAME, 'Large Marine Ecosystems (LMEs) of the Arctic Area. Revision of the Arctic LME Map', 15th of May 2013, Second Edition, PAME-led Group of Experts on the Ecosystem Approach to Management, http://www.pame.is/images/03_Projects/EA/LMEs/LME_revised.pdf, accessed 26 November 2018.

lationship between measures under the instrument and those established by adjacent coastal States, including issues of compatibility'.[130] Here in principle we might have a complex interaction between the future BBNJ body, a regional seas or regional fisheries organization, a coastal state and the International Seabed Authority all involved in establishing compatible measures under the guidance of the ecosystem approach obligations adopted in a BBNJ treaty. Indeed, compatibility is crucial to 'not undermine the effectiveness of […] measures' taken in other maritime zones.[131] But is compatibility enough? This may be an opportunity for rethinking the multiple boundaries of governance that an ecosystem approach would force to confront. And this is not a question of re-writing the principles, rules, rights and obligations of UNCLOS, but of rendering effective existing ones, such as article 192, through their implementation in relation to marine biodiversity *across* sectors (including, importantly, fisheries) and jurisdictional lines, precisely in the way that the ecosystem approach ought to be operationalized. The key to this is the institutional architecture that will come out of the negotiations, as that will establish the rules and mechanisms for the coordination and interaction among existing relevant bodies, instruments, frameworks and mechanisms, whether regional, sectoral or global. If the goal is the maintenance of the ecological integrity of marine ecosystems in ABNJ, then these questions must be raised and addressed head on.

Another important aspect connects with the element of knowledge. For the ecosystem approach to be made operational there is a fundamental requirement of having a sufficiently robust scientific basis for understanding and then protecting and finally monitoring, relevant ecosystems. It is the opinion of the present writer that this aspect has been so far much neglected during the PREPCOM and still during the IGC so far. Ecosystem Monitoring Programs (like e.g. CCAMLR) are however crucial for enabling an ecosystem approach. WWF's submission in this respect also offers useful pointers, but that is hardly enough if the question is not addressed explicitly in the negotiations.

Finally, a robust articulation of the ecosystem approach in the ILBI would also include specific procedural rules to ensure that the iterative requirements of an adaptive management are addressed.

## 5. Conclusions

The ecosystem approach has recently become the preferred framework for addressing holistically the multiscale and complex impacts to biodiversity and ecosystems in a variety of international legal and policy regimes. The ongoing BBNJ process has also identified it as one of the potential guiding principles and/or approaches of a future ILBI. However, it remains unclear what role the ecosystem approach will in fact have and the modality of its inclusion. To date, all evidence points to the fact that the ecosystem approach will be mentioned alongside other potential guiding principles and/or approaches without any further delineation of its substantive and operational aspects.[132] This is likely to leave the question of its legal implications unresolved, especially considering that the ecosystem approach remains ambiguous, is affected by significant conceptual complexities, and has devel-

[130] PREPCOM report, para 4.2.
[131] Art. 7(2)(a9) FSA.

[132] However, draft article 5 of the recently circulated President Draft Treaty text that shall form the basis of IGC-3 negotiations does not include the ecosystem approach, but only a vague "integrated approach", which may or may not be understood as somewhat equivalent to an ecosystem approach, considering the importance of the notion of integration for the latter, as discussed in section, A/CONF.232/2019/6, p. 7.

oped in significantly different ways in different contexts. In this respect, the main risk is that the ecosystem approach will remain a mere mention without any effective mechanisms for its implementation. By converse, the main opportunity is to open substantive discussion on its meaning, key elements and operational ground rules to integrate the work done in different contexts (CBD, UNCLOS, FSA, FAO, OPSAR etc.) and elaborate sufficiently precise provisions in a future ILBI. Considering that it is very likely that any version of the agreement will include hybrid institutional arrangements, with competences distributed between existing regional and future global bodies and institutions, this will also be crucial for ensuring coordination and compatibility between measures, especially with the view of making it possible to delineate the necessary criteria for regional measures to contribute to compliance under the ILBI. WWF's suggestion of including a detailed formulation in an Annex to the agreement has two crucial advantages: it would allow to keep the negotiations on the main treaty text and on the Annex separate, and possibly also on different temporal trajectories; and would allow a leaner modification procedure, on the model of article 48(2) of the FSA. In this respect, the FSA Annex on precaution may be a helpful model. Regardless of the modality of the inclusion of the ecosystem approach in a future ILBI however, the BBNJ negotiation represents an opportunity that should be seized.

# Resilience and Adaptivity of EU Pesticides Law – Assessing Theory and Legal Capacity

*Henrik Jansson**

## Abstract

The utilisation of pesticides in agriculture may contribute to a transgression of the ecological boundaries of the Earth. However, pesticides play an essential role in sustaining human welfare by providing food security. This article explores how the regulatory challenge this poses may be handled and potential ways of improving EU pesticides law from the perspective of 'planetary boundaries'. More specifically, it investigates in which ways social-ecological resilience theory can inform EU pesticides law, whether adaptive and resilience capacity are currently reflected within these legal instruments, and how these capacities can be improved. Regulation 1107/2009 and Directive 2009/128/EC are evaluated against a set of adaptive law criteria measuring the adaptive and resilience capacity of regulatory instruments.

It is concluded that adaptive capacity, contributing to social-ecological resilience, is currently largely well reflected within these instruments. Hence, EU pesticides law may serve as a reference for the making of laws having adaptive and resilience capacity. Certain features of these instruments, however, could be improved. In that regard, social-ecological resilience theory can provide guidance on how to make EU pesticides law capable of handling regulatory challenges, significant for pesticide usage. This theory may be a tool both for establishing legal structures that enhance an informed balancing of different regulatory aims and for including functions within EU pesticides law that are necessary for building resilience within social-ecological systems. This includes the ability to avoid the transgression of ecological thresholds. However, additional theoretical concepts and tools are likely to be required to ensure that pesticide usage does not actually contribute to transgression of 'planetary boundaries'.

**Keywords**: pesticides, agriculture, resilience, EU law, adaptive law

## 1. Introduction

Pesticide use is standard practice in today's farming.[1] The main function of pesticides in agricultural production is to guarantee food security. The concept of food security is defined as the condition where 'all people in a country, at all times, have physical and financial access to adequate, safe, and nutritious food that meet their dietary needs and food preferences'.[2] The potential benefits of pesticides are, *inter alia*, decreased food losses, elimination of pathogens, and reduced labour and energy use.[3] If the utilisation of chemical pesticides ceased it is estimated that

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[1] European Environment Agency, 'Pesticide Sales' (29 November 2018) <www.eea.europa.eu/airs/2018/environment-and-health/pesticides-sales> accessed 13 October 2019.

[2] David A Bender, 'Food Security', *A Dictionary of Food and Nutrition* (4 edn, Oxford University Press 2014).

[3] Emanuela Bozzini, *Pesticide Policy and Politics in the European Union: Regulatory Assessment, Implementation and*

between 25% and 40% of the world food supply could be lost each year, seriously jeopardising food security.[4] Moreover, pesticides may reduce the cost of food production, making food more affordable for people that currently suffer from starvation.[5]

Looking ahead, it is believed that agricultural production will have to increase by 75% in the years to come in order to sustain the growing human population of the world.[6] In light of this, it is argued that pesticides based on all available technologies must be utilised in order to achieve food security.[7] This view is questioned by a variety of actors: from activists to institutions. Their counterarguments contend that intensive farming methods, with extensive use of pesticides, are unsustainable. In the long term there is a risk that these methods may ruin the natural factors that are necessary for agricultural production such as fertile soil, clean water and biodiversity. Furthermore, pests tend to develop resistance to the pesticides they are exposed to; in other words, the efficiency of pesticides falls the more they are used, causing a need for increased pesticide usage.[8] It is argued that food security instead should be achieved by methods based on small-scale production, variegated production, and organic methods that do not jeopardise natural resources.[9]

Looking into the development of toxicology (the scientific study of poisons and their effects on living organisms) there is no 'linear progression of discoveries leading to an orderly accumulation of evidence'.[10] The history of the field is instead characterised by contradictions and contrasts between competing paradigms, which have been described as 'a back and forth of forgetting, remembering, contest and disagreement'.[11] Nevertheless, nowadays there is a general awareness of the potential harms of pesticides among scientists, regulators and citizens. With regards to human health concerns, even though the exposure is low pesticides are thought to cause illness to individuals exposed to them over a long period of time such as workers, bystanders, and those living in agricultural areas. Cancer, neurological diseases, chronic asthma as well as effects on fertility and reproduction are some of the many health issues that may occur.[12] From an environmental perspective pesticides pose a range of risks to individual species and whole ecological systems. The poisoning of non-target animals such as birds, butterflies and frogs, and beneficial insects – such as bees and other pollinators – has been noticed. Such effects threaten biodiversity which, in turn, ultimately puts food production at risk. Moreover, many pesticides have a persistent characteristic, i.e. they do not easily disappear and may cause problems even a

*Enforcement* (Cham: Springer International Publishing 2017) 8, 21.

4 Ibid. 9, with reference to Graham Matthews, *Pesticides: Health, Safety and the Environment* (John Wiley & Sons 2016).

5 Ibid. 9.

6 Ibid. 9, with references to FAO, 'How to Feed the World in 2050' <www.fao.org/fileadmin/templates/wsfs/docs/expert_paper/How_to_Feed_the_World_in_2050.pdf> accessed 13 October 2019.

7 Peter Chapman, 'Is the Regulatory Regime for the Registration of Plant Protection Products in the EU Potentially Compromising Food Security?' (2014) 3(1) Food and Energy Security 1.

8 HF van Emden and MW Service, *Pest and Vector Control* (Cambridge University Press 2004) 115–116.

9 Bozzini (n 3) 10; United Nations General Assembly (UNGA), 'Report submitted by the Special Rapporteur on the right to food, Olivier De Schutter' (20 December 2010) Human Rights Council, Sixteenth session UN Doc A/HRC/16/49.

10 Bozzini (n 3) 13.

11 David Hecht and others, 'Comments on Davis, "Banned: A History of Pesticides and the Science of Toxicology"' (2015) 5(8) H-Environment Roundtable Reviews 1, 14.

12 Bozzini (n 3) 12.

long time after initial application as they spread through ecosystems. This may lead to, *inter alia*, pollution of soil and groundwater.[13] Over time, more and more 'unexpected' effects of chemicals have been discovered, followed by controversies surrounding the issue of causality in complex ecosystems.[14] One example of this is neonicotinoids, a class of pesticides that were introduced in the 1980s. They are now deemed a possible cause for the decline of honeybee and bumble bee populations observed in Europe and the U.S. since the early 2000s.[15]

The tension between achieving food security and protecting the environment and human health is at the centre of pesticide policy and politics. This conflict is reflected in every regulatory regime on the matter.[16] Within the European Union (EU), regulatory action on agricultural pesticide usage was taken in the early 1990s. This may be understood by the need to harmonise environmental protection measures in order to not disturb the functioning of the EU internal market. Environmental issues were also gaining increased attention among EU citizens and governments.[17] Current EU legislation on the matter was adopted in 2009 and establishes rules on both the pre- and post-market phases of pesticide usage.[18] From a global perspective EU pesticide regulation may be considered comparatively strict. During the last few decades, hundreds of chemicals that are in normal use in other parts of the world have been removed from the EU market.[19]

## 2. Exploring Potential Ways to Improve EU Pesticides Law

### 2.1 Framing The 'External' Issue

This article takes its point of departure from an issue 'external' to the law, namely the utilisation of pesticides in agricultural production. To put this into context, one may turn to the concept of 'planetary boundaries'. This concept is a tool to understand and address the pressures that human activity is posing to the Earth. In this area of research nine 'planetary boundaries' within which it is expected that humanity can 'operate safely' are identified. Transgressing one or more of these boundaries may be 'deleterious or even catastrophic for human well-being'.[20] It is suggested that non-linear and abrupt change on a planetary level could be triggered.[21]

The large number of chemicals that are used commercially in agricultural production cause countless adverse effects to species and ecosystems. It was recently concluded that 40% of the world's insect species are threatened with extinction and pesticide usage was identified as one of the reasons for this.[22] It has been concluded that chemical pollution stresses ecosystems and human health to the extent that the 'safe operat-

[13] Ibid, with references to André Leu, *The Myths of Safe Pesticides* (Acres 2014) and Jules Pretty (ed), *The Pesticide Detox: Towards a More Sustainable Agriculture* (Earthscan 2005).

[14] Bozzini (n 3) 11–13; Martin Enserink and others, 'The Pesticide Paradox' (2013) 341(6147) Science 728, 728.

[15] Bozzini (n 3) 77–78.

[16] Ibid. 2.

[17] Albert Weale and others, *Environmental governance in Europe: An ever closer ecological union?* (Oxford University Press 2000) 491.

[18] Regulation (EC) 1107/2009 of the European Parliament and of the Council of 21 October 2009 concerning the placing of plant protection products on the market and repealing Council Directives 79/117/EEC and 91/414/EEC [2009] OJ L309/1 (hereinafter PPP Reg); Directive 2009/128/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for Community action to achieve the sustainable use of pesticides [2009] OJ L309/71 (hereinafter SUD).

[19] Bozzini (n 3) 19, 21.

[20] Johan Rockström and others, 'Planetary Boundaries: Exploring the Safe Operating Space for Humanity' (2009) 14(2): 32 Ecology and Society.

[21] Ibid.

[22] Francisco Sánchez-Bayo and Kris A G Wyckhuys, 'Worldwide Decline of the Entomofauna: A review of its drivers' (2019) 232 Biological Conservation 8, 8.

ing space' of the 'planetary boundary' of chemical pollution is being transgressed.[23] It must be noted, however, that properly relating pesticide usage to the concept of 'planetary boundaries' is complicated. An activity may pose pressure in relation to several boundaries at the same time. Interactions between pressures, related to different boundaries, may also change the safe level of one or more boundaries.[24] For example, chemical pollution may influence the biodiversity boundary by reducing the abundance of species and potentially increasing the vulnerability of species to other pressures such as climate change.[25]

### 2.2 The Choice of Theory: Social-Ecological Resilience

The aim of this article is to explore potential ways of improving EU pesticides law using the perspective provided by the concept of 'planetary boundaries', which suggests the choice of social-ecological resilience as a theoretical framework. More specifically, the aim is to investigate in what way social-ecological resilience theory can inform EU pesticides law, and whether EU pesticides law currently has the capacity to contribute to the resilience of social-ecological systems. Social-ecological resilience theory intends to understand and address the challenges stemming from the interaction of social and ecological dynamics. This theory provides, *inter alia*, a theoretical framework for research on environmental governance providing an interdisciplinary perspective.[26] As a theoretical framework, social-ecological resilience aims to be a tool for ensuring human well-being in the face of the rapid changes, complexity, and inherent uncertainties which are perceived to characterise the world of today.[27] These characteristics are also significant for issues related to agricultural pesticide usage.[28] However, the law often struggles to deal with them.[29] One of the suggestions within law and resilience research is that, in the light of social-ecological resilience theory, the law should be adaptive. Adaptive law theory comes with propositions on, *inter alia*, how the law ought to be in order to contribute to social-ecological resilience. Within research, fairly distinctive criteria for measuring the adaptive capacity of the law have been suggested.[30] Therefore, adaptive law theory has been chosen here as the specific framework for evaluating EU pesticides law.

### 2.3 Defining the Research Questions

The aim of this article is not to determine what the law ought to be, but to explore ways in which the law may be improved. Hence, the first

[23] ML Diamond and others, 'Exploring the Planetary Boundary for Chemical Pollution' (2015) 78 Environ Int 8, 8.

[24] Rockström and others (n 20).

[25] Ibid, with references to Bjørn Munro Jenssen, 'Endocrine-disrupting chemicals and climate change: a worst-case combination for arctic marine mammals and seabirds?' (2005) 114(Suppl 1) Environmental Health Perspectives 76; Pamela D Noyes and others, 'The toxicology of climate change: environmental contaminants in a warming world' (2009) 35(6) Environ Int 971.

[26] Social-ecological resilience theory is presented and addressed in detail below in section 3.

[27] Reinette Biggs, Maja Schlüter and Michael L. Schoon, 'An Introduction to the Resilience Approach and Principles to Sustain Ecosystem Services in Social-Ecological Systems' in Reinette Biggs, Maja Schlüter and Michael L. Schoon (eds), *Principles for Building Resilience: Sustaining Ecosystem Services in Social-Ecological Systems* (Cambridge University Press 2015) 1, 5, with references to Brian Walker and David Salt, *Resilience Thinking: Sustaining Ecosystems and People in a Changing World* (Island Press 2006); Carl Folke and others, 'Resilience Thinking: Integrating Resilience, Adaptability and Transformability' (2010) 15(4): 20 Ecology and Society.

[28] See above section 1.

[29] Brita Bohman, *Transboundary Law for Social-Ecological Resilience? A Study on Eutrophication in the Baltic Sea Area* (Department of Law, Stockholm University 2017) 26; Staffan Westerlund, *Fundamentals of Environmental Law Methodology* (Uppsala University, Department of Law 2007) 156 ff.

[30] See below section 4.3.

research question will investigate the potential function of social-ecological resilience as a theoretical framework guiding this regulatory field. The first research question is:

> In what aspects can social-ecological resilience theory inform the making of EU pesticides law?

Furthermore, the aim is to examine current EU pesticides law and the extent of its capacity to contribute to the resilience of social-ecological systems from the specific perspective of adaptive law theory. This includes investigating if this capacity could be improved, and if so, in what aspects. Thus, the second and third research questions are:

> Is adaptive capacity, contributing to social-ecological resilience, reflected in EU pesticides law? If so, how is this reflected?
>
> Can adaptive capacity of EU pesticides law, contributing to social-ecological resilience, be increased? If so, in what aspects?

Since the focus is on the phenomenon of pesticide usage in agricultural production, the substantial scope of this article will be the regulation of pesticides used for plant protection. Consequently, the main research objects will be Regulation 1107/2009 on the 'Placing on the Market of Plant Protection Products' (PPPs) (hereinafter the PPP Regulation) and Directive 2009/128/EC on the 'Sustainable Use of Pesticides' (hereinafter the SUD).[31] Regulation 396/2005 on 'maximum residue levels of pesticides in or on food and feed of plant and animal origin' and Regulation 1185/2009 'concerning the statistics on pesticides' are relevant with regard to issues related to pesticides but not directly related to the activity of pesticide application in agriculture. They are therefore excluded from the scope of this article.[32] If relevant for evaluating the functioning of the PPP Regulation and the SUD, the research object will be extended beyond these instruments and also include the EU Treaties and other EU secondary law.

### 2.4 'Internal' and 'External' Law Methodology

The first research question is answered by a review of the literature addressing social-ecological resilience theory from both a general viewpoint and in the specific context of the law. With regards to the second and third research questions, a methodology based on both an 'external' and an 'internal' perspective on the law is employed. The 'external' perspective is built on principles, derived from social-ecological resilience theory, which specify features and functions for building resilience. More specifically, it employs certain criteria for evaluating resilience and adaptive capacity of environmental regulatory instruments, identified on the basis of adaptive law and resilience literature.[33] To properly evaluate EU pesticides law against these criteria a method with an 'internal' perspective is required, in order to say what the law is. Within the EU legal order, there are certain legal sources and certain methods used for legal interpretation. Three 'classical' methods of interpretation are prominent

[31] PPP Reg; SUD.

[32] Regulation (EC) No 396/2005 of the European Parliament and of the Council of 23 February 2005 on maximum residue levels of pesticides in or on food and feed of plant and animal origin and amending Council Directive 91/414/EEC [2005] OJ L70/1; Regulation (EC) No 1185/2009 of the European Parliament and of the Council of 25 November 2009 concerning statistics on pesticides [2009] OJ L324/1.

[33] Niko Soininen and Froukje Maria Platjouw, 'Resilience and Adaptive Capacity of Aquatic Environmental Law in the EU: An Evaluation and Comparison of the WFD, MSFD, and MSPD' in David Langlet and Rosemary Rayfuse (eds), *The Ecosystem Approach in Ocean Planning and Governance* (Brill 2018) 30.

within the EU legal order – literal, systematic, and teleological methods.[34] The interpretation of the law at hand will take its point of departure from a literal interpretation, namely by looking at the written text of legal provisions and finding meaning through the usual (contemporary) meaning of the words.[35] Besides literal interpretation, systematic and teleological interpretations will also be employed, especially if the wording is not clear and precise.[36] Through a systematic interpretation, the meaning of a legal provision is constructed by considering the functional relationship between the provision at issue and the normative system to which it belongs, i.e. its place within the wider EU legal order. By this method, a provision cannot be interpreted in a way the creates conflict between the specific provision and the context of which it is part.[37] This largely contextual perspective often goes hand in hand with teleological interpretation, which creates the meaning of a provision by searching for the purpose, spirit, or useful effect of it.[38] For an appropriate interpretation of EU law, these three methods should not be considered or applied in isolation, but instead should 'operate in a mutually reinforcing manner'.[39]

## 3. Setting the Theoretical Frame

### 3.1 Viewing the World as Social-Ecological Systems

Social-ecological resilience theory comes with a fundamental assumption of the relationship between humans and nature. Within this theory, human society is viewed as part of the biosphere.[40] This means that humanity and nature are intertwined and interdependent. Human action shapes ecological dynamics from local to global scales, while at the same time humans rely on nature for well-being.[41] An example of this is that farming affects and shapes ecosystems, habitats and landscapes both locally and globally. At the same time, the ability to produce food is dependent on ecosystem services[42] such as pollination and the storage and cycling of water, nutrients and carbon.[43] The notion of human society as an inherent part of the biosphere means the world can be understood as a social-ecological system.[44] Systems can be natural, such as ecosystems, or man-made, such as monetary systems.[45] The joining of natural systems, e.g. an area of land, with social systems, e.g. agriculture, may be defined as a social-ecological system. To clarify, the interactions between humanity and nature

[34] Lenaerts Koen and A. Gutiérrez-Fons José, 'To Say What the Law of the EU Is: Methods of Interpretation and the European Court of Justice' (2014) 20 Columbia Journal of European Law 3, 3.
[35] Ibid. 8.
[36] Ibid. 59.
[37] Ibid. 16–17.
[38] Robert Schütze, *European Union Law* (Cambridge University Press 2015) 207.
[39] Koen and José (n 34) 61.

[40] The biosphere is a term that refers to the surface part of the Earth in which living organisms exist and interact – the sum of all ecosystems. Chris Park and Michael Allaby, 'Biosphere (Ecosphere)', *A Dictionary of Environment and Conservation* (3 edn, 2017).
[41] Biggs, Schlüter and Schoon (n 27) 8, with references to Carl Folke, 'Resilience: The Emergence of a Perspective for Social–Ecological Systems Analyses' (2006) 16 Global Environmental Change 253; Carl Folke and others, 'Reconnecting to the Biosphere' (2011) 40(7) AMBIO 719.
[42] Generally, the concept of ecosystem services can be defined as 'the direct and indirect contributions of ecosystems, in interaction with contributions from human society, to human well-being'. Leon C Braat, 'Ecosystem Services', *Oxford Research Encyclopedia of Environmental Science* (Oxford University Press 2016).
[43] Mary Jane Angelo and Joanna Reilly-Brown, 'Whole-System Agricultural Certification: Using Lessons Learned from Leed to Build A Resilient Agricultural System to Adapt to Climate Change' (2014) 85 U Colo L Rev 689, 719–721.
[44] Biggs, Schlüter and Schoon (n 27) 1.
[45] Shelley Ross Saxer and Jonathan D. Rosenbloom, *Social-Ecological Resilience and Sustainability* (Wolters Kluwer 2018) 3.

are not seen as simply social plus ecological systems, but as cohesive social-ecological systems.[46]

Research suggests that social-ecological systems are characterised by strong interactions and feedback between social and ecological dynamics, which determine the overall dynamics of the systems.[47] In social-ecological systems, change is perceived to take place along and across various scales, such as spatial and temporal scales, as well as within and across different domains. For example, global warming, which is a global phenomenon caused by local activities, may change the occurrence and distribution of pests, which in turn may lead to increased use of pesticides at a local level.[48] Another example is that consumer preferences, social norms, or policies at different levels – for example with regard to organic farming – may have an impact on pesticide usage in agricultural production. This in turn could have an effect on biodiversity and ecosystem services.[49] Change may be slow, such as degradation of ecosystem services due to agricultural intensification, or change may be fast, such as introduction of new regulation in the wake of a crisis (a historical example is the response to mad cow disease).[50] Thus, processes at different scales interact and generate feedback that leads to unexpected outcomes, making it difficult to predict behaviour and effects. This leads to another fundamental assumption of social-ecological resilience theory with regard to the character of social-ecological systems, namely that they behave as complex adaptive systems. In short, this means that:

1) they have the capacity to self-organise and adapt, based on past experience,
2) they are characterised by emergent and non-linear behaviour, and
3) they have an inherent uncertainty.[51]

This assumption, that the world is characterised by rapid social, technological, and ecological changes that are not linear or foreseeable but include irregular responses, surprises, and cascading effects,[52] has implications for the understanding and governing of social-ecological systems. Inevitably, it calls for governance that is able to deal with profound uncertainty.[53]

### 3.2 The Concept of Resilience

In relation to social-ecological systems, the concept of resilience may have two functions that should be distinguished.[54] The first of these is that it may be a property of a system, i.e. may serve to describe a system characteristic. This characteristic has been defined in variety of ways. The most popular definition reads 'the capacity of a system to absorb disturbance and still retain its basic structure and function'.[55] The term resilience has its roots in the discipline of ecology, introduced by C.S. Holing in the early 1970s. Holing used the term resilience to refer to the capacity of an ecosystem to stay within a stable state, i.e. the

[46] Biggs, Schlüter and Schoon (n 27) 8, with reference to Folke and others (n 27).

[47] Biggs, Schlüter and Schoon (n 27) 8, with references to Folke and others (n 27); Carl Folke and others, 'Adaptive Governance of Social-Ecological Systems' (2005) 30 Annu Rev Env Resour 441, 443.

[48] Rockström and others (n 20).

[49] Biggs, Schlüter and Schoon (n 27) 11–12, with references to Eric F Lambin, Helmut J Geist and Erika Lepers, 'Dynamics of Land-Use and Land-Cover Change in Tropical Regions' (2003) 28 (1) Annu Rev Env Resour 205, and Fikret Berkes and others, 'Globalization, Roving Bandits, and Marine Resources' (2006) 311(5767) Science 1557.

[50] Ika Darnhofer, John Fairweather and Henrik Moller, 'Assessing a Farm's Sustainability: Insights from Resilience Thinking' (2010) 8(3) International Journal of Agricultural Sustainability 186, 187.

[51] Biggs, Schlüter and Schoon (n 27) 1.

[52] Bohman (n 29) 26.

[53] Biggs, Schlüter and Schoon (n 27) 12.

[54] Ibid. 13.

[55] Tracy-Lynn Humby, 'Law and Resilience: Mapping the Literature' (2014) 4 Seattle J Envtl L 85, 90, with reference to Walker and Salt (n 27) iii.

amount of disturbance an ecosystem can endure before its controls shift to another stable state.[56] Thus, a system's resilience may be measured in terms of distance from thresholds. If these thresholds are passed, the system will be pushed into a new regime.[57]

The second function uses the concept of resilience as an approach, with a set of certain assumptions, for addressing the tension between persistence and change in social-ecological systems. This means that it serves as a tool for analysing, understanding, and managing the capacity of these systems to handle pressures and absorb shocks, and subsequently maintain their core functions. As part of this, it is also a tool to maintain capacity of renewal, reorganisation and development of social-ecological systems.[58] It is thus an analytical framework to address and handle the continuous changes and uncertainties that characterise social-ecological systems. It may provide practical guidance for decision-makers, as well as practitioners, on the challenges inherent in these systems.[59]

Regarding the function of resilience as an analytical framework, one should note that, in addition to the ability to endure pressures, the resilience perspective has been refined to include the ability of a system to adapt and transform. These three aspects interrelate across multiple scales. Adaptability is part of the resilience perspective, representing the capacity to respond to changing external drivers as well as internal processes and allowing for development and change along the current stable state.[60] In an agricultural context, this could mean replacing pest management strategies that are based on intensive chemical input with crop rotation in order to preserve biodiversity and ecosystem services. Transformability is also part of the resilience concept. This refers to the capacity to cross thresholds and enter into a new stable state.[61] In an agricultural context, this could mean a farmer diversifying into new activities that were previously not considered to be in their remit, such as tourism or energy production.[62] Intuitively, transformability may seem contrary to the basic understanding of resilience. However, from a resilience perspective, changes, crises, shocks, and disturbances are not necessarily viewed as something negative that should be avoided at every price. Instead, it is accepted as an inherent feature of social-ecological systems, which constitute opportunities for change, renewal and reorganisation.[63] For example, transformation at smaller scales is perceived to enable resilience at larger scales by using crises at smaller scales as an opportunity for novelty and innovation, combining experience and knowledge to navigate transitions.[64] Consequently, analysing social-ecological systems can be carried out along these three inter-dependent dimensions.[65] Together with the identity or the state of the system at issue, i.e. the variables that constitute the system, these dimensions are all considered essential for understanding the resilience perspective.[66]

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[56] Folke (n 41) 254.
[57] Walker and Salt (n 27) 63.
[58] Biggs, Schlüter and Schoon (n 27) 10, with reference to Folke (n 41).
[59] Biggs, Schlüter and Schoon (n 27) 1.
[60] Ibid. 9, with references to Folke (n 41), and Simon Levin and others, 'Social-ecological systems as complex adaptive systems: modeling and policy implications' (2013) 18(2) Environment and Development 111.
[61] Ibid.
[62] Ika Darnhofer, John Fairweather and Henrik Moller, 'Assessing a Farm's Sustainability: Insights from Resilience Thinking' (2010) 8(3) International Journal of Agricultural Sustainability 186, 192.
[63] Biggs, Schlüter and Schoon (n 27) 9, with references to Folke (n 41), and Levin and others (n 60).
[64] Folke and others (n 27).
[65] Humby (n 55) 94, with reference to Steve Carpenter and others, 'From Metaphor to Measurement: Resilience of What to What?' (2001) 4(8) Ecosystems 765.
[66] Humby (n 55) 104–105, with reference to Richard A Barnes, 'The Capacity of Property Rights to Accommo-

### 3.3 Social-Ecological Resilience Related to Sustainability

In order to clarify the concept of resilience, it may be of value to relate and contrast it with the sustainability concept. Sustainability may be understood as a perspective for integrating – or balancing – environmental protection, economic development, and social justice.[67] The resilience perspective is considered part of the broader field of sustainability science, since sustainability may include knowing if, and where, thresholds exists within a system, and also include the capacity to manage the system so as to stay within these thresholds.[68] Within research, it is suggested that a social-ecological system that is not resilient is 'unlikely to be sustainable' since a system that is close to one or more thresholds is more likely to experience regime shift and change of its core features. In other words, such a system is unsustainable. In fact, it is argued that sustainability is not an appropriate framework for analysing the challenges of social-ecological systems as it lacks capability to provide tools for coping with change, which is seen as an inherent feature of social-ecological systems.[69]

At the same time, 'a system that is unsustainable may still be resilient, although it is likely to be strained'.[70] For example, a system may utilise natural resources in a way that deprives future generations of essential ecosystem services, but the system itself may still be extremely resilient and resistant to change. There are many examples of economic systems being resilient, while at the same time putting unsustainable pressure on ecological systems. However, the longer unsustainable behaviour continues in a system, the more likely it is that its resilience capacity will decrease.[71]

From a sustainability perspective, many have argued that it should be the ecological factors that set the conditions for any other development, such as social and economic development.[72] The resilience perspective also recognises that the ecological factors set the base and thresholds of the social-ecological systems, but it also suggests that the relationship between the different elements of social-ecological systems are more complex.[73] By using the concept 'social-ecological', the interplay between social and ecological systems could be illustrated, without treating either the social or the ecological aspect as a prefix, implying that it should be given more weight in an analysis.[74] Within resilience research, it is suggested that analysing only the social or the ecological systems will lead to too narrow conclusions, and that these conclusions will subsequently be insufficient for guiding society towards sustainability.[75] Indeed, not neglecting social perspectives may be essential for achieving sustainable agricultural production. In an agricultural context with private ownership, it is the farmer's right to manage their property in accordance with their preferences. Hence, it is to a large extent social subjects that ultimately decide (taking into account regulations and

date Social-Ecological Resilience' (2013) 18(1): 6 Ecology and Society.

67 Saxer and Rosenbloom (n 45) 27, with reference to John C Dernbach, 'Sustainable Development and the United States' in John C Dernbach (ed), *Agenda for a Sustainable America* (Environmental Law Institute 2009) 9.

68 Walker and Salt (n 27) 63.

69 Saxer and Rosenbloom (n 45) 58.

70 Ibid. 56.

71 Ibid. 57.

72 See e.g. Klaus Bosselmann, *The Principle of Sustainability: Transforming Law and Governance* (Ashgate, ebook 2008); Klaus Bosselmann, Ron Engel and Prue Taylor, *Governance for Sustainability – Issues, Challenges, Successes* (IUCN Environmental Policy and Law Paper No 70, IUCN Commission on Environmental Law (CEL) and IUCN Environmental Law Centre (ELC) 2008).

73 Bohman (n 29) 37.

74 Carl Folke and others, 'Adaptive Governance of Social-Ecological Systems' (2005) 30 Annu Rev Env Resour 441, 443.

75 Ibid.

market conditions) how much and which pesticides are to be used on farmland. Decisions will be influenced by social factors such as: economic frameworks, social norms, local conditions etc.; and how these factors are perceived by the individual farmer.[76] Another important social aspect is that of agriculture providing viable livelihoods for local people.[77] Without this, farmers may be forced to seek livelihood in other activities, perhaps leaving rural areas. Then, the social-ecological system of agriculture will not be able to continue to exist, much less develop. In such a scenario, one can expect the wider social-ecological system of rural areas to also be affected.

Further addressing the normative dimensions of the perspectives of resilience and sustainability, it is argued that sustainability includes value judgements by finding something to be good and desirable, and therefore deciding that it should be sustained.[78] Accordingly, sustainability has a normative dimension. In comparison, it is argued that resilience as an analytical tool assesses the state of a system and its ability to retain core characteristics, not whether these core characteristics are desired or undesired.[79] One should, however, remember that decisions about governance of social-ecological systems inevitably require trade-offs that are inherently political. Different sectors and groups prefer, need and demand different values and functions. These trade-offs will be influenced by issues of power and inequality.[80] Despite acknowledging the importance of not neglecting the social aspect in analysing social-ecological systems, the resilience perspective largely lacks attention to phenomena such as agency, conflict and power.[81] Applying social-ecological resilience theory uncritically may thus implicitly recognise the interests and preferences of some groups, while ignoring the interests and preferences of others.[82]

### 3.4 Social-Ecological Resilience and the Law

The concepts, rules, procedures and institutions of legal systems affect the resilience capacity of social-ecological systems. Depending on what the law looks like it may contribute to the capacity of a system to: deal with uncertainties and surprises, absorb stress and external disturbances, manage non-linear effects, cross thresholds, and adapt to new circumstances.[83] There is a consensus that the resilience perspective could serve as a conceptual framework for making the law capable of responding to the complexity and unpredictability of social-ecological systems.[84]

There are often normative ends in legal systems related to concepts such as justice and the rule of law.[85] The rule of law implies constraints on the power of government and is often understood as ensuring legal certainty and predictability. Through this, it should be possible for individuals in the legal system to know what is permitted, ordered, prohibited, etc., and from that choose and adjust their behaviour. It is argued that legal certainty is essential for establishing trust in government and making it possible for individuals to plan their behaviour without unexpected public interference, or interference

[76] Darnhofer, Fairweather and Moller (n 62) 192–193.
[77] Angelo and Reilly-Brown (n 43) 724.
[78] Saxer and Rosenbloom (n 45) 58.
[79] Ibid.
[80] Michael L Schoon and others, 'Politics and the Resilience of Ecosystem Services' in Reinette Biggs, Maja Schlüter and Michael L Schoon (eds), *Principles for Building Resilience: Sustaining Ecosystem Services in Social-Ecological Systems* (Cambridge University Press 2015) 32–34.
[81] Lennart Olsson and others, 'Why Resilience is Unappealing to Social Science: Theoretical and Empirical Investigations of the Scientific Use of Resilience' (2015) 14 Science Advances 1, 9.
[82] Schoon and others (n 80) 32–34.
[83] Jonas Ebbesson and Ellen Hey, 'Introduction: Where in Law is Social-Ecological Resilience?' (2013) 18(3): 25 Ecology and Society.
[84] Humby (n 55) 105.
[85] Ebbesson and Hey (n 83).

from other individuals.[86] Moreover, in many legal systems, the law often seeks to protect values such as equality before the law and non-discrimination. The law is also used as an instrument to achieve various environmental and social objectives such as: protecting biodiversity; enhancing the competitiveness of an industry sector; or establishing a functioning market.[87] In the light of these aspects, the law may be considered important for providing both social stability and stability in human interactions. When viewing democracy, economic stability, and general development as parts of the resilience of a social system, the features of the rule of law and legal certainty are essential from a social-ecological resilience perspective.[88]

However, these traditional legal features may at the same time decrease the overall resilience capacity of social-ecological systems. Features that have been identified as fostering resilience are, inter alia, flexibility in social systems and institutions (in order to deal with change); openness of institutions (so as to provide for extensive participation and effective multi-level governance); and social structures that promote learning and adaptability (without limiting options for future development).[89] Thus, linking resilience theory with legal research means joining two domains that come with a variety of different normative values. It is however concluded that the law itself does not necessarily hinder ambitions to create resilient social-ecological systems. Instead it depends on the content of the rules and the institutions that are set up. Moreover, the static character of the law should be nuanced. In law, there is always room for a certain amount of interpretation, sometimes wider and sometimes narrower. Applying the law includes utilising different arguments, from different sources, and weighing those against each other to determine which particular interpretation should triumph.[90]

Despite being embraced by legal scholars as an analytical framework, it is nevertheless questioned if the resilience perspective can be applied in an equal manner to both ecological systems and social systems (such as the law). It is argued that the resilience perspective fails to acknowledge essential differences between social and ecological systems. Many of the concepts relating to resilience were established in the field of ecology and the resilience of social systems may rely upon fundamentally different factors to that of the resilience of ecological systems.[91] Since social systems are socially constructed, the result of human ideas and thoughts, it is argued that the understanding of them must be fundamentally different.[92] This implies possible risks when applying social-ecological resilience theory in legal research and calls for cautiousness and close scrutiny of the accuracy of the results of such research.

## 4. Evaluating EU Pesticides Law

### 4.1 Adaptive Law for Social-Ecological Resilience?

This evaluation of EU pesticides law will be limited to the perspective provided by adaptive law theory, which includes a wide range of aspects considered to be important for building social-ecological resilience. However, from a resilience perspective an evaluation employ-

[86] Jonas Ebbesson, 'The Rule of Law in Governance of Complex Socio-Ecological Changes' (2010) 20 Global Environmental Change 414, 415, with references to Joseph Raz, 'The rule of law and its virtue' (1977) 93(2) The Law Quarterly Review 195, 195–211 and, Ronald Dworkin, *Law's Empire* (Harvard University Press 1986).

[87] Ebbesson and Hey (n 83).

[88] Bohman (n 29) 379.

[89] Ebbesson and Hey (n 83).

[90] Ebbesson (n 86) 421.

[91] Bohman (n 29) 43.

[92] Saxer and Rosenbloom (n 45) 25, with reference to Olsson and others (n 81).

ing the theoretical perspective of adaptive law should not be considered exhaustive. For example, fostering complex adaptive systems thinking – which is considered a key principle for resilience building[93] – seems often to be neglected in adaptive law theories. Another example is that the notion of transformability, i.e. the capacity to cross thresholds and enter into new stable states, is poorly reflected.[94] In adaptive law theory it seems that the focus instead is on development along the current stable state. Consequently, in an analysis based on adaptive law theory there is a risk that the transformability aspect of resilience is overlooked. Finally, one should note that resilience may be reflected in governance measures and other structures beyond the law.[95] Law is only one of many factors that affect the capacity of social-ecological systems to handle uncertainty and change.[96]

Nevertheless, the insights provided by research on the dynamics of social-ecological systems have led to an interest in the concept of adaptive law. The slow down effect that law often has in relation to change may be helpful in absorbing shocks and disturbances up to a certain point. However, the insights on the scale and pace of change in social-ecological systems that is characterised as abrupt, unexpected, and non-linear, require the law to be flexible and adaptive. If not, the law can contribute to ecological and subsequently social collapse.[97] This call for adaptivity may, however, present a challenge to the law. In the light of adaptive law theory, certain common deficiencies of the law have been identified. They have been categorised into

1) the perspectives on nature,
2) substantive goals,
3) the structure of governing authority, and
4) structuring of legal practice and decision-making.[98]

In short, the incorrect perspective of nature refers to an incorrect view of ecological systems and their links to social systems.[99] For example, the foundations of U.S. environmental law reflect the assumption that nature is relatively stable, predictable, and mostly changes in a linear way.[100] With regards to substantive goals, they are considered to be too focused on ensuring stability, certainty, and security of supply. The law generally mandates optimal use of natural resources, not only with regards to one interest, but with regards to several interests. This weakens the resilience of the ecological systems and subsequently the resilience of social-ecological systems.[101] Structure of governing authority refers to the extent that the law centralises power, the modes in which the law allows an authority to exercise power, and how governing authorities operate across different scales. More specific issues identified are the preference for a strong centralised government which is often poorly matched to the scale, scope, and speed at which

[93] Erin L Bohensky and others, 'Principle 4 – Foster Complex Adaptive Systems Thinking' in Maja Schlüter, Michael L Schoon and Reinette Biggs (eds), *Principles for Building Resilience: Sustaining Ecosystem Services in Social-Ecological Systems* (Cambridge University Press 2015) 142 ff.

[94] See above section 3.2.

[95] Bohman (n 29) 394.

[96] Ebbesson and Hey (n 83).

[97] Craig Anthony Arnold and Lance H Gunderson, 'Adaptive Law and Resilience' (2013) 43(5) Environmental Law Reporter 10426, 10427, with reference to Lance Gunderson and others, 'Water RATs (resilience, adaptability, and transformability) in lake and wetland social-ecological systems' (2006) 11(1): 16 Ecology and Society.

[98] Humby (n 55) 107.

[99] Ibid. 107–108.

[100] Arnold and Gunderson (n 97) 10426, with references to JB Ruhl, 'Climate change and the Endangered Species Act: building bridges to the no-analog future' (2008) 88 BUL Rev 1; Robin Kundis Craig, 'Stationarity is dead – long live transformation: five principles for climate change adaptation law' (2010) 34 Harv Envtl L Rev 9.

[101] Humby (n 55) 108–109.

stress occurs in social-ecological systems. Another issue is the approach of choosing one particular mode, instrument, or method as the 'optimal': a one-size-fits-all approach. It is suggested that this increases vulnerability and weakens the capacity to address the complexity and unpredictability of social-ecological systems.[102] Finally, the nature of legal processes and legal values may hinder adaptivity. It is claimed that this results in a tendency to establish pre-determined, linear pathways for planning and development within the law. This may seem rational but assumes stationarity and predictability of ecological and social systems.[103] Moreover, environmental law and natural resource law also often lack efficient feedback-loops or if they do exist, they are not utilised.[104]

Turning a critical lens on adaptive law theory, one may note that adaptive law, as a theoretical concept, is neutral. Thus, a strong call for adaptive law raises the question of adaptivity for whom? In regards to which interests and preferences will the law provide adaptivity? Adaptivity may further the cause of the environmentalist or it may further the interests of the industrialist who wants to derogate from environmental protection measures.[105] Another example is that the relationship between, on the one hand, the resilience perspective including adaptive law, and, on the other hand, environmental human rights and environmental justice, has not been explored. It is not clear how adaptive law embeds in relations and distributions of power, and in what ways it allows for conflict resolution.[106]

### 4.2 A Developed Understanding of Adaptive Law

Soininen and Platjouw suggest a developed understanding of adaptivity, namely that it should be granted a dual meaning in relation to the law. On the one hand, the law needs to be adaptive to changes and new knowledge. In that aspect, legal certainty may be a hindrance. The theoretical conceptions of rule of law aim to impose certainty on a social-ecological reality that is uncertain by, *inter alia*, crafting: legal rules for withstanding unexpected environmental, social, economic, and cultural changes; strict procedural rules concerning evaluating evidence and the burden of proof; as well as strict criteria for legal argumentation.[107] On the other hand, the management of social-ecological systems needs to be adaptive to the law. The functions of predictability and permanence are required in certain situations, as opposed to always requiring adaptivity.[108] It is essential mainly in relation to three aspects, namely

1) to safeguard legitimate expectations of different actors,
2) to control administrative and judicial powers, and
3) to effectively drive change.[109]

Without these functions, neither knowledge of nor changes to the law will effectively contribute

[102] Ibid. 110–112.
[103] Ibid. 114, with references to Arnold and Gunderson (n 97) 10436, and JB Ruhl, 'General Design Principles for Resilience and Adaptive Capacity in Legal Systems – with Applications to Climate Change Adaptation' (2011) 89(5) North Carolina Law Review 1373, 1393.
[104] Humby (n 55) 114, with reference to Arnold and Gunderson (n 97) 10440.
[105] Soininen and Platjouw (n 33) 29.
[106] Humby (n 55) 129.
[107] Soininen and Platjouw (n 33); Niko Soininen, 'Torn by (Un)Certainty – Can There Be Peace Between Rule of Law and Other Sustainable Development Goals?' in Duncan French and Louis J Kotzé (eds), *Sustainable Development Goals: Law, Theory and Implementation* (Edward Elgar 2018) 269.
[108] Soininen and Platjouw (n 33) 29.
[109] Ibid. 25.

to social-ecological resilience.[110] Thus, the rule of law and legal certainty may be crucial for adaptation of social behaviour, and subsequently for ensuring resilience capacity. With this perspective, adaptivity should not only mean that the law should be adaptive in relation to dynamics 'external' to the law, but that human behaviour should be adaptive to requirements of the law. Put simple, 'law should be a careful combination of adaptivity and certainty, rule of science and rule of law'.[111]

### 4.3 Establishing Evaluative Criteria

While general perspectives of social-ecological resilience theory and adaptive law have been presented in previous sections, more concrete tools are needed for evaluating EU pesticides law. Soininen and Platjouw identify a number of legal features that contribute to the adaptive and resilience capacity of the law. In light of this, they suggest a number of specific criteria for measuring the resilience and adaptivity of environmental regulatory instruments. These criteria are identified through a synthesis of the main observations and requirements put forward in academic literature and policy documents on 'law and resilience'.[112] Divided into four categories, these are:

| |
|---|
| **1. Substance** |
| a. Plurality of goals, or goals of narrow scope coupled with exemptions |
| b. Discretion to adjust management in the light of new scientific understanding |
| **2. Procedure** |
| a. Increasing knowledge |
| b. Iteration |
| c. Crossing sectoral, jurisdictional and public/private boundaries |
| d. Access to information and justice |
| **3. Instrument Choice** |
| a. Direct regulation coupled with economic and voluntary instruments |
| **4. Enforcement** |
| a. Legally binding and specific obligations to achieve procedural and substantive goals |
| b. Time limits for goals |
| c. Sanctioning of non-compliance |

These criteria do not address all aspects that may be of relevance in evaluating the resilience capacity of EU pesticides law. However, they are based upon, and include, central aspects of the resilience perspective which are of relevance in a legal context. Thus, they should be able to provide an indication of the resilience and adaptive capacity of EU pesticides law.

In the following section, the fundamentals of Regulation 1107/2009 (PPP Regulation) and Directive 2009/128/EC (SUD) are presented. The PPP Regulation and the SUD are then evaluated against the adaptive law criteria presented

[110] Ibid. 26.

[111] Ibid. 25–26.

[112] Ibid. 26. In the discussion preceding the suggested criteria, references are made, inter alia, to Craig (n 100); Arnold and Gunderson (n 97); Jan McDonald and Megan C Styles, 'Legal Strategies for Adaptive Management under Climate Change' (2014) 26(1) Journal of Environmental Law 25; Ruhl (n 103); Andrea M Keesen and Helena FMW van Rijswick, 'Adaptation to Climate Change in European Water Law and Policy' (2012) 8 Utrecht L Rev 38; Lorenzo Squintani and Helena van Rijswick, 'Improving Legal Certainty and Adaptability in the Programmatic Approach' (2016) 28(3) Journal of Environmental Law 443; Katherine Pasteur, *From Vulnerability to Resilience. A Framework for Analysis and Action to Build Community Resilience* (Practical Action Publishing 2011); Froukje Maria Platjouw, 'Marine Spatial Planning in the North Sea – Are National Policies and Legal Structures Compatible Enough? The Case of Norway and the Netherlands' (2018) 33(1) The International Journal of Marine and Coastal Law 34; Soininen (n 107); Hans Christian Bugge, 'Twelve Fundamental Challenges in Environmental Law' in Christina Voigt (ed), *Rule of Law for Nature: New Dimensions and Ideas in Environmental Law* (Cambridge University Press 2013) 3; Ebbesson (n 86); Barbara Cosens, 'Transboundary River Governance in the Face of Uncertainty: Resilience Theory and the Columbia River Treaty' (2010) 30 J Land Resources & Envtl L 229.

above. More specifically, the provisions of these instruments are read in light of the criteria and interpreted in accordance with the methods described above in section 2.4. The functions and characteristics that are found by this reading and interpretation are linked and compared with the functions and characteristics specified in the adaptive law criteria. The results are presented in regard to each criterion and followed by a conclusion on whether the criterion at hand should be considered to be reflected within these instruments.

### 4.4 Fundamentals of EU Pesticides Law

In short, the PPP Regulation lays down rules for authorising the sale of PPPs, as well as the use and control of these products. The authorisation process is carried out within a dual system, where the competence is split between EU level and Member State level. A PPP is usually made up of several components, where the component intended to give effect against pests is called 'active substance'.[113] Active substances are approved at EU level according to harmonised rules.[114] The same approval procedure is prescribed for safeners and synergists (chemicals used to reduce the effects of the PPP on certain plants and chemicals added to improve the functioning of the active substance of the PPP).[115] The PPP, the specific commercial product that contain active substances as ingredients, are authorised at Member State level.[116] The SUD sets out rules for the sustainable use of pesticides, including PPPs. In other words, the PPP Regulation and the SUD together lay down rules on both the pre-market and post-market phases of PPPs. As regards the relationship between them, the rules laid down in SUD should be 'complementary to, and not affect' the measures of the PPP Regulation.[117]

This regulatory package is informed by five normative principles for risk assessment and management, namely

1. hazard identification,
2. precaution,
3. substitution,
4. sustainability, and
5. mutual recognition.

The assessment of active substances is guided by a hazard-based approach. Hazard is defined as the intrinsic potential of a substance to cause harm.[118] A hazard-based approach essentially means that there are risks that are unacceptable and consequently should not be taken, even though it is unlikely that harmful effects or accidents will occur.[119] The PPP Regulation identifies seven hazards that are considered unacceptable, referred to as 'cut-off criteria'. If an active substance meets any of these criteria, it is banned without any further assessment of the likelihood of harmful effects to occur.[120]

This hazard-based approach goes hand in hand with the precautionary principle. This principle is put forward as a key norm in both the PPP Regulation and the SUD.[121] A basic understanding of this principle is that regulatory action should be taken, and that it should aim to reduce potential harm, when there is scientific

[113] PPP Reg, art 2.2.
[114] Ibid. art 13.
[115] Ibid. art 25.
[116] Ibid. art 28.1.
[117] SUD, recital 3.
[118] Bozzini (n 3) 30, with reference to Commission, 'Communication from the Commission to the European Parliament and the Council on endocrine disruptors and the draft Commission acts setting out scientific criteria for their determination in the context of the EU legislation on plant protection products and biocidal products' COM (2016) 350 final, 7.
[119] Bozzini (n 3) 30; Ragnar E Lofstedt, 'Risk versus Hazard – How to Regulate in the 21 st Century' (2011) 2(2) European Journal of Risk Regulation 149, 149.
[120] Bozzini (n 3) 30–31; PPP Reg, Annex II 3.6–10.
[121] PPP Reg, art 1.4; SUD, art 2.3.

uncertainty over risks associated with a certain product and it is not possible to establish whether using the product is safe.[122]

The EU has not only taken regulatory action in regard to the pre-market stage of PPPs, but also to the post-market phase, i.e. the whole 'pesticide chain'. The overarching aims of regulating the post-market stage are to phase out chemicals of concern by substituting them with safer alternatives – as well as to reduce the overall use of pesticides. The principle of substitution is endorsed in the PPP Regulation which obligates the Commission to list active substances of concern. Despite legally being deemed safe, these substances are considered to come with risks that might be difficult to handle, hence they are considered 'candidates for substitution'.[123]

The principle of substitution is expected to contribute to the overall aim of EU pesticides regulation to achieve the sustainable use of pesticides. This aim is the specific goal of the SUD. The main tool for achieving this goal is obligating the Member States to adopt National Action Plans (NAPs), including quantitative objectives, targets, measures, timetables and indicators for achieving a sustainable use of pesticides.[124] The SUD also contain specific provisions, *inter alia*, prohibition of aerial spraying and promotion of Integrated Pest Management (IPM).[125]

Finally, EU pesticides regulation is informed by a peculiar version of mutual recognition. The meaning of this principle is, shortly, the acceptance by Member States of rules and standards adopted by other Member States as equivalent to their own.[126] In relation to PPPs, authorisations by one Member State shall be accepted by other Member States where 'agriculture, plant health and environmental (including climatic) conditions are comparable'.[127] This differs with the standard version of mutual recognition, whereby national rules are deemed equivalent across all Member States. Instead, as concerns PPPs, the Union is divided into three zones – north, centre, and south – and within each, the principle of mutual recognition applies.[128]

### 4.5 Substance

#### *4.5.1 Plurality of Substantive Goals*

Within social-ecological resilience theory, diversity is generally emphasised as an important feature for resilience building. Broadly, diversity refers to the different numbers of components, as well as the level of heterogeneity among components, within social-ecological systems. The reason for the endorsement of diversity is that it is suggested to provide options for responding to change and disturbance.[129] Soininen and Platjouw put forward plurality and diversity as important in regard to the goal (or goals) attached to a regulatory instrument. They suggest that the substantive goals should simultaneously acknowledge environmental, social and economic aspects.[130] At the same time, the goals should be

[122] Bozzini (n 3) 33.
[123] Ibid. 39; PPP Reg, art 24.
[124] SUD, art 4.1.
[125] SUD, arts 9 and 14. IPM is a set of practices, centred around reduction of chemical use, and anticipation and prevention of pests, varying depending on the local conditions (Bozzini (n 3) 42; SUD, art 3.6).
[126] Bozzini (n 3) 43.
[127] PPP Reg, art 40.
[128] Bozzini (n 3) 43; PPP Reg, Annex I.
[129] Karen Kotschy and others, 'Principle 1 – Maintain Diversity and Redundancy' in Reinette Biggs, Maja Schlüter and Michael L Schoon (eds), *Principles for Building Resilience: Sustaining Ecosystem Services in Social-Ecological Systems* (Cambridge University Press 2015) 50–51, with references to Carl Folke, Johan Colding and Fikret Berkes, 'Synthesis: Building Resilience and Adaptive Capacity in Social-Ecological Systems' in Fikret Berkes, Johan Colding and Carl Folke (eds), *Navigating Social-Ecological Systems: Building Resilience for Complexity and Change* (Cambridge University Press 2003) 352; Walker and Salt (n 27); Jon Norberg and Graeme Cumming, *Complexity Theory for a Sustainable Future* (Columbia University Press 2008).
[130] Soininen and Platjouw (n 33) 26.

clear so that the legality of management measures can be judged against the goals.[131] Two suggestions are put forward on how to achieve this. One alternative is to have narrow goals, e.g. ones that are only related to ecological factors, not taking social factors into consideration. These should then be coupled with an exemption regime, in order to handle conflicts with other goals and regulatory instruments. A second option is to formulate goals that are so broad at the outset that they are able to address conflicts between ecological and social considerations.[132]

Reflecting upon this criterion, one may ask, to begin with, how compatible substantive goals of diverse character actually are with the requirement of clear goals. Furthermore, considering the 'planetary boundaries' perspective with certain ecological thresholds, there may be conflicts where it will be required to grant environmental considerations primacy. It is observed that when priorities have to be made between multiple goals, economic considerations tend to trump ecological conservation.[133] A resilience perspective does not require that environmental considerations should be granted primacy in all conflicts.[134] Nevertheless, the resilience perspective acknowledges that there are ecological limits to the social systems, and consequently that there may be situations when there is a need to limit social activities to keep social-ecological systems within a particular state of stability.[135] Arguably, only having a plurality of substantive goals, or diverse substantive goals, does not automatically incorporate these insights into the regulatory goals.

Leaving this reflection, one can conclude that together, the PPP Regulation and the SUD have a diverse set of goals where ecological objectives are coupled with social objectives. The purpose of the PPP Regulation is to 'ensure a high level of protection of both human and animal health and the environment and to improve the functioning of the internal market (…) while improving agricultural production'.[136] As regards the goal of the SUD, it is shortly stated 'this Directive establishes a framework to achieve a sustainable use of pesticides (…).[137] Together these goals are so broad that they are, at the outset, able to address conflicts between ecological and social considerations.

From the wording of the provision stating the goals of the PPP Regulation, all goals appear to be on an equal standing. However, that seems to not actually be the intention of the EU legislator. It is expressed that the aim to 'ensure a high standard of protection' implies 'in particular, when granting authorisations of plant protection products, the objective of protecting human and animal health and the environment should take priority over the objective of improving plant production'.[138] This expression, indicating a certain hierarchy between the goals, could possibly constrain the plurality and diversity of the goals and subsequently reduce the Regulation's capacity of flexibility and adaptivity.

Moreover, the goals of the PPP Regulation and the SUD are general and ambiguous. The wording of the goals cannot be considered precise and clear. By turning to interpretative aids, such as recitals, and by employing systemic and teleological methods of interpretation, these goals may be clarified to some extent.[139] Despite

131 Ibid.
132 Ibid.
133 Marilyn Averill, 'Introduction: Resilience, Law and Natural Resource Management' (2008) 87(4) Nebraska Law Review 821, 824–825.
134 Humby (n 55) 109, with reference to Arnold and Gunderson (n 97) 10438.
135 Humby (n 55) 109.
136 PPP Reg, art 1.3.
137 SUD, art 1.
138 PPP Reg, recital 24.
139 See e.g. Ibid., recital 8–9, and SUD, recital 22.

this, a considerable amount of vagueness remains.

To conclude, the plurality in the substantive goals indicates adaptive capacity of these legal instruments. At the same time, the ambiguity of the goals will likely make it complicated to judge the legality of management measures taken. The lack of clarity could also make enforcement of the goals challenging, which in turn could hamper adaptivity of human activity to requirements of the law.

*4.5.2 Discretion to Adjust Management in the Light of New Scientific Knowledge*

According to social-ecological resilience theory, the knowledge of social-ecological systems is partial and incomplete. Revising existing knowledge is continuously needed in order to enable adaptation to change.[140] In this light, encouragement of learning is put forward as a key principle for building resilience in social-ecological systems. Evidence suggests that if governance and decisions-making are influenced by learning, the resilience of desired functions and values, such as ecosystem services, may be enhanced.[141] Accordingly, adaptive law theory often suggests flexible standards, or principles, that allow managers discretion to consider the insights of new scientific knowledge.[142]

Several provisions that allow for adjustment of management measures in the light of new scientific knowledge are included in the PPP Regulation. To begin with, it is laid down that

> 'the Commission may review the approval of an active substance at any time. It shall take into account the request of a Member State to review, in the light of new scientific and technical knowledge and monitoring data, the approval of an active substance, including where, after the review of the authorisations pursuant to Article 44(1), there are indications that the achievement of the objectives established in accordance with Article 4(1)(a)(iv) and (b)(i) and Article 7(2) and (3) of Directive 2000/60/EC is compromised. (…) Where the Commission concludes that the approval criteria provided for in Article 4 are no longer satisfied, or the further information required in accordance with Article 6(f) has not been provided, a Regulation to withdraw or amend the approval shall be adopted (…).'[143]

With regards to renewals of approvals, it is specifically pointed out in the recitals that 'experience gained from the actual use of plant protection products containing the substances concerned' and 'any developments in science and technology' should be taken into account when a decision is taken regarding the renewal of an approval.[144]

There is also a review clause regarding authorisations of PPPs. It similarly reads that

> 'Member States may review an authorisation at any time where there are indications that a requirement referred to in Article 29 is no longer satisfied. (…) The Member State

[140] Georgina Cundill and others, 'Principle 5 – Encourage Learning' in Reinette Biggs, Maja Schlüter and Michael L Schoon (eds), *Principles for Building Resilience: Sustaining Ecosystem Services in Social-Ecological Systems* (Cambridge University Press 2015) 175, with references to Walker and Salt (n 27); F Stuart Chapin and others (eds), *Principles of Ecosystem Stewardship: Resilience-Based Natural Resource Management in a Changing World* (Springer Science & Business Media 2009).

[141] Cundill and others (n 140) 174.

[142] Arnold and Gunderson (n 97) 10436.

[143] PPP Reg, art 21.1 and 21.3. To clarify, Directive 2000/60/EC (the EU Water Directive) concerns good-quality water in Europe, inter alia laying down rules to stop the deterioration of EU water bodies, while Art 44(1) concerns the authorisation of PPPs.

[144] PPP Reg, recital 15.

> shall withdraw or amend the authorisation, as appropriate, where: (…) (d) on the basis of developments in scientific and technical knowledge, the manner of use and amounts used can be modified (…).'[145]

The PPP Regulation also lays down that 'emergency measures', i.e. measures to restrict or prohibit the use and/or sale of an active substance or product shall be taken immediately,

> 'where it is clear that an approved active substance, safener, synergist or co-formulant or a plant protection product which has been authorized (…) is likely to constitute a serious risk to human or animal health or the environment.'[146]

Provisions allowing for consideration of new scientific knowledge are also found in the SUD. It is stated that measures shall be adopted to amend non-essential elements of the Directive, in order to take account of scientific and technical progress.[147]

To conclude these instruments, and especially the PPP Regulation, allow for consideration of new scientific knowledge and adjustment of governance measures in light of such new knowledge. This includes the measures of approval of active substances and authorisation of PPPs, which is the primary means for achieving the goals set out in the Regulation. Consideration of new scientific knowledge is also allowed in regard to measures for achieving sustainable use of pesticides. The inclusion of these functions in these instruments should contribute to their resilience and adaptive capacity.

### 4.6 Procedure

#### *4.6.1 Increasing Knowledge and Iterative Management*

In light of learning being a key principle for resilience building (see previous section), the law needs to provide tools and procedures for enabling this. Accordingly, iterative management processes that facilitate learning are put forward.[148] It is deemed essential that constant monitoring of the environmental media, and the human pressures affecting these, are included in these procedures.[149]

The PPP Regulation and the SUD lay down procedures for knowledge generation through the monitoring of both the environmental media, including human health, as well as the human pressures affecting them (the usage of pesticides). Regarding increasing knowledge, the PPP Regulation, inter alia, lays down that producers of PPPs are obliged to carry out post-authorisation monitoring if requested by the competent authority.[150] They shall also provide all data relating to the volume of sales of PPPs, in accordance with EU legislation concerning statistics on PPPs.[151] Moreover, the holder of a PPP authorisation is obligated to notify the Member State of any new information, regarding the PPP or the components included in it, suggesting that the PPP no longer complies with the authorisation criteria, or that the active substance no longer complies with the approval criteria.[152] For this purpose, the authorisation holder is required to record and report all suspected adverse reactions in humans, animals and the environment related to the use of the PPP. This obligation to notify includes relevant information from decisions or assessments by international organisations or by

[145] Ibid. arts 44.1 and 44.3.
[146] Ibid. arts 69–71.
[147] SUD, arts 5.3, 8.7, 14.4 and 15.1.
[148] Soininen and Platjouw (n 33) 26.
[149] Craig (n 100) 40–43.
[150] PPP Reg, art 67.2.
[151] Ibid. art 67.3.
[152] Ibid. art 56.1.

public bodies which authorise PPPs in non-EU countries.[153] The holder of an authorisation shall, once a year, report to the competent authorities if the holder has any information available that relates to: lack of expected efficacy; development of resistance; or any unexpected effects on plants, plant products or the environment.[154] Finally, professional users of PPPs should keep records of the PPPs that they use, including the time and dose of application, as well as the area where and the crop on which the PPP was used. These records should be kept for at least three years and be made available upon request to the competent authority.[155]

The SUD obligates Member States to adopt NAPs in order to achieve sustainable use of pesticides. These shall include indicators to monitor the use of PPPs containing active substances of particular concern.[156] Member States shall calculate harmonised risk indicators, identify trends in the use of certain active substances, and identify priority items such as substances, crops, regions, or practices that require particular attention. The Member States shall communicate these results to the Commission and to other Member States, as well as make them available to the public.[157] Furthermore, Member States are obligated to 'put in place systems for gathering information on pesticide acute poisoning incidents, as well as chronic poisoning developments where available, among groups that may be exposed regularly to pesticides such as operators, agricultural workers or persons living close to pesticide application areas'.[158]

The feature of iteration is reflected in regard to the fundamental means of the PPP Regulation. There are structures for reviewing management measures, such as time-limited approvals and authorisations with subsequent renewal procedures.[159] Regarding iteration of the processes of the SUD, it is laid down that the NAPs should be reviewed, at least every five years.[160] As concerns certain features of the NAPs, Member States are obligated to establish procedures for the granting, renewal, and withdrawal of training certificates.[161] This implies iteration of the learning processes prescribed for professional users, distributors, and advisors. At the EU level, one may note that the Commission shall 'regularly submit to the European Parliament and to the Council a report on progress in the implementation of this Directive, accompanied where appropriate by proposals for amendments'.[162]

To sum up, the PPP Regulation and the SUD lay down procedures for knowledge generation through monitoring of the environmental media, including human health, as well as of the activity of pesticides usage. The feature of iteration is reflected in regards of the fundamental means of the PPP Regulation and in relation to the NAPs. Without judging on the efficacy of this knowledge generation and iteration, one can conclude that these functions are reflected within these instruments. Thus, these instruments meet the criteria of both 'increasing knowledge' and of 'iterative management', which is considered to contribute to their resilience and adaptive capacity.

#### *4.6.2 Crossing Sectoral, Jurisdictional and Public/Private Boundaries*

In resilience research, managing connectivity is put forward as a key principle. Connectivity refers to the way that parts of social-ecological sys-

153 Ibid.
154 Ibid. art 56.4.
155 Ibid. art 67.1.
156 SUD, art 4.2.
157 Ibid. art 15.2–3.
158 Ibid. art 7.2.
159 PPP Reg, arts 5, 14.2, 25.2. and 32.1.
160 SUD, art 4.2.
161 Ibid. art 5.2.
162 Ibid. art 16.

tems interact with each other. Looking at social systems, this could, *inter alia*, mean the exchange of information between individuals, organisations, and governing bodies. The links between different entities could also take the form of, *inter alia*, trust, opinion, ideas, transfer of resources, rules, norms, and decisions.[163] Connectivity is assumed to be necessary to facilitate the flow of information needed for resilience building of social-ecological systems. The strength and structure of connectivity may affect the possibility to safeguard core functions of the systems against disturbances, by facilitating recovery or constraining the spread of disturbance.[164] Soininen and Platjouw's suggested criterion 'crossing sectoral, jurisdictional and public/private boundaries' may be understood against this background. They more specifically link this criterion to long-term planning processes and suggest that these processes should be closely linked to substantive regulatory goals and environmental management practices, as well as be integrated and connected across environmental media, sectors, interests, and governments.[165]

In short, the approval process of active substances, safeners, and synergists is mostly concentrated at the EU level, while the authorisation process of PPPs, and the planning for achieving a sustainable use of pesticides, are concentrated at the Member State level. EU institutions and national authorities are however involved in both of these processes.[166] It is also allowed for participation of other Member States than the one receiving an approval application or an authorisation application.[167] Participation of both the industry and the public is allowed with regards to the approval process of active substances, safeners, and synergists, as well as the adoption of NAPs.[168] In the adoption of NAPs, interests related to other sectors, as well as all stakeholder groups shall be taken into account.[169] In other words, participation across scales, including various actors, sectors and interests, is allowed in many stages of the processes laid down in these instruments. However, such inclusion is not always ensured, e.g. by compulsory inclusion of other relevant sector authorities in the approval and authorisation processes.

To sum up jurisdictional boundaries are clearly crossed in the processes of this regulatory package, while crossing of sectors and public/private boundaries are allowed for but not always ensured. In light of this, this evaluative criterion may be considered largely fulfilled, while there is still room for improvement. These functions, as currently laid down, contribute to the adaptive and resilience capacity of these instruments. However, it is possible to improve these functions to further enhance adaptive and resilience capacity.

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[163] Vasilis Dakos and others, 'Principle 2 – Manage Connectivity' in Reinette Biggs, Maja Schlüter and Michael L Schoon (eds), *Principles for Building Resilience: Sustaining Ecosystem Services in Social-Ecological Systems* (Cambridge University Press 2015) 81, 84.

[164] Ibid. 83, with reference to Magnus Nyström and Carl Folke, 'Spatial Resilience of Coral Reefs' (2001) 4(5) Ecosystems 406.

[165] Soininen and Platjouw (n 33) 27, with references to Craig (n 100) 53–63, and Keesen and van Rijswick (n 112) 41.

[166] PPP Reg, arts 7.1, 11.1–2, 13.1, 21.1–2, 33.1, 36.2–3, 79.1; SUD, arts 4.1–2, 15.1, 15.4; Regulation (EC) No 178/2002 of the European Parliament and of the Council of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety [2002] OJ L31/1, art 58.

[167] PPP Reg, arts 12.1 and 36.1.

[168] PPP Reg, art 12.1; SUD, arts 4.1, 4.5; Directive 2003/35/EC of the European Parliament and of the Council of 26 May 2003 providing for public participation in respect of the drawing up of certain plans and programmes relating to the environment and amending with regard to public participation and access to justice Council Directives 85/337/EEC and 96/61/EC [2003] OJ L156/17, art 2.

[169] SUD, art 4.5.

*4.6.3 Access to Information*

Another key principle for resilience building is broadened participation. This refers to the active engagement of relevant stakeholders in management and governance processes.[170] This could mean anything from simply keeping stakeholders informed to complete devolution of power.[171] It is assumed that involving a diverse group of stakeholders will contribute to legitimacy and promote the understanding of the systems by expanding the depth and diversity of knowledge. Moreover, it is frequently argued that legitimacy, as an expression of trust, is the basis for compliance.[172] In this light, Soininen and Platjouw put forward the right to 'access to information and justice' for stakeholders, which may be understood against the principle of broadened participation and the importance of trust-building. The PPP Regulation and the SUD are evaluated against this criterion in both this and the following sections.

With regards to access to information under the PPP Regulation, it is, *inter alia*, laid down that the summary dossier, accompanying an application for approval of an active substance, safener, or synergist, shall without delay be made available to the public.[173] The applicant may request certain information and certain parts of the dossier to be kept confidential.[174] Information which has been requested to be confidential (and such treatment is justified in accordance with the Regulation) shall be excluded unless there is 'an overriding public interest in its disclosure'.[175] The draft assessment report of the approval procedure shall be made available to the public after giving the applicant two weeks' time to request that certain parts of the report should be kept confidential.[176] The conclusion, adopted during the approval procedure on whether the active substance at issue can be expected to meet the approval criteria, shall also be made available to the public.[177] Finally, the Commission should maintain a list of approved active substances available to the public electronically.[178]

In regards of authorisations of PPPs, it is, *inter alia*, laid down that Member States shall keep information on authorised or withdrawn PPPs available to the public electronically.[179] As concerns the authorisation process, Member States shall keep, and make available upon request to any interested party, a list of the test and study reports concerning the active substance, safener, or synergist, adjuvants and the PPP, which were necessary for first authorisation, amendment of the authorisation conditions, or renewal of the authorisation.[180] Finally, one may note that third parties, such as drinking water industry, retailers, and residents, may request access to the information of the records on production, importation, exportation, storage, or placing on the market of PPPs. This also applies with regard to the records on the use of PPPs, including time

[170] Anne M Leitch and others, 'Principle 6 – Broaden Participation' in Reinette Biggs, Maja Schlüter and Michael L Schoon (eds), *Principles for Building Resilience: Sustaining Ecosystem Services in Social-Ecological Systems* (Cambridge University Press 2015) 203, with reference to Lindsay C Stringer and others, 'Unpacking "Participation" in the Adaptive Management of Social-ecological Systems: a Critical Review' (2006) 11(2): 39 Ecology and Society.

[171] Leitch and others (n 170) 201.

[172] Bohman (n 29) 314, with reference to Thomas M Franck, 'Legitimacy in the International System' (1988) 82(4) American Journal of International Law 705.

[173] PPP Reg, art 10.

[174] Ibid. art 7.3. However, this is without prejudice to Directive 2003/4/EC which concerns public access to environmental information, (PPP Reg, art 63.3; Directive 2003/4/EC of the European Parliament and of the Council of 28 January 2003 on public access to environmental information and repealing Council Directive 90/313/EEC [2003] OJ L41/26).

[175] PPP Reg, art 10.

[176] Ibid. art 12.1.

[177] Ibid. art 12.2.

[178] Ibid. art 13.4.

[179] Ibid. art 57.

[180] Ibid. art 60.2.

and dose of application, as well as area and crop on which the PPP was used. The competent authorities shall provide access to this information in accordance with applicable national law or EU law.[181]

As concerns the SUD, the Member States should make the information on their NAPs that they communicate to the Commission and other Member States available online to the public.[182] Moreover, the provisions on public participation laid down in article 2 of Directive 2003/35/EC shall apply to the preparation and the modification of the NAPs. These provisions include, inter alia, obligations to ensure that the public is informed about any proposals and that relevant information about such proposals is made available.[183] As regards information on the risks and monitoring of pesticide usage, this information shall be made available to the public. The risk indicators calculated by the Commission at EU level shall also be made available online to the public.[184] Finally, one may note that the Member States should take measures to inform the general public, in particular regarding the risks and potential harmful effects of pesticide usage.[185]

To conclude, apart from acknowledging commercial interests among producers to keep certain information confidential, the public, including stakeholders, is ensured access to information submitted under the PPP Regulation, as well as information concerning the NAPs of the SUD. Arguably, this evaluative criterion should be considered fulfilled.

#### *4.6.4 Access to Justice*

Looking into the function of access to justice for stakeholders, one should initially note that the Court of Justice of the European Union (the CJEU) is granted competence to review the legality of legislative acts by the Commission, including approvals or non-approvals of active substances, safeners, and synergists.[186] In the Treaty on the Functioning of the European Union (TFEU), it is laid down that any natural or legal person may institute proceedings against an act addressed to that person or which is of direct and individual concern to them, and against a regulatory act which is of direct concern to them and does not entail implementing measures.[187]

As concerns the approval of active substances, this has been interpreted several times by the Courts of the European Union, to mean that

> 'a notifier of an active substance, having submitted the dossier and participated in the assessment procedure, is individually concerned as much by a measure authorising the active substance subject to conditions as by a measure refusing authorisation.'[188]

It was recently laid down that 'the same analysis must be considered to apply in principle where the measure in question withdraws or restricts the approval of the active substance'.[189] As concerns the standing of other producers of a substance at issue, other than the notifier, the possibility of access to justice appears more limited. In a recent judgement, action was brought

[181] Ibid. art 67.1.
[182] SUD, art 4.4.
[183] Ibid. art 4.5; Dir 2003/35/EC, art 2.
[184] SUD, art 15.4.
[185] Ibid. art 7.1.

[186] Consolidated Version of the Treaty on the Functioning of the European Union [2012] OJ C326/1 (hereinafter TFEU), art 263.
[187] Ibid.
[188] Cases T-429/13 and T-451/13 *Bayer CropScience AG and Others v European Commission* [2018] ECLI:EU:T:2018:280, para 70, with references to Cases T-326/07 *Cheminova and Others v Commission* [2009] ECLI:EU:T:2009:299, para 66, and T420/05 *Vischim v Commission* [2009] ECLI:EU:T:2009:391, para 72, and T483/11 *Sepro Europe v Commission* [2013] ECLI:EU:T:2013:407, para 30.
[189] Case T584/13 *BASF Agro BV and Others v European Commission* [2018] ECLI:EU:T:2018:279, para 45.

by an association of producers of copper compounds against a Regulation that included copper compounds on the list of candidates for substitution.[190] The members of this association were considered to be concerned by the Regulation at issue

> 'only in their objective capacity as producers of copper compounds, and thus in the same capacity as any other economic operator actually or potentially in an identical situation, and that they were not therefore individually concerned by the regulation at issue.'[191]

Their appeal was hence considered inadmissible.[192] One may note that individual parties wishing to review EU legislation have an additional option through indirect judicial review. This means that judicial review can be brought as part of a preliminary ruling procedure under article 267 of the TFEU on any Union act, on any grounds, and by anyone, i.e. there are no requirements for direct and individual concern.[193] Nevertheless, there are limitations set by the preliminary ruling procedure. Individuals have no 'right' to demand indirect review if a national court considers it clear that the act at issue is valid.[194]

The situation is rather different for Member States, the European Parliament, the Council, and the Commission. They always have the right to initiate a judicial review of legislative acts, including approvals or non-approvals of active substances, safeners, or synergists.[195]

As concerns that authorisation of PPPs, Member States are obligated to provide for the possibility to challenge – before national courts or other instances of appeal – a decision to refuse the authorisation of a PPP.[196]

As concerns access to justice in relation to the right to access to information, no specific provisions are laid down either in the PPP Regulation, or in the SUD. However, it is laid down in the PPP Regulation that the provision laid down therein, which make it possible to keep information submitted under the Regulation confidential, apply without prejudice to Directive 2003/4/EC, which concerns public access to environmental information.[197] This Directive obligates Member States to ensure access to justice for applicants requesting information.[198]

To conclude, access to justice for certain stakeholders, namely applicants for approval of an active substance, safener, or synergist, or applicants for authorisation of a PPP, is ensured through these instruments or within the wider legal structure of the Union. This also includes access to justice for Member States and several EU institutions. However, the group of stakeholders with interests in agricultural pesticide usage may be considered to be wider than that. This includes, inter alia: the chemical industries; the agricultural industries (including farmers); as well as public interest groups (e.g. groups working for environmental protection and consumer protection).[199] In this light, stakeholders' access to justice in relation to management measures under these instruments may be considered as limited. Due to limited access to justice in relation to the main means of the PPP and the SUD, this criterion is arguably not fulfilled. This lack of access to justice is assumed to hamper adaptive and resilience capacity of these legal instruments.

[190] Case C-384/16 P *European Union Copper Task Force v European Commission* [2018] ECLI:EU:C:2018:176.
[191] Ibid. para 97.
[192] Ibid. para 122.
[193] TFEU, art 267.
[194] Schütze (n 38) 365.
[195] TFEU, art 263.
[196] PPP Reg, art 36.3.
[197] PPP Reg, art 63.3; Dir 2003/4/EC.
[198] Dir 2003/4/EC, art 6.
[199] Bozzini (n 3) 47.

### 4.7 Instrument Choice

#### *4.7.1 Direct Regulation Coupled with other Policy Instruments*

Diversity is generally put forward as a key principle for building resilience in social-ecological systems (see above section 4.5.1). The suggestion that direct legal regulation should be coupled with other types of policy instruments may be understood against this background. Direct legal regulation may be defined as directly applicable rules of conduct. These are sometimes referred to as 'command and control' rules, since they concern how humans should act, i.e. they contain a kind of 'command'.[200] A characteristic of 'command and control' is that 'very little, if anything, is left for the addressee of the law to variate'.[201] From a resilience perspective, other types of policy instruments – in particular economic instruments but also purely voluntary instruments, such as measurements for spreading of information – are deemed crucial as complements to direct legal regulation. The rationale behind this call is that a diverse mix of policy instruments may foster innovative responses to changes and pressures within social-ecological systems.[202]

Since having the form of a Regulation, the PPP Regulation is binding in its entirety and directly applicable in all Member States.[203] It prescribes whether, when, and how the authorisation of PPPs shall be carried out. It also lays down prescriptions on the use and control of PPPs. Thus, it represents a typical 'command and control' approach, and consequently has the character of direct legal regulation.

The SUD differs in character from the PPP Regulation. Directives are generally binding only to the ends to be achieved, while leaving discretion to the Member States to choose the form and method they use to achieve these ends.[204] In the recitals of the SUD, complementary policy measures are generally acknowledged in the governing of pesticide usage. More specifically, it is stated that

> 'economic instruments can play a crucial role in the achievement of objectives relating to the sustainable use of pesticides. The use of such instruments at the appropriate level should therefore be encouraged while stressing that individual Member States can decide on their use without prejudice to the applicability of the State aid rules.'[205]

To conclude, economic policy instruments are explicitly encouraged but not directly coupled with either the PPP Regulation or the SUD. To some extent, the SUD goes beyond direct legal regulation by obligating Member States to take certain measures in order to achieve certain ends, but leaving the Member States to decide the exact content and forms of these measures. Nevertheless, these two instruments arguably do not make up a diverse mix of policy instruments. Since they are not coupled with economic or other voluntary policy instruments, the evaluative criterion at issue cannot be considered fulfilled. Due to this, potentially innovative responses to changes and pressures within social-ecological systems, related to agricultural pesticide usage, may be obstructed or hindered.

### 4.8 Enforcement

#### *4.8.1 Legally Binding and Specific Obligations to Achieve Goals; Time Limits for Goals; Sanctioning of Non-Compliance*

Social-ecological systems comprise of, and are affected by, a number of variables that change and

[200] Westerlund (n 29) 9, 29.
[201] Ibid. 32.
[202] Arnold and Gunderson (n 97) 10432–10436.
[203] Paul Craig and Gráinne De Búrca, *EU Law: Text, Cases, and Materials* (6 edn, Oxford University Press 2015) 107.
[204] Ibid. 108.
[205] SUD, recital 4.

interact on a range of timescales: slower or faster. Slow variables change much more gradually – this could be soil composition, social values, or legal systems; in comparison with faster variables, such as methods of crop production or allocation of financial resources.[206] Feedback is when change in a particular variable of a social-ecological system leads to changes in the system and then those changes eventually loop back, affecting the original variable.[207] The importance of managing especially slow variables and feedbacks is put forward in resilience research as a key principle for resilience building. Otherwise, certain thresholds may be crossed and a system may shift from one regime to another. This is often associated with large, rapid changes to ecological systems which in turn could have an immense impact on social systems. In light of this, the control and management of slow variables and feedbacks is considered essential for contributing to the capacity to maintain the desired functions of social-ecological systems, restore social-ecological systems to more desired states, or transform them to entirely new states.[208] Moreover, sanctioning systems, intended to ensure compliance by all actors, are considered vital for trust-building which, from a resilience perspective, is in turn important for maintaining institutional stability and continuity in management.[209] The criteria of legally binding and specific obligations to achieve goals, the setting of time limits within which to achieve these goals, and the sanctioning of non-compliance may all be understood from this perspective of social-ecological resilience theory.

Since it has the form of a regulation, the PPP Regulation is binding in its entirety and directly applicable in all Member States.[210] Detailed rules on the authorisation, use and control of PPPs are laid down in order to achieve the goals of the Regulation. As concerns the SUD, since it takes the form of a Directive, it is binding only in regard to the results to be achieved, and only upon the Member States to which it is addressed.[211] This Directive is addressed to the Member States, thus it is binding upon all Member States.[212] It contains specific obligations to adopt NAPs, including obligations on what should be included in these.[213]

The substantive goals of both instruments, however, lack time limits. As concerns the procedural goals, the means of the PPP Regulation are directly applicable, leaving no room for delay in implementation.[214] The procedural goal of the SUD to adopt NAPs is coupled with a certain deadline, and many of the other procedural goals of the SUD have time limits.[215]

As regards the sanctioning of non-compliance, Member States are obligated to lay down penalties applicable to infringements of the PPP Regulation.[216] A similar obligation is laid down in the SUD, obligating Member States to determine penalties applicable to infringements of national provisions adopted pursuant to the SUD.[217] Finally, if a Member State breaches the PPP Regulation, or fails to fulfil the obligations of the SUD, the Member State at issue may be brought before the CJEU either by the Commission or by another Member State.[218] In the scenar-

[206] Reinette Biggs and others, 'Principle 3 – Manage slow variables and feedbacks' in Reinette Biggs, Maja Schlüter and Michael L Schoon (eds), *Principles for Building Resilience: Sustaining Ecosystem Services in Social-Ecological Systems* (Cambridge University Press 2015) 109.
[207] Ibid.
[208] Ibid. 105.
[209] Bohman (n 29) 314, with reference to Franck (n 172).
[210] TFEU, art 288.
[211] Ibid.
[212] SUD, art 25.
[213] Ibid. arts 4–15.
[214] TFEU, art 288.
[215] SUD, arts 4.2, 5, 6, 7, 8, 14 and 17.
[216] PPP Reg, art 72.
[217] SUD, art 17.
[218] TFEU, arts 258–259.

io where a Member State fails to comply with a judgement of the CJEU financial sanctions may be imposed, if the Commission applies for such penalties.[219]

To conclude, two of these criteria, the binding and specific obligations, and the sanctioning of non-compliance, are to be considered fulfilled. The inclusion of these functions is assumed to contribute to the adaptive and resilience capacity of these instruments. The second criterion of time limits is only partly met, leaving room for improvements that could further enhance the adaptive and resilience capacity of these instruments.

## 5. Conclusions and Reflections

### 5.1 Letting Social-Ecological Resilience Theory Inform EU Pesticides Law

The first research question of this article concerns how social-ecological resilience theory can inform the making of EU pesticides law. Within research, it is suggested that social-ecological resilience theory can serve as a tool for managing the interactions of social and ecological dynamics, such as those of agricultural production and ecosystems, so that the social-ecological systems can maintain core functions and continue developing. In the field at hand this could mean maintaining or even increasing capacity to provide food security for the current human population, whilst not ruining the prerequisites necessary for providing food security for future generations. More specifically, social-ecological resilience theory is focused on making social-ecological systems capable of coping with aspects such as change, pressure, shock, uncertainty, and complexity. These characteristics are significant for the phenomenon of pesticide usage while traditionally, legal systems and legal structures have struggled to deal with these factors. The aims of social-ecological resilience theory include handling impartial or incomplete knowledge, such as that of the impacts of pesticide usage on ecological systems, and the consequences of this lack of knowledge. In this light, social-ecological resilience theory can be used as a tool to address and handle these challenges mentioned in the making of EU pesticides law.

From the perspective of 'planetary boundaries', there are ecological thresholds that should not be transgressed so as to prevent the possibility of putting human well-being at risk. With great attention to critical thresholds, and the ability to continue developing, social-ecological resilience theory is relevant from a 'planetary boundary' perspective. However, while it does provide tools that may be essential for governing pesticide usage in such a way that 'planetary boundaries' are not transgressed, this theory lacks substantial concepts for guaranteeing that these thresholds are actually acknowledged. For example, features such as flexibility, knowledge, participation, and enforcement may be necessary features of governance and the law, in order to avoid critical thresholds. However, these features do not *per se* ensure that the goals that are chosen within the regulatory field of agricultural pesticide usage, and subsequent governance measures, do not contribute to the transgression of 'planetary boundaries'. Trade-offs between interests will inevitably be influenced by the distribution of power among actors and between different preferences. Social-ecological resilience is promoted as a theory that takes social aspects into account. Nevertheless, it generally lacks attention to the issue of power, even though power influences the trade-offs inherent in the governing of social-ecological systems. Acknowledging this factor may be critical for keeping human activities, including pesticide usage, within ecological thresholds. These perspectives on the issue of power are relevant in relation to political decision-making but also in relation to the law.

[219] TFEU, art 260.

However, within adaptive law theory there also is a lack of attention to power. Adaptive capacity of the law is likely to be necessary to adjust human behaviour so as to stay within ecological thresholds. At the same time, adaptive capacity may provide adaptivity that favours the preference of environmental protection as well as the preference of environmental exploitation. From a 'planetary boundary' perspective, it is thus necessary to critically assess the effects of adaptive law features, as well as the effects of letting the principles of social-ecological resilience theory inform the law.

To conclude, social-ecological resilience theory may provide guidance on how to create EU pesticides law in a way that it does not obstruct but instead makes it possible to handle challenges of change, shock, pressure, uncertainty, and complexity related to pesticide usage. However, letting social-ecological resilience theory inform EU pesticides law may not be sufficient in itself to ensure that 'planetary boundaries' are not crossed. Social-ecological resilience can provide essential guidance on how to include features that are necessary for building resilience capacity – including ability to avoid transgression of ecological thresholds. Nevertheless, further theoretical perspectives, with attention to issues of power, are likely to be necessary to guarantee that such critical boundaries are not actually transgressed.

### 5.2 Adaptive and Resilience Capacity of EU Pesticides Law

The second and third research questions concern: whether adaptive capacity, contributing to social-ecological resilience, is currently reflected within EU pesticides law; and whether it can be increased, and if so in what aspects. The result of the evaluation of EU pesticides law against the chosen adaptive law criteria indicates that these instruments have largely good adaptive and resilience capacity. Out of 10 evaluative criteria 6 are fulfilled, 3 are partly fulfilled and 1 criterion is not fulfilled. More specifically, adaptive and resilience capacity is reflected in regards of substantive goals, management adjustment in the light of new scientific understanding, increasing knowledge, iteration of management processes, access to information, obligations to achieve procedural and substantive goals, and the sanctioning of non-compliance. These capacities identified within EU pesticides law are considered to contribute to features such as diversity, encouraging learning, broadened participation, and the management of slow variables and feedbacks, which are all considered key elements for building resilience within social-ecological systems. Adaptive capacity is however not reflected in regard to instrument choice and access to justice, and only partly reflected as concerns crossing sectoral, jurisdictional and public/private boundaries, as well as in regard to time limits for goals. In these aspects, it is possible to improve EU pesticides law to further contribute to features important for resilience building, *inter alia*: connectivity, broadened participation (including legitimacy), and the management of slow variables and feedbacks.

To conclude, adaptive capacity (as interpreted within the chosen evaluative criteria), contributing to social-ecological resilience, is largely reflected within the PPP Regulation and the SUD. This implies that EU pesticides laws contributes to the capacity to address and handle change, pressure, shock, uncertainty, and complexity related to the phenomenon of pesticide usage. This also indicates that these legal instruments can help balance the behaviour of social systems, such as pesticide application, with the behaviour of ecological systems, such as changes within ecosystems. This further implies the capacity to identify critical thresholds within the ecological systems, *ergo* enabling governance measures and

decisions to adjust human activities so that they do not transgress 'planetary boundaries'. Since there is room for improvement of the adaptive and resilience capacity of these instruments in certain aspects, this regulatory package should perhaps not be considered a role model for the making of laws having adaptive and resilience capacity. Nevertheless, these instruments may serve as valuable references in such processes.

One should finally note that this analysis and exploration of potential ways to improve EU pesticides law is largely theoretical. While adaptive and resilience capacity of these legal instruments is largely well reflected *de jure*, further analysis of a more empirical character is needed to provide knowledge of how, and in what ways, these instruments *de facto* contribute (or do not contribute) to the resilience of social-ecological systems. This may also shed further light on how features of adaptive law, in a broader perspective, contribute (or do not contribute) to the resilience of social-ecological systems.

# Vad är en plan? – En analys av Sveriges implementering av direktivet om strategisk miljöbedömning

*Henrik Josefsson**

**Sammanfattning**

Det strategiska miljöarbetet vid kommunal planläggning är centralt för att uppnå bland annat Sveriges miljömål. För att säkerställa att planers negativa miljöeffekter identifieras och hanteras ska planer som medför en betydande miljöpåverkan genomgå en strategisk miljöbedömning. Reglerna om strategiska miljöbedömningar härrör ur ett EU-direktiv och studien analyserar hur väl svensk rätt och direktivet stämmer överens, särskilt dess kärnbegrepp 'plan' och 'betydande miljöpåverkan'. Analysen identifierar en bristande implementering av direktivets begrepp och krav i den svenska planläggningslagstiftningen. Direktivets regler har genomförts genom ett befintligt planläggningssystem utan att det svenska systemet har anpassats för att säkerställa att det stämmer överens med direktivet. Ett centralt problem är hur direktivets 'plan'-begrepp har hanterats av den svenska lagstiftaren och begreppsskillnaden mellan systemen för med sig ett bristande genomförande av direktivet. Skillnaden mellan direktivet och svensk rätt får så stora konsekvenser att Sverige knappast kan sägas fullfölja sina EU-rättsliga förpliktelser inom detta område.

## 1. Inledning

Avsikten med miljöbedömningsinstrument är att integrera miljöaspekter i bland annat planläggning så att en hållbar utveckling främjas.[1] För att säkerställa att planers negativa miljöeffekter identifieras och hanteras ska planläggning som medför en betydande miljöpåverkan genomgå en strategisk miljöbedömning.[2] Att genomföra en strategisk miljöbedömning innebär att bland annat förluster av biologisk mångfald lättare kan undvikas, minimeras eller avhjälpas.[3] Miljöbedömningen är en viktig del i att försöka hantera biodiversitetskrisen och ta hänsyn till den biologiska mångfalden som en integrerad del av beslutsfattande som riskerar att negativt påverka arter, habitat och ekosystem. EU uppmanar också medlemsstaterna att inte bara kräva, exempelvis, kompensationsåtgärder vid skador på skyddad biologisk mångfald[4] utan också säkerställa att ingen nettoförlust sker av biologisk mångfald som helhet.[5] I bakgrunden till målet om ingen nettoförlust finns begrepp såsom ekosystemtjänster och naturkapital som uppmärksammar att biologisk mångfald är en samhällsresurs med stora ekonomiska värden.[6] Även om

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[1] 6:1 MB.

[2] 6:5–6 MB.

[3] 6:11 MB, 5 miljöbedömningsförordningen (MBF).

[4] Se Rådets direktiv 92/43/EEG av den 21 maj 1992 om bevarande av livsmiljöer samt vilda djur och växter, art. 6(4), och Europaparlamentets och rådets direktiv 2004/35/EG av den 21 april 2004 om miljöansvar för att förebygga och avhjälpa miljöskador, bilaga II.

[5] Se 'Communication from the Commission to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions, Our life insurance, our natural capital: an EU biodiversity strategy to 2020, COM/2011/0244 final/'.

[6] Ibid.

det finns flera rättsliga begrepp och verktyg med syfte att bidra till att stoppa förlusten av biologisk mångfald är miljöbedömningarna ett av de viktigaste i och med att de ger kunskap om både miljöeffekter och möjliga avhjälpande åtgärder.[7]

Reglerna om miljöbedömningar härstammar från två EU-direktiv, ett fokuserat på planer/program[8] och det andra på verksamheter/projekt (MKB-direktivet[9]). I fortsättningen kommer fokus att ligga på direktivet som omfattar miljöbedömningar av planer och program (SMB-direktivet).

Genomförandet av SMB-direktivet i svensk rätt har gått långsamt och dragits med genomförandeunderskott.[10] Möjligen är det en anledning till att frågan om planläggningslagstiftningen stämmer överens med direktivet och EU-domstolens klargöranden inte analyserats på djupet.[11] Artikeln analyserar implementeringen av direktivets kärnbegrepp, i huvudsak 'plan' och 'betydande miljöpåverkan' och de processuella krav som begreppen aktualiserar. För att undersöka detta har direktivet och svensk rätt studerats avseende vilka typer av planer som ska genomgå en strategisk miljöbedömning. Materialet som underbygger analysen är i huvudsak svenska och EU-rättsliga dokument, såsom praxis, förarbeten, SOU, rapporter, doktrin etc. Med utgångspunkt i SMB-direktivet och EU-domstolens praxis utforskas innebörden av begreppen 'plan' och 'betydande miljöpåverkan' och en referens för att utvärdera den svenska implementeringen skapas. Utifrån den referensen sker sedan en diskussion om huruvida det svenska planläggningssystemet återspeglar den EU-rättsliga förståelsen av begreppen och deras processuella krav.

Följande avsnitt kommer att beskriva SMB-direktivet och svensk rätt, i huvudsak miljöbalken (MB) och plan och bygglagen (PBL), med fokus på begreppen 'plan' och 'betydande miljöpåverkan'.[12]

## 2. Direktivet om strategiska miljöbedömningar

### 2.1 Inledning

Direktivet om strategiska miljöbedömningar tar sin utgångspunkt i EU-rättens mål om att gemenskapen ska bidra till att bevara, skydda och förbättra miljön.[13] Enligt förarbetena till direktivet är det tydligt att ett av grundsyftena med direktivet är att komplettera MKB-direktivet och säker-

[7] 'Avhjälpa' är här synonymt med kompensera. I den engelska språkversionen av direktivet används 'compensation'. För specifika miljöbedömningar används också avhjälpa trots att det nya MKB-direktivet använder begreppet 'motverka' och i den engelska, danska, franska respektive tyska översättningen används begreppen offset, neutralisere, compenser och ausgeglichen som alla avser kompensation. Se art. 5(1)(c); Prop. 2016/17:200, Miljöbedömningar, s. 130–131; https://www.naturvardsverket.se/Stod-i-miljoarbetet/Vagledningar/Miljobedomningar/Specifik-miljobedomning/Underlag-kompensation/.

[8] Europaparlamentets och Rådets Direktiv 2001/42/EG av den 27 juni 2001 om bedömning av vissa planers och programs miljöpåverkan.

[9] Europaparlamentets och Rådets Direktiv 2011/92/EU av den 13 december 2011 om bedömning av inverkan på miljön av vissa offentliga och privata projekt; Europaparlamentets och Rådets Direktiv 2014/52/EU av den 16 april 2014 om ändring av direktiv 2011/92/EU om bedömning av inverkan på miljön av vissa offentliga och privata projekt.

[10] Charlotta Faith-Ell, Jon Halling and Elina Baheram, 'Miljöhänsyn i detaljplanering – En studie av tillämpningen av bedömningar av betydande miljöpåverkan av detaljplaner i Svenska kommuner' (Naturvårdsverket 2015) Rapport 6671; Berit Balfors and others, *Strategisk miljöbedömning för hållbar samhällsplanering. Slutrapport från forskningsprogrammet SPEAK* (Rapport 6810, Naturvårdsverket 2018).

[11] För en analys av svensk rätt se Christina Hörnberg, 'Miljöbedömningar av planer och program i syfte att integrera miljöaspekter. En hållbarhetsstrategi utan krav på strategi?' (2016) 2016:1 Nordisk miljörättslig tidskrift 73.

[12] Konsekvent används de begrepp som idag återfinns i svensk lagstiftning och inte de begrepp som försvann i den senaste uppdateringen av 6 kap. MB.

[13] Se SMB-direktivet skäl 1 och Fördraget om Europeiska unionens funktionssätt art. 191.

ställa ett utökat/tidigare skydd för miljön genom att kräva miljöbedömningar av planer som riskerar att medföra betydande miljöpåverkan.[14] Den strategiska miljöbedömningen ses som ett viktigt verktyg som kompletteras av miljöbedömningar för projekt i och med att den strategiska bedömningen kan ske på ett tidigare stadium.[15] Fördelen att analysera miljöeffekterna, på bland annat biodiversitet, redan vid planläggning är att det ger möjligheter att i ett tidigt skede, och ofta på en större geografisk yta, beakta aspekter såsom negativa trender för arter eller kumulativ påverkan på särskilda habitat. På så sätt kan den specifika miljöbedömningen av projekt sättas in i en kontext där miljöeffekterna från projektet på ett lämpligt sätt kan relateras mot, exempelvis, andra följder av tidigare beslutade planer.[16]

För ett projekt som omfattas av en plan som genomgått en strategisk miljöbedömning kan processen medföra att exempelvis andra åtgärder för att minimera, förebygga och avhjälpa negativ miljöpåverkan krävs.[17] En anledning till att andra åtgärder kan övervägas är att den geografiskt begränsade prövningen av ett projekt utvidgas och kan sättas i det större sammanhang som planen omfattar. Utvidgningen kan medföra att fler alternativ undersöks redan på planläggningsstadiet av verksamheten samtidigt som det tvingar kommuner och myndigheter att på ett tidigt stadium undersöka miljökonsekvenser av exempelvis en bostadsexploatering eller ett industriområde. Även om mycket fokus ofta läggs på interaktionen mellan plan och projekt är det viktigt att komma ihåg att också planer kan ha miljökonsekvenser i sig om de i ett tidigt skede avgränsar mängden alternativ för efterföljande projekt eller planer.

SMB-direktivet utgår bland annat ifrån konventionen om biologisk mångfalds målsättning att så långt som möjligt och på lämpliga sätt integrera bevarandet och det hållbara nyttjandet av biologisk mångfald vid planläggning.[18] I linje med konventionen är direktivet processfokuserat och syftar till att integrera miljöaspekter i utarbetandet och antagandet av planer för att främja en hållbar utveckling. Direktivet ställer processen i centrum och det innehåller inte några målreferenser att beakta vid miljöbedömningen. Hur den biologiska mångfalden beaktas beror därför på vilka målreferenser som finns att inarbeta i miljöbedömningsprocessen. I såväl MKB-direktivet och SMB-direktivet är biologisk mångfald särskilt angivet och den svenska lagstiftaren har noterat att uttrycket biologisk mångfald har en bred innebörd och omfattar bl.a. ekosystemtjänster och skyddade arter.[19] Relevanta målreferenser för den biologiska mångfalden ska på så sätt hämtas från en stor mängd källor såväl EU-direktiv, förordningar och mål, som målet om ingen nettoförlust av biologisk mångfald eller de svenska miljömålen t.ex. levande sjöar och vattendrag eller ett rikt växt- och djurliv. Genom att arbeta in dessa mål i den strategiska miljöbedömningsprocessen kan den spela en viktig roll för uppnåendet av målen.

[14] Commission, 'Proposal for a Council Directive on the Assessment of the Effects of Certain Plans and Programmes on the Environment' Com (96) 511 final, p. 1,13; Robert McCracken and Ned Westaway, 'The History and Context of the SEA Directive' in Gregory Jones QC and Eloise Scotford (eds), *The Strategic Environmental Assessment Directive – a Plan for Success?* (Hart Publishing 2017).

[15] Jo Treweek and others, 'Principles for the Use of Strategic Environmental Assessment as a Tool for Promoting the Conservation and Sustainable Use of Biodiversity' (2005) 7 Journal of Environmental Assessment Policy and Management 173.

[16] MKB-direktivet art. 3 och mål C-50/09, kommissionen mot Irland (2011), p. 36–37.

[17] SMB-direktivet art. 2(a). Commission, 'Implementation of Directive 2001/42 on the assessment of the effects of certain plans and programmes on the environment' (21 July 2001) s. 22–23 (SEA-vägledningen).

[18] Konventionen om biologisk mångfald art. 6; SMB-direktivet skäl 3.

[19] Prop. 2016/17:200 (n 7) s. 76–77.

Avseende interaktionen mellan MKB-direktivet och SMB-direktivet har EU-domstolen sagt att miljöbedömningar som utförts enligt MKB-direktivet inte påverkar tillämpningen av de särskilda kraven i SMB-direktivet.[20] I och med att MKB- och SMB-processerna skiljer sig åt i flera avseenden ska de två direktivens krav tillämpas kumulativt.[21] Det medför att även om gränsen mellan dessa förfaranden inte alltid är tydlig och kan vara överlappande vid exempelvis markanvändning och/eller fysisk planering ska det säkerställas att båda direktiven efterlevs.

EU har en begränsad kompetens på planområdet och det krävs konsensus för åtgärder som påverkar fysisk planering.[22] Vidare gäller subsidiaritetsprincipen som innebär att unionen endast ska agera inom de områden där den inte har exklusiv befogenhet när den planerade åtgärden inte i tillräcklig utsträckning kan uppnås av medlemsstaterna själva på central, regional eller lokal nivå.[23]

### 2.2 Direktivet och dess dynamiska gränser

Enligt direktivet är miljöbedömningar viktiga för att integrera miljööverväganden vid utarbetande och antagande av planer där det går att anta en betydande miljöpåverkan. Syftet med att genomföra en miljöbedömning är att säkerställa att eventuell betydande miljöpåverkan beaktas[24] och miljöaspekter integreras i utarbetandet och antagandet av planer för att på så sätt sörja för en hög nivå på skyddet av miljön och främja en hållbar utveckling.[25]

I och med att direktivet omfattar planer som kan antas medföra betydande miljöpåverkan är förståelsen av begreppen 'plan' och 'betydande miljöpåverkan' centrala för direktivets verkningar i medlemsstaterna. I direktivet tydliggörs att med 'planer' avses inte enbart det initiala utarbetandet utan också ändringar.[26] Förutsättningar för att omfattas av direktivet är annars att planen har utarbetats av och/eller antas av en myndighet på nationell, regional eller lokal nivå eller utarbetas av en myndighet och sedan antas av parlamentet eller regeringen genom ett lagstiftningsförfarande.[27] Det medför att omständigheten att en plan antas i form av lagstiftning inte utesluter den från direktivets tillämpningsområde.[28]

Det finns ingen direkt definition av 'plan'-begreppet i direktivet utan det framträder istället ur de kriterier och begrepp som aktualiserar miljöbedömningsinstrumentet. När EU-domstolen har diskuterat direktivets räckvidd har den använt begreppet rättsakt istället för plan/program vilket indikerar att 'plan'-begreppets definition fortfarande inte är helt klarlagd.[29] På grund av direktivets utformning utforskas 'plan'-begreppet sist i detta avsnitt.

*Begreppet betydande miljöpåverkan*

Det centrala begreppet för att bestämma om en plan ska genomgå en miljöbedömning är 'betydande miljöpåverkan'. Det finns ingen uttrycklig definition av begreppet men vägledning återfinns i bilaga II.[30] Bilagan specificerar ett antal indikatorer som kan ligga till grund för att anta att en betydande miljöpåverkan kan följa av pla-

[20] Mål C-295/10, Valčiukienė med flera, p. 58–63; se även SMB-direktivet art. 11(2).
[21] Ibid. p. 60–63.
[22] Fördraget om Europeiska unionens funktionssätt art. 192(2).
[23] Fördraget om Europeiska unionens funktionssätt art.5(2).
[24] SMB-direktivet skäl 4.
[25] SMB-direktivet art. 1.
[26] SEA-vägledningen (n 17) s. 5–6.
[27] SMB-direktivet art. 2(a).
[28] Mål C-105/09 och C-110/09, Terre wallonne ASBL, Inter-Environnement Wallonie ASBL mot Région wallonne, (2010) p. 41.
[29] Notera att i rättspraxis använder domstolen också begreppet 'rättsakt'. Se mål C-567/10, Inter-Environnement Bruxelles m.fl. (2011) p. 14.
[30] SMB-direktivet art. 2(b), 3(5).

nen. Indikatorer kan vara av betydelse för genomförandet av gemenskapens miljölagstiftning (t.ex. EU:s krav om skydd av dricksvatten[31]), särdragen hos påverkan och området som kan antas komma att påverkas, särskilt med hänsyn till sannolikhet, varaktighet och frekvens av påverkan och möjligheten att avhjälpa den. Indikatorer kan också vara av gränsöverskridande art, betydelsen av och sårbarheten hos det område som kan antas komma att beröras, överskridna miljökvalitetsnormer eller gränsvärden och intensiv markanvändning.[32] EU-domstolen har betonat att behöriga myndigheter ska beakta kriterier i bilaga II när de prövar om planen kan medföra betydande miljöpåverkan.[33]

*Indikatorer för betydande miljöpåverkan – kommande tillstånd*

Direktivet pekar ut ett antal situationer när en strategisk miljöbedömning ska genomföras, bland annat, beslut som avser fysisk planering, markanvändning och som sätter ramar för kommande tillstånd.[34] Om exempelvis ett myndighetsbeslut påverkar ett kommande tillstånd för projekt, såsom de som återfinns i MKB-direktivets bilaga I och II avseende exempelvis plats, typ, storlek, driftförhållanden, resursfördelning etc., finns det anledning att beakta beslutet som en plan eller program som omfattas av direktivet i och med att ramar sätts för kommande tillstånd.[35] Enligt MKB-direktivet avser ett tillstånd de ansvariga myndigheternas beslut som ger verksamhetsutövaren rätt att genomföra projektet.[36] Definitionen av tillstånd i MKB-direktivet är inte begränsande för SMB-direktivet utan här är även negativa begränsningar eller normer som införs inom, t.ex., ett planområde eller specifika kriterier, som verksamhetsutövare måste uppfylla, faktorer som kan medföra att en plan måste miljöbedömas. Planbegränsningarna är inte bara, exempelvis, bullernivåer, antalet verksamheter, storlek på verksamheten, driftsförhållanden eller fördelningen av resurser utan kan också avse miljörelaterade specifikationer av hur området ska se ut efter exploatering.[37] Oavsett om det handlar om negativ eller positiv påverkan på framtida tillstånd är det viktigt att notera att det inte behöver handla om absoluta begränsningar utan även påverkan som lämnar ett handlingsutrymme kan resultera i effekter på kommande tillstånd.

Trots att det finns vissa indikatorer på vad som menas med att begränsa/påverka kommande tillstånd finns det ingen uttömmande definition i direktivet. EU-domstolen har sagt att avsaknaden av en uttömmande definition i direktivet talar för en extensiv tolkning av kriteriet 'sätta ramar' för att på så sätt låta direktivet omfatta en stor mångfald av påverkan.[38] Den extensiva tolkningen leder till att, t.ex., myndighetsbeslut som väsentligt påverkar ett slutgiltigt beslut omfattas av direktivet.[39] Det kan exempelvis handla om beslut som skapar vissa förutsättningar som är till fördel för en verksamhetsutövare eller som skapar vissa antaganden kring vilka beslut som kommer att fattas. EU-domstolens förståelse av vad som menas med att 'sätta ramar' medför att

[31] Se exempelvis Ramvattendirektivet art. 7(2).
[32] SMB-direktivet bilaga II.
[33] Mål C-295/10 (n 20) p. 53–54.
[34] SMB-direktivet art. 3(2)(a), 3(4).
[35] C-105/09 och C-110/09 (n 28) p. 60.
[36] MKB-direktivet art. 1(2)(c).
[37] Se bilaga II punkt 1 första strecksatsen. Mål C-105/09 och C-110/09, Terre wallonne ASBL, Inter-Environnement Wallonie ASBL mot Région wallonne, förslag till avgörande Generaladvokat Kokott (2010), p. 64–65; se även mål C-290/15, D'Oultremont med flera, förslag till avgörande Generaladvokat Kokott (2016), p. 45, 57, 84.
[38] Liknande tolkningsmetod användes av domstolen och dess generaladvokat i, t.ex., mål C-461/13, Weser (2015).
[39] Elizabeth Fisher, 'Blazing Upstream? Strategic Environmental Assessment as "Hot" Law' in Gregory Jones QC and Eloise Scotford (eds), *The Strategic Environmental Assessment Directive – a Plan for Success?* (Hart Publishing 2017).

det är många olika typer av planrelaterade beslut som omfattas av direktivet.[40]

*Kriteriet – krävs av lag eller annan författning*

Ett annat kriterium för om t.ex. en plan ska genomgå en miljöbedömning är att beslutet ska krävas av lag eller annan författning.[41] Kriteriet är omdebatterat och har tolkats av EU-domstolen, där frågan var om planer som föreskrivs i lag men som inte är tvingande att anta omfattas av SMB-direktivet.[42] Generaladvokat Kokott menar att förarbetena och direktivet är tydliga och endast planer som antas på grund av en rättslig skyldighet omfattas av direktivet, däremot inte planer som föreskrivs i lag men som är frivilliga att anta.[43] EU-domstolen å andra sidan anser att generaladvokatens tolkning inte kunde godtas i och med att det skulle medföra att vissa planer, vars antagande regleras i lag, utesluts från direktivets tillämpningsområde enbart av det skälet att det inte finns någon skyldighet att anta rättsakten.[44] Domstolen ansåg att den tolkningen som generaladvokaten stod för riskerade att äventyra direktivets ändamålsenliga verkan med beaktande av dess syfte.[45] Domstolens tolkning medför att direktivet omfattar planer vars antagande regleras i lag och författning, där det exempelvis fastställs vilken myndighet som är behörig att anta planen och hur förfarandet för planens utarbetande ska ske, även om inget krav att upprätta planen finns.[46] EU-domstolens tolkning har ifrågasatts av, bland annat, Storbritanniens Högsta Domstol som menar att generaladvokatens analys är oklanderlig och att EU-domstolens slutsatser är felaktiga.[47]

Enligt förarbetena till direktivet är det tydligt att ett av grundsyftena med direktivet var att komplettera MKB-direktivet och säkerställa ett utökat/tidigare skydd för miljön genom att kräva miljöbedömningar av planer som riskerar att medföra betydande miljöpåverkan.[48] Unionens lagstiftningsprocess ledde fram till en kompromiss som begränsade direktivet till planer vars upprättande krävs av lag eller annan författning. EU-domstolens tolkning medförde att den frångick en strikt tolkning av direktivets förarbeten och istället fokuserade på hur SMB-direktivet skulle kunna uppfylla sitt syfte, en extensiv tolkning i konflikt med förarbetena.[49]

Däremot säkerställer domstolen genom sin tolkning av direktivets omfattning att EU-rättens syfte på miljöområdet upprätthålls. Med utgångspunkt i grunddragen för SMB-direktivet synes generaladvokatens tolkning av direktivet vara rimlig men i och med domstolens tolkning sker en förändring av direktivet och min tolkning av avgörandet är att domstolen sätter direktivets grundsyfte att komplettera MKB-direktivet före förarbetena till SMB-direktivet. En skillnad mellan direktiven är att MKB-direktivet fokuserar på effekterna som följer av projekt medan SMB-direktivet fokuserar på vem som utarbetar planen, hur planen utarbetas och dess rättsliga effekter. Som jag läser avgörandet var det just effekterna av en plan, som regleras i lag, som fick domstolen att till synes utvidga SMB-direktivets

[40] C-105/09 och C-110/09, förslag till avgörande av Generaladvokat Kokott (n 38), p. 64–65.
[41] SMB-direktivet art. 2(a).
[42] Mål C-567/10 (n 29).
[43] Mål C-567/10, Inter-Environnement Bruxelles m.fl., förslag till avgörande Generaladvokat Kokott, p. 14, 20.
[44] Ibid. p. 28.
[45] Ibid. p. 29–30.
[46] Ibid. p. 30.
[47] R (HS2 Action Alliance Ltd) v Secretary of State for Transport 2014 UKSC 3 (177). Noterbart är att Högsta Domstolen inte begärde ett förhandsavgörande. För en analys se: Fisher (n 40).
[48] Commission, 'Proposal for a Council Directive on the Assessment of the Effects of Certain Plans and Programmes on the Environment' (n 14); McCracken and Westaway (n 14).
[49] Notera att Espoo konventionen överlappar SEA- och EIA-direktiven.

omfattning och samtidigt skapa större överensstämmelse mellan SMB- och MKB-direktivet.[50] Syftet verkar vara att främja SMB-direktivets effektivitet utifrån dess egna kriterier och processer satt i jämförelse med MKB-direktivet.[51] En större koherens mellan direktiven medför också att det finns, möjligen, en större risk för överlappning mellan direktiven än innan avgörandet.[52] Noterbart är också att direktivet efter EU-domstolens avgörande överensstämmer mer med kommissionens tidiga förslag till SMB-direktiv och det verkar därför osannolikt att kommissionen skulle agera för att tydliggöra att den ser annorlunda på direktivets omfattning än domstolen.[53]

*Undantag och gränser*

Trots EU-domstolens extensiva tolkning finns det undantag som medlemsstaterna kan använda. Ett undantag är om planen avser ett fastställande av användningen av små områden på lokal nivå eller mindre ändringar av befintliga planer.[54] I kommissionens vägledning exemplifieras att undantaget för små planer inte ska tolkas extensivt utan det ska handla om planer för små områden där syftet är att, exempelvis, specificera mått och design på byggnader.[55] I dessa undantagsfall ska medlemsstaten genomföra en bedömning om planen kan antas medföra en betydande miljöpåverkan.[56] EU-domstolen har klargjort att det inte är tillåtet att på ett allmänt sätt och utan prövning i varje enskilt fall föreskriva att en miljöbedömning inte behöver företas för rättsakter som fastställer användningen av små områden på lokal nivå och som avser en enda ekonomisk verksamhet.[57] Medlemsstaterna kan ytterligare finna vägledning från kriterierna i bilaga II för att säkerställa att planer och program som kan antas medföra betydande miljöpåverkan omfattas av direktivet.[58] Relevanta kriterier i bilaga II kan vara om planen eller programmet påverkar andra planer eller program eller att det finns ackumulerande eller kumulativa effekter i anslutning till planområdet som inte behandlas. Finner medlemsstaten efter undersökning av planen att ingen betydande miljöpåverkan kommer att ske ska avvägandena till beslutet redovisas för allmänheten.[59] Hur kriterierna om betydande miljöpåverkan tolkas spelar stor roll för att definiera när en rättsakt övergår till att bli en 'plan' som omfattas av direktivet.[60]

En annan relevant aspekt för om en miljöbedömning ska genomföras eller inte är om rättsakten ingår i en normhierarki avseende, exempelvis, fysisk planering. Om det finns tidigare miljöbedömda planer som kan agera garant för att de intressen som direktivet syftar till att skydda finns det inget behov av att genomföra en ny miljöbedömning.[61] Grundläggande för att en tidigare miljöbedömning kan användas är att

[50] Notera även Domstolens avgörande mål C-43/10, Nomarchiaki, (2013) p. 96. Där domstolen menade att en plan under ramvattendirektivet inte var en plan eller program, alla fall inte inom ramen för omständigheterna i avgörandet. Det fanns vissa viktiga begränsningar såsom att frågan endast avsåg om den prövade rättsakten omfattades av kriterierna för plan eller program och inte om rättsakten satte ramar för kommande tillstånd.

[51] Fisher (n 40).

[52] Se även 'Report from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions on the application and effectiveness of the Directive on Strategic Environmental Assessment (Directive 2001/42/EC) Com (2009) 469' s. 6.

[53] C-567/10, Förslag till avgörande Generaladvokat Kokott (n 44) p. 18–19. Se även 'Report from the Commission to the Council and the European Parliament under Article 12(3) of Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment, COM(2017) 234 final'.

[54] SMB-direktivet art. 3(3).

[55] SEA-vägledningen (n 17) s. 12–13.

[56] SMB-direktivet art. 3(3)(5).

[57] C-295/10 (n 20) p. 54.

[58] SMB-direktivet art. 3(5).

[59] SMB-direktivet art. 3(7).

[60] C-41/11, Inter-Environnement Wallonie och Terre wallonne (2012), p. 40 och C-567/10 (n 29) p. 30.

[61] SMB-direktivet art. 4(3); se även C-567/10 (n 29) p. 42.

det kontrolleras att bedömningen kan anses ge uttryck för ett samordnat förfarande mellan planerna och direktivets krav på så sätt redan har uppfyllts.[62] Samtidigt ska det ihågkommas att i detta och andra gränsfall har EU-domstolen påpekat att direktivet ska tolkas extensivt, särskilt de bestämmelser som innehåller definitioner av vilka rättsakter som direktivet omfattar.[63] Det medför också att undantag eller begränsningar av dessa bestämmelser ska tolkas restriktivt.[64]

*'Plan'-begreppet*

EU-domstolens restriktiva/extensiva tolkning av direktivet går att återfinna i flertalet avgöranden, t.ex. säger domstolen att 'markplaner' vars antagande regleras i lag omfattas av direktivet trots att det inte finns någon skyldighet att anta dessa 'planer'.[65] Vidare menar domstolen att en rättsakt kan antas medföra betydande miljöpåverkan om rättsakten innehåller fastställda kriterier och metoder för markplanering, vars genomförande regleras av de bestämmelser och förfaranden som föreskrivs i rättsakten.[66] Dessutom kan ett beslut att delvis eller helt upphäva en plan antas medföra en betydande miljöpåverkan om det resulterar i att de rättsliga förutsättningarna ändras, vilket i sin tur riskerar att förvanska den miljöbedömning som tidigare genomförts.[67] Medlemsstaterna måste alltså vid ett delvis eller helt upphävande av en plan kontrollera om upphävandet ändrar tillståndet hos miljön som undersöktes vid antagandet av den påverkade rättsakten.[68] Det medför också att planer som inte i sig själva kräver en miljöbedömning, p.g.a. exempelvis sin storlek, men som geografiskt faller inom en tidigare miljöbedömd plan måste prövas utifrån den påverkan som planen har på den tidigare genomförda miljöbedömningen. EU-domstolens avgöranden tydliggör att direktivets 'plan'-begrepp är dynamiskt och med ett sådant begrepp kan direktivets syfte, att sörja för ett gott miljöskydd och bidra till att miljöfrågor beaktas vid utarbetandet och antagandet av vissa planer, uppnås. 'Plan'-begreppets dynamik grundar sig i att det inte har någon uttömmande definition i direktivet.

Domstolen har också tydliggjort att 'plan'-begreppet inte ska förstås i singularis utan om en plan i hög grad inverkar på en annan plan, kan det hända att planens miljöpåverkan blir mer vittomfattande – eller djupgående – än vad som annars skulle bli resultatet.[69] Information om en plans förhållande till andra planer etablerar ett större sammanhang för planen som måste beaktas vid miljöbedömningsundersökningen. Det kan exempelvis handla om information om var i beslutsprocessen planen befinner sig eller hur planen tillsammans med andra planer bidrar till förändringar av miljöförhållandena i ett geografiskt område större än den enskilda planen. Relevanta planer kan alltså avse planer på en annan nivå i det system som planen ingår i eller planer som gäller andra sektorer men som påverkar samma eller angränsande geografiska ytor. Att beskriva alla befintliga miljöproblem som är relevanta för planen ska alltså förstås kontextuellt baserat på ett mycket större område, där flertalet planer tillsammans kan sägas utgöra en 'plan' enligt direktivet i och med att deras sammantagna miljöeffekter ger upphov till en betydande miljöpåverkan. En sådan operationalisering av begreppen 'plan' och 'betydande miljöpåverkan' medför att det blir svårt att inte behöva genomföra en miljöbedömning för små planer i och med

[62] Se art. 11(2) men även mål C-473/14, Dimos kopias Attikis mot Ypourhos Perivallontos, Energeias Kai Klimatikis Allagis (2014) p. 58.
[63] Se C-567/10 (n 29) p. 37.
[64] C-473/14 (n 63) p. 50.
[65] C-567/10 (n 29) p. 28.
[66] Ibid p. 30.
[67] Ibid p. 38–39.
[68] Ibid p. 40.
[69] SEA-vägledningen (n 17) s. 15.

att dessa ofta är en del av en större helhet. Exempelvis behöver det inte nödvändigtvis vara så att alla enskilda planer måste genomgå en miljöbedömning utan det är mer fördelaktigt att en övergripande plan, som binder samman dessa mindre planer, genomgår bedömningen för att göra en process och inte flera.[70]

Med avseende på EU-domstolens avgöranden är det viktigt att definitionen av begreppet 'plan' är dynamisk även inom ramen för medlemsstaternas rättssystem. Detta borde innebära att i en svensk kontext bör inte 'plan'-begreppet enbart motsvara vad som avses med plan enligt PBL eller MB utan uppfattas som ett överordnat begrepp som omfattar mycket mer än vad begreppet i ett nationellt planläggningssystem vid första anblicken ger sken av.

## 3. Den svenska strategiska miljöbedömningen

Analysen av svensk rätt är fokuserad på implementeringen av SMB-direktivets begrepp 'plan' och 'betydande miljöpåverkan'. I svensk rätt återfinns direktivet i huvudsak i 6 kap. miljöbalken, miljöbedömningsförordningen (MBF) och i plan- och bygglagen.

### 3.1 Miljöbedömningar och planer

Huvudsyftet med PBL är att ange de rättsliga utgångspunkterna för fysisk planering av mark- och vattenområden samt planeringen av bebyggelse. I 1:1 PBL specificeras att lagen syftar till att främja en samhällsutveckling med jämlika och goda sociala levnadsförhållanden samt en god och långsiktigt hållbar livsmiljö för människorna i dagens samhälle och för kommande generationer.[71] PBL definierar planläggning som arbetet att ta fram regionplan, översiktsplan, detaljplan eller områdesbestämmelser.[72] I 2 kap. PBL finns det regler om vilka allmänna intressen som ska beaktas vid planläggning och hänsyn ska tas till bland annat natur- och kulturvärden och miljö- och klimataspekter.[73]

Huvudregeln är att PBL ska tillämpas parallellt med MB. Däremot tillämpas inte de allmänna hänsynsreglerna i 2 kap. MB vid planläggning.[74] Regler i MB som annars normalt ska beaktas vid planläggning är bestämmelserna om hushållning i 3–4 kap., miljökvalitetsnormer i 5 kap. och reglerna om miljöbedömningar i 6 kap.[75]

De miljöeffekter som en strategisk miljöbedömning ska fånga upp är påverkan på biologisk mångfald, mark, vatten, luft, klimat, landskap, bebyggelse och den fysiska miljön i övrigt.[76] I förarbetena tydliggörs att begreppet 'biologisk mångfald' har stor räckvidd och inkluderar ekosystem och ekosystemtjänster.[77] Miljöeffekter kan avse en mängd olika typer av påverkan såsom direkta, indirekta, positiva, negativa, tillfälliga, bestående, kumulativa, etc. som kan uppstå på kort, medellång eller lång sikt.[78] I förarbetena tydliggörs att en strategisk miljöbedömning ska innehålla en identifiering, beskrivning och bedömning av sådana miljöeffekter som genomförandet av planen kan antas medföra antingen i sig eller till följd av yttre händelser.[79] Det medför att miljöbedömningen ska väga in händelser såsom klimatförändringar som kan resultera i miljöeffekter som kan behöva förebyggas, hindras eller avhjälpas.[80]

6:3 och 6:5 MB specificerar att en kommun som upprättar eller ändrar en plan som krävs i

[70] Se även SMB-direktivet art. 11.
[71] Se även 2:3 PBL.
[72] 1:4 PBL.
[73] 2:3 PBL.
[74] Se bland annat definitionen i 2:1 MB.
[75] Se även 2:10 PBL.
[76] 6:2 MB.
[77] Prop. 2016/17:200 (n 7) s. 77.
[78] 6:2 MB.
[79] Prop. 2016/17:200 (n 7) s. 97, 128–129.
[80] Ibid.

lag eller annan författning ska göra en strategisk miljöbedömning, om genomförandet av planen, programmet eller ändringen kan antas medföra en betydande miljöpåverkan. För vissa planer är frågan om betydande miljöpåverkan redan avgjord och i 2–4 MBF återfinns en specifikation över vilka planer som kan antas medföra en betydande miljöpåverkan eller bör undersökas avseende sin påverkan.[81] Vid en miljöbedömning ska samråd genomföras, både avseende undersökningen och avgränsningen.[82] Enligt MB ska samrådet inkludera myndigheter med ett särskilt miljöansvar men i PBL avgränsas kravet vid översiktsplaner och detaljplaner till att enbart gälla länsstyrelsen.[83]

I MB tydliggörs processen kring undersökningen av om en plan eller ändringen kan antas medföra en betydande miljöpåverkan.[84] I undersökningskravet ligger att myndigheten eller kommunen identifierar omständigheter som talar för eller emot en betydande miljöpåverkan och samråder, i frågan om betydande miljöpåverkan, med kommuner och myndigheter som kan antas bli berörda[85] av planen.[86] Omständigheter som talar för att en plan kan medföra en betydande miljöpåverkan är i vilken utsträckning planen eller ändringen anger förutsättningar för verksamheter eller åtgärder när det gäller lokalisering, typ av verksamhet, storlek eller driftsförhållanden eller genom att fördela resurser. Andra relevanta omständigheter är om planen påverkar miljöeffekter som genomförandet av andra planer eller program medför, har betydelse för att främja en hållbar utveckling eller för integreringen av miljöaspekter i övrigt, eller har betydelse för möjligheterna att följa miljölagstiftningen.[87] Andra indikationer kan vara miljöproblem som planen relaterar till, det påverkade områdets utmärkande egenskaper, i vilken utsträckning det går att avhjälpa sannolika miljöeffekter, miljöeffekternas omfattning och det påverkade områdets betydelse och sårbarhet på grund av intensiv markanvändning, överskridna miljökvalitetsnormer eller andra utmärkande miljöegenskaper.[88] Trots alla de omständigheter som kan medföra att en plan ska miljöbedömas, är det fortfarande endast planer som krävs i lag eller annan författning som omfattas enligt svensk lag.[89]

I den senaste reformen av 6 kap. MB tydliggjordes att om en kommun väljer att inte genomföra en miljöbedömning av, exempelvis, en detaljplan ska detta motiveras och skälen för beslutet ska redovisas.[90] Däremot får ett sådant beslut inte överklagas särskilt.[91] Det innebär att frågan om en miljöbedömning borde genomföras får överklagas i ett senare skede, såsom när en detaljplan antagits.

*Översiktsplan*

I MBF är utgångspunkten att översiktsplanen medför en betydande miljöpåverkan om den anger förutsättningar för bland annat tätortsbebyggelse, industriområden, byggande av vägar och olika anläggningar för turism och friluftsliv.[92] Det innebär att en översiktsplan i princip alltid kan antas medföra en betydande miljöpåverkan och att en strategisk miljöbedömning ska genomföras.

Planlagstiftning ger översiktsplanen en stor strategisk betydelse och den är ett viktigt miljö-

[81] 6:4 MB.
[82] 6:6 och 6:9–10 MB.
[83] 6:6 och 6:10 MB; 3:9, 5:11 PBL.
[84] 6:5 MB.
[85] En myndighet kan exempelvis bli berörd i och med ett av de svenska miljömålen påverkas och det åligger ett ansvar på myndigheten att genomföra och uppnå detta miljömål.
[86] 6:6 MB.
[87] 5 MBF.
[88] 5 MBF.
[89] 6:5 MB.
[90] 6:7 MB, 4:33 b PBL.
[91] 6:8 MB.
[92] 2 MBF.

politiskt styrmedel för kommunen. Planen ska ange inriktningen för den långsiktiga utvecklingen av den fysiska miljön, samtidigt som hänsyn ska tas till exempelvis riksintressen och miljökvalitetsnormer och nationella och regionala mål, såsom de svenska miljömålen.[93] I och med att översiktsplanen ofta anger förutsättningar för verksamheter och åtgärder där kumulativa effekter kan uppstå, exempelvis bebyggelse, industrier eller industriområden och vägar, är miljöbedömningen ett viktigt verktyg för att identifiera och hantera planens miljöeffekter.

Genom översiktsplanen kan miljöeffekternas kumulativa effekter analyseras på storskalig nivå, exempelvis för att säkerställa goda livsvillkor för djur- och växtlivet. Samtidigt är plantypen i huvudsak en kommunal angelägenhet och det är kommunen som beslutar om översiktsplanens innehåll. Det kommunala beslutet kan inte överprövas av länsstyrelsen även om myndigheten anser att det finns risk att planen skulle motverka uppnåendet av exempelvis miljökvalitetsnormer. Kommunernas monopol avseende översiktsplaner kan vid problematiska planer motverkas av att dessa inte har rättsverkan. Det innebär också att enskilda inte har rätt att överklaga en översiktsplan annat än som kommunalbesvär.[94] Problem som kan ge enskilda rätt att klaga är om formella regler om planförfarandet inte har följts men däremot ger inte en olämplig plan enskilda rätt att klaga.[95]

PBL kräver att det finns en aktuell översiktsplan för kommunen som helhet, men skulle en kommun inte uppdatera planen på grund av bristande överensstämmelse med exempelvis gällande miljömål finns det inga möjligheter för länsstyrelsen att agera emot kommunen.[96] Det länsstyrelsen kan och ska göra är att minst en gång under mandatperioden redovisa för kommunen sina synpunkter i fråga om statliga och mellankommunala intressen som kan ha betydelse för översiktsplanens aktualitet.[97] Kommunen ska alltid samråda med länsstyrelsen och dessutom ska myndigheten under utställningstiden av planen avge ett granskningsyttrande över planförslaget.[98] Av yttrandet ska det framgå om planförslaget exempelvis inte är i linje med utpekandet av riksintressen (3–4 kap. MB), riskerar att resultera i att miljökvalitetsnormer inte följs, att utpekandet av landsbygdsutvecklingsområden inom strandskyddszonen inte stämmer överens med 7:18 e MB eller att den är olämplig med avseende på risken för översvämningar.[99] Lagstiftaren anser att den bristande möjlighet som finns att överklaga en översiktsplan kompenseras av att efterföljande beslut är överklagbara, såsom detaljplaner.

Kommunerna kan genomföra en ändring av en översiktsplan för en del av kommunen och då används ofta begreppet fördjupad översiktsplan.[100] Samma regler om miljöbedömning gäller för den fördjupade översiktsplanen som för den ordinarie planen.

[93] 3:2–5 PBL, prop. 2009/10:170, En enklare plan- och bygglag, s. 419.

[94] 13:1 PBL. Vid kommunalbesvär prövas om kommunen följt relevanta lagar såsom PBL eller MB vid upprättandet och beslutandet om exempelvis en översiktsplan. Alla kommunmedlemmar får lämna in ett överklagande. Prövningen avser däremot inte översiktsplanens lämplighet som planinstrument för kommunen, något följer av att planen inte bindande. Ett överklagande av exempelvis en detaljplan betecknas som förvaltningsbesvär och avser då både planens lämplighet och om den tillkommit i linje med relevanta regleringar. Det är endast enskilda som berörs av en detaljplan som får klaga.

[95] 13:1 PBL, 13:1–2, 8 KL.

[96] 3:27 PBL.

[97] 3:28 PBL.

[98] 3:8, 3:16 PBL.

[99] 3:16 PBL.

[100] 3:23 PBL.

*Detaljplan*

Till skillnad från översiktsplanens storskaliga syfte får en detaljplan inte omfatta ett större område än vad som behövs med hänsyn till bland annat detaljplanens syfte och genomförandetid.[101] Planens syfte avgör därför vilka planbestämmelser som kan användas i planen. Genom detaljplanen kan kommunen reglera mark- och vattenområdens användning, bebyggelse och byggnadsverk.[102] Det finns vissa situationer där kommunen ska initiera en detaljplanereglering och det kan handla om en ny/ändrad sammanhållen bebyggelse.[103]

Möjligheterna till detaljreglering av den fysiska miljön är relativt stora och kommunen kan bestämma om vegetation och markytans utformning och höjdläge.[104] Uppstår det störningar är kommunen begränsad till att bestämma skyddsåtgärder för att exempelvis motverka markföroreningar och översvämningar eller, om det finns särskilda skäl, föreskriva om högsta tillåtna värden för störningar genom luftförorening eller andra olägenheter.[105] Kommunens regleringsmöjligheter är här begränsade till påverkan som uppstår på grund av 9 kap. MB verksamheter/åtgärder och det handlar om hälsoskyddande åtgärder vid svåra förhållanden inom tätbebyggda områden och endast indirekt miljöförbättrande åtgärder avseende ekologiska värden.[106]

Detaljplaner ska genomgå en miljöbedömning om genomförandet av planen kan antas medföra en betydande miljöpåverkan. Till skillnad från översiktsplanen, där betydande miljöpåverkan som regel kan antas, ska detaljplanen undersökas för att se om en miljöbedömning krävs. Om detaljplanen har stöd i en aktuell och tydlig översiktsplan bör undersökningen av detaljplanen kunna stödjas på materialet som legat till grund för översiktsplanens miljöbedömning.[107] Om detaljplanen ska genomgå en miljöbedömning bör även avgränsningssamrådet kunna baseras på materialet som legat till grund för översiktsplanen.

En viktig del i utarbetandet av en detaljplan är att upprätta en planbeskrivning. Planbeskrivningens uppgift är att visa hur detaljplanen ska förstås och genomföras.[108] I planbeskrivningen ska kommunen redovisa planeringsförutsättningarna, planens syfte och hur planen är avsedd att genomföras[109] och de konsekvenser som ett genomförande av detaljplanen medför för bland annat sakägare och miljön ska framgå.[110] Om detaljplanen avviker från översiktsplanen ska det framgå i planbeskrivningen på vilket sätt den gör det och vilka skälen för avvikelsen är. Om planen ska genomföras genom exploateringseller markanvisningsavtal ska deras innehåll och konsekvenser redovisas.[111] Om en strategisk miljöbedömning inte genomförs ska skälen för bedömningen i den frågan anges i planbeskrivningen.[112]

Ett närliggande PBL-begrepp som kan kopplas till detaljplanen är 'planprogram'. Planprogrammet och planbeskrivningen avser olika saker. Planprogrammet är frivilligt men kan fungera som en planbeskrivning i vissa komplicerade sammanhang och omfatta flera detaljplaner.[113] I och med att det i svensk lag sägs att planen eller programmet ska krävas av lag finns det inga svenska regler om miljöbedömning av den här typen av program som samordnar flera planer.

101 4:32 PBL.
102 4:1 PBL.
103 4:2 PBL.
104 4:5 PBL.
105 4:12 PBL.
106 3:10, 3:12, 3:14 PBL.
107 MÖD mål nr P 2134-15 (2016-01-20).
108 4:31 PBL.
109 4:33 PBL.
110 Prop. 2009/10:170 (n 94) s. 435.
111 Prop. 2013/14:126, 'En enklare planprocess', s. 159.
112 4:33 b PBL.
113 5:10 PBL, se även prop. 2009/10:170 (n 94) s. 235–236.

Länsstyrelsen är tillsynsmyndighet avseende kommunala detaljplaner. Myndigheten kan överpröva detaljplaner utifrån ett antal förutsättningar såsom: om ett riksintresse enligt 3 eller 4 kap. MB inte tillgodoses, om regleringen av sådana frågor som användningen av mark- och vattenområden som angår flera kommuner inte samordnas på ett lämpligt sätt, en miljökvalitetsnorm enligt 5 kap. MB inte följs eller om det finns risker för olyckor, översvämning eller erosion. Det finns en viss skevhet mellan kraven om tillämpning av hushållningsbestämmelserna vid planläggning samt möjligheterna till överprövning och det är att kommunala planbeslutet bara kan överprövas om det strider mot riksintressen enligt 3 och 4 kap. MB och inte bestämmelserna i övrigt. Det ska också påpekas att regeringen har möjlighet att agera under särskilda förutsättningar och förelägga en kommun att anta, ändra eller upphäva en detaljplan (planföreläggande).[114] Om kommunen inte följer föreläggandet, får regeringen överta kommunens planeringsroll och besluta att länsstyrelsen på kommunens bekostnad ska genomföra planläggningen som föreläggs.

*Områdesbestämmelser*

Kommunen kan använda sig av områdesbestämmelser för att reglera användningen av mark- och vattenområden som inte omfattas av detaljplan och om det behövs för att säkerställa syftet med översiktsplanen.[115] Bestämmelserna kan också användas för att tillgodose ett riksintresse enligt 3 eller 4 kap. MB. Områdesbestämmelser har rättsverkan, i likhet med detaljplaner. De två planerna är tänkt att komplettera varandra och områdesbestämmelser saknar, till skillnad från detaljplanen, ett obligatoriskt minsta innehåll och har inga regler om hur genomförandet ska ske. Samtidigt får områdesbestämmelser inte reglera exempelvis utformningen av byggnader utan här är tanken att en detaljplan ska användas. Bestämmelsernas rättsverkan är begränsade till att det inte är tillåtet att bygga i strid med dem. I likhet med detaljplanen ska frågan om miljöbedömning prövas genom en undersökning. Precis som för detaljplaner är det länsstyrelsen som är tillsynsmyndighet och möjligheterna för länsstyrelsen att agera emot upprättandet av områdesbestämmelser är desamma som för detaljplaner.

## 4. Kompatibilitetsproblem?

Analysen av SMB-direktivet visar att begreppen 'plan' och 'betydande miljöpåverkan' i interaktion är ett dynamiskt begreppspar med potentiellt stor påverkan på medlemsstaternas lagstiftning. EU-domstolens extensiva hållning har i detta sammanhang medfört att det är många olika typer av 'planer' som omfattas av direktivet. När direktivet implementerades i svensk rätt fördes miljöbedömningsinstrumentet in i ett befintligt planläggningssystem i MB och PBL utan att det systemet anpassades i större utsträckning till direktivet. Vid den senaste revideringen av 6 kap. MB diskuterades 'plan'-begreppets abstraktion och dynamik men utan att någon förändring genomfördes i detta hänseende i vare sig MB eller PBL. Samtidigt är det klart att den senaste revideringen av miljöbedömningslagstiftningen inte följer EU-domstolens praxis kring direktivets omfattning. Detta blir tydligt i och med att den svenska lagstiftaren fortsätter att hålla fast vid ordet 'krävs' i lag eller annan författning som ett grundkrav för att en plan ska träffas av miljöbedömningsreglerna. Den svenska implementeringen av direktivet i detta hänseende strider emot domstolens avgörande kring 'markplaner' som inte krävdes enligt lag utan vars antagande reglerades i lag utan att det fanns någon skyldig-

[114] 11:15–16 PBL. Notera också att 11:13–14 PBL numera är upphävda.
[115] 4:41 PBL.

het att anta rättsakten.[116] Avgörandet är en del av en större helhet där domstolen extensivt har tolkat direktivet för att säkerställa att dess syfte kan uppnås.

Tveksamheterna i den svenska implementeringen medför att det går att ifrågasätta om direktivets syfte kan uppnås utifrån hur miljöbedömningsreglerna i MB och PBL har utformats.

*Planhierarkin och miljöbedömningar*

Svensk planlagstiftning är uppbyggd i ett hierarkiskt system där översiktsplanen spelar en viktig roll avseende analysen av miljöeffekter och utgör en viktig kontext för småskaliga planer såsom detaljplaner och områdesbestämmelser. Översiktsplaner ska som regel genomgå en miljöbedömning och lägger på så sätt grunden för efterföljande planer som beroende av miljöbedömningens kvalité och djup kan basera sig på översiktsplanens miljöbedömning. I och med översiktsplanens storskalighet kan dess miljöbedömning underlätta genomförandet av en mer detaljerad miljöbedömning av lokala miljöeffekter som följer av en detaljplan genom att exempelvis kumulativa miljöeffekter bortom exploateringsområdet redan kan ha undersökts. Samtidigt finns det statistik på att ca 10 % av detaljplanerna genomgår en miljöbedömning och översiktsplanens storskalighet sällan gör den till ett fullgott underlag för att bedöma miljöeffekterna av en eller flera detaljplaner.[117]

Att få detaljplaner genomgår en miljöbedömning följer av den rättsliga konstruktionen av detaljplanen som medför att den med lite god vilja kan omfattas av direktivets undantag avseende små planer. Kommissionen menar att undantaget som finns i direktivet för små planer inte ska tillämpas på ett systematiskt sätt såsom det verkar ske för detaljplaner.[118] Om kommunerna som regel undantar detaljplaner från miljöbedömningen finns det ingen plan som analyserar de mer lokala miljöeffekterna från en eller flera detaljplaner utan det är endast översiktsplanens övergripande miljöbedömning som finns. Kommunen har möjligheten att genom en ändring av översiktsplanen genomföra en fördjupad översiktsplan för ett exploateringsområde. En fördjupad översiktsplan följer av samma regelverk som en översiktsplan och är inte bindande samt har samma begränsningar avseende länsstyrelsen möjligheter att agera och påverka dess innehåll. Det finns inte heller någon säkerhet i att det räcker med en fördjupad översiktsplan för att tillgodose kraven om undersökning utan det kan även krävas en miljöbedömning av detaljplaner som upprättas inom den fördjupade översiktsplanens geografiska område.[119] Översiktsplanens rättsliga konstruktion och det faktum att så få detaljplaner genomgår en miljöbedömning indikerar att det finns miljöeffekter som aldrig genomgår en adekvat genomlysning. Följdeffekter av att detaljplanerna inte genomgår en miljöbedömning är att exempelvis kravet om övervakning av förutsedd och icke förutsedd betydande miljöpåverkan inte aktiveras och ytterligare miljöeffekter riskerar att missas.[120]

När EU-domstolen tolkat direktivet har syftets uppfyllande spelat en stor roll. Direktivets syfte är att integrera miljööverväganden vid utarbetande och antagande av planer (och program). Om undantaget för små planer systematiskt används för detaljplaner finns det en rättslig problematik. Här är själva konstruktionen av detaljplanen problematisk i och med att den har till syfte att på ett avgränsat sätt planera exempelvis bostadsbyggande. Konstruktionen

[116] C-567/10 (n 29) s. 28.
[117] Faith-Ell, Halling and Baheram (n 10) s. 23.
[118] SEA-vägledningen (n 17) s. 12–13.
[119] MÖD mål nr P 11599–14 (2015-07-20).
[120] SMB-direktivet art. 10 och 6:19 MB.

gör det möjligt att dela upp exploateringen av ett område i ett antal detaljplaner, som inte behöver vara i linje med översiktsplanen, där kommunen på grund av planernas storlek kan hävda att de inte ska miljöbedömas. Kommunen kan sedan upprätta ett planprogram för samtliga detaljplaner och samordnat behandla dem där utan att det programmet genomgår en miljöbedömning – allt i enlighet med svensk rätt men i konflikt med EU-rätten. I vissa kommuner används programmet när detaljplaner riskerar att inte överensstämma, eller är i konflikt, med översiktsplanen, vilket tydliggör vikten av att genomföra en samordnad miljöbedömning av detaljplaner som helhet.[121] Ett sådant nyttjande av planprogrammet är i konflikt med direktivet och EU-domstolen har varit tydlig med att även ändringar av planer ska miljöbedömas, särskilt om ändringen påverkar en plan som genomgått en miljöbedömning. I och med att programmet är frivilligt finns det heller inget krav enligt svensk lag att genomföra en miljöbedömning. Att det i PBL inte finns något sätt för enskilda eller länsstyrelsen att agera för att ändra plandifferentieringen eller kräva en miljöbedömning om detaljplanen inte är i linje med översiktsplanen och miljöbedömningen indikerar att det finns ett systemfel i PBL avseende integreringen av miljööverväganden vid planläggning.

Även om det finns begränsningar och systematiska problem i svensk rätt har EU-domstolen varit tydlig i frågan om frivilliga planer. Enligt EU-rätten är det utan tvekan så att ett planprogram ska genomgå en miljöbedömning om det kan antas medföra en betydande miljöpåverkan. Det finns samtidigt inga möjligheter att överklaga vare sig planprogrammet eller översiktsplanen utan det är endast inom ramen för detaljplaner som ett överklagande kan resas. Det handlar alltså om ett systematiskt fel där miljöeffekterna av planläggningen riskerar att aldrig prövas. Situationen kan jämföras med hur MKB-direktivet tidigare kunde kringgås i svensk rätt men där Miljööverdomstolen genom en EU-konform tolkning nekade tillstånd till vattenverksamhet p.g.a. att miljöeffekterna som helhet av projektet inte prövats.[122] På senare tid har Högsta Förvaltningsdomstolen tydliggjort att MKB-förfarandet vid gruvprojektering måste omfatta miljöeffekterna som helhet och analysen indikerar att liknande problem återfinns avseende planer.[123] Även om svensk rätt i detta hänseende ska åsidosättas enligt principen om EU-rättens företräde är det en systematisk begränsning som behöver förändras för att direktivets syfte ska kunna uppfyllas i svensk rätt.[124]

Sammantaget ger de kompatibilitetsproblem som analysen identifierat upphov till en fråga om Unionen trots sin begränsade kompetens på planområdet genom direktivets syfte också påverkar vad för planlagstiftning som medlemsstaterna måste ha. För att säkerställa att direktivets syfte inte undergrävs verkar det finnas behov av en planlagstiftning i medlemsstaterna som resulterar i att sammanhängande exploateringar eller andra åtgärder/verksamheter som sammantaget medför en betydande miljöpåverkan också ska genomgå en strategisk miljöbedömning. I vissa sammanhang kommer verksamheter/åtgärder att genomgå en projektmiljöbedömning men för exploateringar såsom

[121] Se exempelvis hur Malmö och Uppsala kommun beskriver planprogrammet: https://malmo.se/Service/Bygga-och-bo/Detaljplaner/Planprogram.html; https://bygg.uppsala.se/planerade-omraden/eriksberg/planprogram/vad-ett-planprogram-ar/ (besökt 2020-02-03).

[122] MÖD 2007:50 (Högsta domstolen prövade vilket stöd som miljööverdomstolen borde ha avvisat miljökonsekvensbeskrivningen, se NJA 2008 s. 748.)

[123] HFD mål nr 2047-14.

[124] Den här bristande förståelsen av SMB-direktivets krav återfinns också i SOU 2018:46, 'En utvecklad översiktsplanering', s. 77.

byggandet av bostäder eller liknande exploateringar som endast kräver bygglov är situationen en annan. Frågan är om det i direktivet finns ett 'plan'-begrepp som medlemsstaterna måste ta hänsyn till när de utformar sin planlagstiftning för att på sätt säkerställa att direktivets syfte kan uppnås.

*'Plan'-begreppet*

Med tanke på att en översiktsplan ska omfatta kommunens hela yta finns det anledning att i miljöbedömningen inte gå in för djupt i eventuella miljökonsekvenser som kan uppstå vid ny bebyggelse som omfattas av reglerna om detaljplaner. Den relativt stora geografiska skillnaden mellan översiktsplanen och detaljplaner/områdesbestämmelser ger sken av att det finns ett glapp mellan dessa planer. I vissa sammanhang upprättar kommunerna frivilligt en fördjupad översiktsplan eller ett planprogram för att täppa igen glappet mellan planerna. Men det finns ingen garanti att så sker utan det förekommer endast om kommunen tar initiativ till det.

Med utgångspunkt i SMB-direktivets syfte är frågan om inte direktivet i sitt undersökningskrav egentligen är fokuserat på miljöeffekterna av planläggning generellt oavsett om det handlar om en eller flera planer. I den svenska implementeringen har planbegreppet kopplats ihop med planläggningsbegreppet i PBL och de planer som där återfinns. Risken med att koppla direktivets 'plan'-begrepp i alltför stor utsträckning till enskilda planer är att exempelvis kumulativa effekter av flertalet sammanhängande planer inte undersöks eller att ingen miljöbedömning genomförs alls.

Vad som är en 'plan' enligt direktivet diskuteras kort i proposition 2016/17:200 och lagstiftaren hänvisar till kommissionens vägledning och noterar att plan/programbegreppet har en vid mening och kan avse allt från officiella deklarationer till avsiktsförklaringar som lägger fast en planerad inriktning av framtida åtgärder.[125] Baserat på kommissionens tolkning av vad en plan kan avse har den svenska lagstiftaren avstått från att definiera begreppet 'plan' eftersom ett begrepp med en sådan vid mening är svårt att definiera. Det som saknas är en analys av vad ett sådant extensivt begrepp, som inte går att definiera, har för påverkan på svensk planlagstiftning.[126] Interaktionen mellan begreppen 'plan' och 'betydande miljöpåverkan' har till följd att prövningen av om en plan medför betydande miljöpåverkan omfattar många olika rättsliga dokument och inte bara vad som traditionellt har ansetts vara exempelvis en plan i den svenska kontexten.[127]

Det finns krav i MBF om att undersökningen av betydande miljöpåverkan ska ta i beaktning planens påverkan på andra planer eller program och de miljöeffekter som sammantaget eller kumulativt uppstår.[128] Här sätts den enskilda planen i relation till andra planer men det är oklart hur bedömningen av miljöpåverkan ska genomföras och inom vilken plan som miljöbedömningen av de samlade miljöeffekterna ska ske. Det finns därför skäl att lösgöra prövningen av betydande miljöpåverkan från enskilda planer och istället fokusera prövningen på om planläggningen av ett område resulterar i betydande miljöpåverkan. Om planläggningen består av en eller flera planer är i så fall inte relevant. Direktivet och domstolens expansiva tolkning upplöser den rättsliga förförståelsen om vad som i ett svenskt rättssammanhang ansetts utgöra en plan och därmed också vad som ska miljöbedömas. En sådan utgångspunkt medför att ett område som exploateras baserat på exempelvis fem geografiskt eller miljömässigt sammanlänkande detaljplaner ska undersökas gemensamt som en

[125] Prop. 2016/17:200 (n 7) s. 85–86.
[126] Ibid.
[127] Se 2–4 MBF, 6:6 MB.
[128] 5 MBF.

'plan'. Direktivets 'plan'- (och program)begrepp förstås bäst som en abstrakt konstruktion som endast i liten utsträckning går att jämföra med hur ordet plan används i svensk rätt.

Ett första steg för att hantera delar av de brister som nämns ovan är att införa ett krav på att detaljplaner som inte är kompatibla med översiktsplanen ska genomgå en miljöbedömning trots att detaljplanen möjligen kan omfattas av undantaget om små planer. Argumentet för en sådan regel är att detaljplanen frångår en miljöbedömd plan och på så sätt kan antas medföra en betydande miljöpåverkan. Den hierarkiska positionen av översiktsplanen på grund av dess mer övergripande anslag och dess möjligheter att sätta en lokal miljöpåverkan i ett större sammanhang gör att avbrott från planen kan medföra en betydande miljöpåverkan. Trots att översiktsplanen inte har rättskraft måste den miljöbedömningen som genomförs anses så viktig inom det planhierarkiska systemet i svensk rätt att avsteg från den indikerar en betydande miljöpåverkan.

## 5. Slutsatser

Strategiska miljöbedömningar kan vara ett utmärkt verktyg för att exempelvis planera kompensationsåtgärder för att hantera miljöeffekterna av planläggning och bland annat undvika en nettoförlust av biologisk mångfald. Jämförelsen mellan MB/PBL och SMB-direktivet visar att regelverken i grunden är överensstämmande i och med att båda regelverken syftar till att integrera miljöeffekter i samhällsplanering och beslutsfattande så att en hållbar utveckling främjas. Så långt allt väl.

Den mer djuplodande analysen visar att det finns ett antal kompatibilitetsproblem mellan direktivet och svensk rätt. Problemen med den svenska implementeringen gör sig gällande när detaljerna i planläggningsreglerna studeras och det finns ett antal situationer där SMB-direktivets implementering i planlagstiftningen är i konflikt med EU-rätten. Bland annat finns det frågetecken kring hur miljöbedömningsprocessen knutits till planer som 'krävs' av lag eller annan författning (vilket är i strid med ett avgörande från EU-domstolen), att undantaget för små planer används för den stora majoriteten av detaljplaner (i konflikt med bland annat kommissionens vägledning), och att miljöbedömningen knutits till enskilda planer och inte till sammanhängande planläggning (i strid med direktivets definition av 'plan'-(och program)begreppet). Begreppet omfattar allt som fångas upp av kriterierna som definierar vad som är en 'plan' och kan liknas vid en abstrakt konstruktion som endast i liten utsträckning går att jämföra med det hur ordet plan används i det svenska språket och rättssystemet. Översiktsplanens miljöbedömning verkar inte heller ges någon särskild vikt i prövningen om betydande miljöpåverkan för detaljplaner och områdesbestämmelser som inte omfattas av eller är i strid med översiktsplanen (i konflikt med EU-domstolens avgöranden kring ändringar av planer).

Såsom direktivets regler har implementerats finns det en risk att exploatering av, exempelvis, ett nytt bostadsområde inte underbyggs av en miljöbedömning om planläggningen sker genom detaljplaner. PBL ger kommunerna rätten att planlägga bostadsområden med hjälp av detaljplaner som är tydligt avgränsade till, exempelvis, bebyggelse och byggnadsverk och får inte omfatta ett större område eller vara mer detaljerad än vad som behövs med hänsyn till planens syfte och genomförandetid. Genom PBL kan kommunerna upprätta flera detaljplaner för en sammanhängande exploatering av ett område som alla är så små att de kan anses omfattas av undantaget från miljöbedömning. Sedan kan detaljplanerna hanteras sammantaget av ett planprogram som upprättas för att hantera detaljplanernas sammantagna exploatering men utan att programmet genomgår en miljöbedömning. På

så sätt riskerar en sammanhållen exploatering att aldrig genomgå en miljöbedömning trots att de sammanlagda miljöeffekterna är sådana att så borde ske. Länsstyrelsen kan inte heller utifrån svensk rätt agera emot avgränsningen av detaljplaner, i och med att den är i linje med reglerna för detaljplaner. Implementeringen medför att det skapas ett hålrum där miljöeffekterna av planer aldrig undersöks i enlighet med direktivet. Kompatibilitetsproblemen har än så länge inte uppmärksammats/prövats av ansvariga myndigheter och även om det vore rimligt att åsidosätta svensk rätt och kräva exempelvis en miljöbedömning av ett planprogram har så inte skett. Så länge den svenska implementeringen av direktivet inte ändras finns det en överhängande risk för ett underskott av åtgärder för att integrera miljöövervägande i planläggning och på så sätt nå en hållbar utveckling där exempelvis ingen nettoförlust av biologisk mångfald sker.

# Reaching for Green Chemistry

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## Abstract

This article explores the relationships between the principles of green chemistry and chemicals legislation, focusing on the REACH regulation of the European Union. Based on studies of the regulation and its implementation, as well as of research literature in the field, we evaluate if and how REACH promotes green chemistry. While both REACH and green chemistry aim for innovation and environmental and health protection, there are gaps between environmental goals and the green chemistry potential on the one hand, and the regulatory demands on the other. Despite some provisions in REACH that promote generation of knowledge and data, as well as phase-out of hazardous substances, REACH in general is a weak driver of green chemistry at present. REACH fosters less hazardous chemical synthesis and safer chemicals, but the requirements are often not stringent enough and the implementation processes are very slow and resource consuming. In addition, most green chemistry principles, including on renewable feedstocks, are not promoted by REACH. However, it would be in line with the multiple aims of REACH to promote green chemistry through e.g. higher demands on data generation, a broader inclusion of articles, stricter demands on substances and substitution, as well as a set of other amendments that promote green chemistry. The article provides a number of recommendations on how to better reach for green chemistry, and contributes to the understanding of how gaps between environmental goals and industrial practice can be better bridged by legislation, in this case eventually promoting a non-toxic environment.

**Keywords**: chemicals policy; environmental goals; green chemistry; non-toxic environment; REACH regulation; substitution

## Introduction

Environmental goals for chemical substances are generally not achieved on global, regional and national levels[1]. Despite increasing efforts over time, chemicals policy principles and instruments, as well as their implementation, are still generally insufficient in relation to existing public objectives[2]. Governmental agencies are confronted with huge challenges, from lack of knowledge and data gaps[3] to high burden of proof requirements in law[4]. The two basic components of a chemical risk assessment – intrinsic properties of

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[1] UNEP (2019) *Global Chemicals Outlook II*. Nairobi: United Nations Environment Program (UNEP); EEA (2018) *Achieving EU's key 2020 environmental objectives slipping away*. Copenhagen: European Environment Agency (EEA); SEPA (2019) *Fördjupad utvärdering av miljömålen 2019*. Stockholm: Swedish Environment Protection Agency (SEPA).

[2] Karlsson M and Gilek M (2018) Management of Hazardous Substances in the Marine Environment. In: Salomon M and Markus T (eds.) *Handbook on Marine Environment Protection: Science, Impacts and Sustainable Management*. Dordrecht: Springer.

[3] Kortenkamp A and Faust M (2018) Regulate to reduce chemical mixture risk. *Science* 361, 224–226.

[4] Karlsson M and Gilek M (2019) Mind the Gap: Coping with delay in environmental governance. *AMBIO*. Available at: https://doi.org/10.1007/s 13280-019-01265-z.

substances and exposure conditions – are seldom known, but regulatory agencies are still generally required to prove the presence of unacceptable risks before more stringent risk management measures can be implemented. Chemicals policy is thus reactive and not in line with the precautionary principle[5]. Moreover, many companies also struggle to control chemical risks, but safety measures are hampered for several reasons, not least due to complex global supply chains, where production and consumption often take part in different regions, with different policies[6]. Placing requirements on chemicals in goods assembled by products from a number of different countries and various production lines is challenging. At the same time, many chemicals are indispensable for welfare, as well as for environmental protection, making the need for development of less hazardous substances obvious. In order to improve the achievement of environmental and health objectives, in parallel with continued use of chemical substances that are essential in society, chemicals policy and substance innovation should therefore preferably be mutually supportive and promote sustainable development, including the goal of a non-toxic environment[7]. This article explores that ambition and evaluates chemicals policy in relation to one strategy of relevance in this context – green chemistry.

Green chemistry aims at designing better products, processes, materials and molecules from a sustainability point of view[8], of relevance for research, management and policy[9]. Although there is substantial potential in green chemistry[10], a lack of regulatory standards[11] and the common complexity of global supply chains[12] present implementation challenges. Chemicals policy can potentially counteract these challenges for green chemistry, as regulation has done in other cases[13], in line with the hypothesis that well-designed environmental policies can trigger innovation and thereby enhance competitive advantage[14]. This study takes green chemistry as a starting point and investigates chemicals policy and in particular if and how legislation

[5] Karlsson M (2010) The Precautionary Principle in EU and U.S. Chemicals Policy: A Comparison of Industrial Chemicals Legislation. In: Eriksson J, Gilek M and Rudén C (eds.) *Regulating Chemical Risks: European and Global Challenges*. Dordrecht: Springer.

[6] Börjeson N (2017) *Toxic Textiles. Towards Responsibility in Complex Supply Chains*. Doctoral Dissertation, Södertörn University. Stockholm: Elanders; Fransson K and Molander S (2013) Handling chemical risk information in international textile supply chains. *Journal of Environmental Planning and management* 56, 345–361.

[7] The goal is part of the Swedish environmental objectives system, and is in the EU pipeline; see e.g. SEPA (2019) op. cit.

[8] Anastas PT and Warner JC (1998) *Green Chemistry: Theory and Practice*. Oxford: Oxford University Press; Linthorst JA (2010) An overview: origins and development of green chemistry. *Foundations of Chemistry* 12, 55–68.

[9] Sjöström J (2006) Green chemistry in perspective. *Green Chemistry* 8, 130–137.

[10] Manley JB, Anastas PT and Berkeley WC (2008) Frontiers in Green Chemistry: meeting the grand challenges for sustainability in R&D and manufacturing. *Journal of Cleaner Production* 16, 743–750.

[11] Iles A (2008) Shifting to Green Chemistry: The Need for Innovations in Sustainability Marketing. *Business Strategy and the Environment* 17, 524–535.

[12] Fennelly T and Lustglass B (2015) *Advancing Green Chemistry: Barriers to Adoption and Ways to accelerate Green Chemistry in Supply chains*. A Report for the Green Chemistry & Commerce Council. Osseo: T Fennelly & Associates, Inc.

[13] Eder P and Sotoudeh M (2000) *Innovation and clean technologies as a key to sustainable development: the case of the chemical industry*. Brussels: European Commission; Karlsson M (2006) The Precautionary Principle, Swedish Chemicals Policy and Sustainable Development. *Journal of Risk Research* 9, 337–360; Tuncak B (2013) *Driving innovation. How stronger laws help bring safer chemicals to market*. Washington: CIEL; Boström M and Karlsson M (2013) Responsible procurement, complex product chains and the integration of vertical and horizontal governance. *Environmental Policy and Governance* 23, 381–394.

[14] Porter M and van der Linde C (1995) Towards a New Conception of the Environment-Competitiveness Relationship. *Journal of Economic Perspective* 9, 97–118; Iles (2008) op. cit.; Ambec S, Cohen AM, Elgie S et al. (2013)

on chemicals risk management promotes the implementation of green chemistry, or whether there exists an untapped regulatory potential or even regulatory barriers. In doing so, we aim to identify and present a set of science-based policy recommendations, which in the long run may foster a non-toxic environment.

The examination is focused on the EU, a region in which chemicals policy is considered to be at the forefront[15]. We restrict the evaluation to the most central piece of EU chemicals policy, namely the 2006 REACH regulation on industrial chemicals[16], which has been considered both comparatively ambitious[17] and internationally trend-setting[18], albeit not everywhere[19], making it a suitable study object in this context. Having been into force for more than a decade, the REACH regulation has also recently been officially reviewed, which provides sources of experience for our study, as well as opens for giving input in case of future policy development.

Other central pieces of EU chemicals regulation, or EU environmental policy at large, are not studied in this specific article[20]. Our evaluation of REACH departs from a set of commonly recognised core principles for green chemistry, which leads over to a discussion on how REACH potentially can be developed to better promote green chemistry. This improves the understanding of how chemicals policy in a broader sense can help green chemistry to play a more prominent role for achieving environmental goals, an area so far being poorly studied[21]. The study is based on an examination of the REACH regulation as such, on public documents and other sources and literature focusing on REACH implementation, as well as on research literature on green chemistry and chemicals policy and law in general.

In the next two sections, we briefly describe the basic principles of green chemistry and the REACH regulation, respectively. This is followed by the main result section, in which we evaluate the REACH regulation in relation to the principles. The article ends with a discussion with recommendations regarding future chemicals legislation.

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The Porter Hypothesis at 20: Can Environmental Regulation Enhance Innovation and Competitiveness? *Review of Environmental Economics and Policy* 7, 2–22; Fennelly and Lustglass (2015) op. cit.

[15] Bergkamp L (ed.) (2013) *The European Union REACH Regulation for Chemicals: Law and Practice*. Oxford: Oxford University Press; Karlsson and Gilek (2018) op. cit.

[16] Regulation (EC) 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC. *Official Journal of the European Union L* 396:1–849.

[17] GAO (2007) *Chemical Regulation. Comparison of U.S. and Recently Enacted European Union Approaches to Protect against the Risks of Toxic Chemicals*. Report 07-825. Washington: United States Government Accountability Office (GAO); Wilson MP and Schwarzman MR (2009) Toward a New U.S. Chemicals Policy: Rebuilding the Foundation to Advance New Science, Green Chemistry, and Environmental Health. *Environmental Health Perspectives* 117, 1202-1209; Swedish Chemicals Agency (2015) *Developing REACH and improving its efficiency – an action plan*. Report 2-15. Sundbyberg: Swedish Chemicals Agency; Karlsson and Gilek (2018) op. cit.

[18] Uyesato D, Weiss M, Stepanyan J et al. (2013) REACH's impact in the rest of the world. In: Bergkamp op. cit.

[19] Botos A, Graham JD and Illés Z (2018) Industrial chemical regulation in the European Union and the United States: a comparison of REACH and the amended TSCA. *Journal of Risk Research* 22, 1187–1204.

[20] Evidently, other parts of EU law are also central for green chemistry, for example the Industry Emission Directive, but we do not analyse these here. See however Führ M, Schenten J, Kleihauer S et al. (2018) *Integrating "Green Chemistry" into the Regulatory Framework of European Chemicals Policy*. Final draft. Darmstadt: Sonderforschungsgruppe inter-disziplinäre Institutionenanalyse.

[21] However, see ibid., as well as Choudhury AK (2013) Green chemistry and the textile Industry. *Textile Progress* 45, 3–143.

## Green Chemistry

Green chemistry[22] is a pollution prevention initiative that aims to promote sustainable development through designing chemical products and processes in a way that reduces or eliminates chemical risks and the use and generation of hazardous substances. It is a strategy that is increasingly applied since two decades, with specific journals and research and development programs[23], focusing on solving problems related to chemical pollution at the molecular level[24], but it is also relevant for management and policy[25]. Advances in green chemistry address risks in factories and products related to the presence of hazardous substances, energy and the use of fossil fuels, as well as management and policy. Antifouling boat paint without tin, fire extinguishers without freons, dry cleaning without perchloroethylene, and lumber without arsenic are examples of green chemistry solutions[26]. These efforts circle around 12 core principles of green chemistry, originally developed by Paul Anastas and John Warner[27], which outline what is considered to constitute a greener chemical, process, or product[28]:

**Table 1. 12 Principles of Green Chemistry[29]**

1. **Prevention**: It is better to prevent waste than to treat or clean up waste after it has been created ('an ounce of prevention is worth a pound of cure').
2. **Atom Economy**: Synthetic methods should be designed to maximise the incorporation of all materials used in the process into the final product, in order to avoid by-products.
3. **Less Hazardous Chemical Syntheses**: Wherever practicable, synthetic methods should be designed to use and generate substances that possess little or no toxicity to human health and the environment.
4. **Designing Safer Chemicals**: Chemical products should be designed to affect their desired function while minimising their toxicity.
5. **Safer Solvents and Auxiliaries**: The use of e.g. solvents should be rendered unnecessary wherever possible and these should be innocuous.
6. **Design for Energy Efficiency**: Energy requirements of chemical processes should be recognised for their environmental and economic impacts and should be minimised.
7. **Use of Renewable Feedstocks**: A raw material or feedstock should be renewable rather than depleting whenever technically and economically practicable.
8. **Reduce Derivatives**: Unnecessary derivatisation (e.g. temporary modification of physical/chemical processes) should be minimised or avoided, since this require additional reagents and can generate waste; natural processes are preferable.
9. **Catalysis**: Catalytic reagents are superior since they help to reduce energy needs, increase efficiency and reduce by-products.

[22] Sometimes the concept 'sustainable chemistry' is used (e.g. Umweltbundesamt (2009) *Nachhaltige Chemie*. Dessau-Rosslau: Umweltbundesamt), but it is vague and less frequently used (Linthorst (2010) op. cit).

[23] See for example the journals 'Current Opinion in Green and Sustainable Chemistry' (Elsevier), and 'Green chemistry' (Royal Society of Chemistry), as well as the program 'SusChem', available at: http://www.suschem.org/about (accessed 18/11/2019).

[24] Anastas and Warner (1998) op. cit.

[25] Sjöström (2006) op. cit.

[26] Manley JB, Anastas PT, Cue BW (2008) Frontiers in Green Chemistry: meeting the grand challenges for sustainability in R&D and manufacturing. *Journal of Cleaner Production* 16, 743–750.

[27] Anastas and Warner (1998) op. cit.

[28] Anastas PT and Eghbali N (2010) Green Chemistry: Principles and Practice. *Chemical Society Reviews* 39, 301–312.

[29] After ibid.

10. **Design for Degradation**: Chemical products should be designed so that, at the end of their function, they break down into innocuous degradation products and do not persist in the environment.
11. **Real-time Analysis of Pollution Prevention**: Analytical methodologies need to be further developed to allow for real-time, in-process monitoring and control prior to the formation of hazardous substances.
12. **Inherently Safer Chemistry for Accident Prevention**: Substances and the form of a substance used in a chemical process should be chosen to minimise the potential for chemical accidents, including releases, explosions, and fires.

These principles are to be seen as guiding tools for producers and other operators who aim for achieving less harmful substances, mixtures and products, and they may be applied differently in different contexts, even though applying all of them at the same time might be difficult to achieve[30]. The principles are also highly relevant for policy-makers, who develop regulatory frameworks that aim for chemicals safety, as well as for agencies that implement chemicals legislation. In many respects, implementing the principles promotes the goal of a non-toxic environment, which includes phasing out substances that may cause chronic toxicity (e.g. carcinogenic substances) or that may be persistent (and hence are globally dispersed) and bioaccumulative (and therefore risk to be taken up by humans and other organisms).

Whereas development and implementation of additional or more stringent chemicals regulation might not only stimulate innovation, but also impose additional costs on companies[31], the principles of green chemistry aim at enabling win-win outcomes in terms of both the environment and the economy. Chemicals legislation that applies these principles is therefore of potential importance from not only an environmental goal perspective, but also from business point of view. To what extent REACH succeeds in doing so is evaluated after the next section, which describes and comments on the regulation.

## The EU REACH Regulation

EU chemicals policy is still developing, after its emergence in the 1960s, and constitutes a legal web that today regulates production, import and use of chemical substances. Companies must comply with a broad set of laws concerning environment and public health, spanning from softer tools such as classification and labelling to comparatively strict restrictions of certain substances[32]. The legal centrepiece is the referred REACH regulation, which has been considered to be a comparatively ambitious chemicals law[33].

The REACH regulation entered into force in 2007 and replaced a number of previous EU

[30] Blum CFT and Stolzenberg H-C (2016) Sustainable chemistry: Strategies and initiatives of the German Environment Agency (UBA). Presentation at the *Green and Sustainable Chemistry Conference* in Berlin, 3–6 April 2016.

[31] European Commission (2015) *Monitoring the Impacts of REACH on Innovation, Competitiveness and SMEs. Final Report*. Brussels: Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs, European Commission.

[32] See overviews in e.g. Bergman P (2012) *Bättre EU-regler för en giftfri miljö – rapport från ett regeringsuppdrag*. Report 1-12. Sundbyberg: Swedish Chemicals Agency; Biedenkopf K (2018) Chemicals: Pioneering Ambitions with External Effects. In: Adelle C, Biedenkopf K and Torney D. (eds.) *European Union External Environmental Policy. The European Union in International Affairs*, pp. 189–208. London: Palgrave Macmillan.

[33] Wilson and Schwarzman (2009) op. cit.; Karlsson M (2010) op. cit.; Bergkamp (2013) op. cit.; Swedish Chemicals Agency (2015) op. cit.; Filipec O (2017) *REACH Beyond Borders – Europeanization Towards Global Regulation*. Dordrecht: Springer. For overviews see also Nilsson A (2010) Reach och hållbar kemikaliehantering. In: Ebbesson J and Langlet D (eds.) *Koll på kemikalier? Rättsliga förändringar, möjligheter och begränsningar*. Uppsala: IUSTUS.

laws that among other things differentiated between so-called existing and new substances, the former being hardly controlled with respect to health and the environment. REACH aims to promote a high level of protection of human health and the environment, alternative methods to assess hazards, as well as free movement on the EU internal market, enhanced competitiveness and innovation (Article 1[34]). The market orientation of REACH is founded on the treaty and expresses the EU harmonisation ideal, which also means that the regulation falls into the category, in e.g. the European Commission, of industry affairs and growth issues, rather than the environment[35]. REACH includes four key building blocks: registration, evaluation, authorisation and restriction of chemicals. It also regulates information flow in supply chains, including a consumer's right to information, as well as confidential business information[36]. A specific agency, the European Chemicals Agency (ECHA), is set up for governing the regulation (Articles 75–111) in parallel with the European Commission and the EU Member States.

The provisions in the registration block promote a "no data, no market" principle for the substances and mixtures that are targeted by REACH (Article 5). Under certain conditions, the same applies to substances in "articles" (i.e. products on the market), if an article is intended to release a substance under normal and foreseeable use, provided a certain total quantity per year, or if the article contains certain levels of particularly harmful substances (Article 7). For previously existing (so-called phase-in) substances and mixtures, a gradual transition period has recently passed. For example, requirements on producers and importers applied from 2010 for substances being toxic (carcinogenic, mutagenic, reproductive toxins or very toxic to aquatic organisms), in quantities over 1 tonne, or manufactured or imported in high quantities (above 1000 tonnes per year and producer or importer), and from 2018 for substances in quantities between 1 and 100 tonnes (Article 23). The current (November 2019) number of REACH registrations is 96761 (dossiers), of which 22468 are unique substances[37]. For substances in quantities above 10 tonnes, a comparatively comprehensive Chemical Safety Report (describing e.g. intrinsic substance properties, exposure scenarios and management recommendations) is required (Article 14), while for the 1–10 tonne interval, a more rudimentary Technical dossier (with basic data) is compulsory (Article 10). Despite the aims of REACH, much falls outside the scope of the regulation, such as polymers and substances in lower quantities (e.g. Article 2), and chemicals assumed to be sufficiently covered by other laws (such as pesticides). In addition, data requirements are often insufficient in relation to the risk management objectives of the regulation[38], registration

[34] REACH references in this article are made to the consolidated version of REACH of July 2, 2019 (02006R1907 — EN — 02.07.2019 — 041.001 — 1), available at: https://eur-lex.europa.eu/legal-content/en/TXT/PDF/?uri=CELEX:02006R1907-20190702&qid=1565790018151&from=EN (accessed 18/11/2019).

[35] The original basis for REACH is article 95 in the Treaty Establishing the European Community, presently replaced by article 114 in the Treaty on the Functioning of the EU.

[36] The following overview focuses on the key elements of REACH in relation to the aims of the present article; for more comprehensive descriptions or detailed analysis, see e.g. Karlsson (2010) op. cit. and Bergkamp (2013) op. cit.

[37] See the database at the European Chemicals Agency (ECHA): https://echa.europa.eu/information-on-chemicals/registered-substances (accessed 18/11/2019).

[38] Lahl U and Zeschmar-Lahl B (2013) Risk based management of chemicals and products in a circular economy at a global scale (risk cycle), extended producer responsibility and EU legislation. *Environmental Sciences Europe* 25:3; Rudén C and Hansson SO (2010) Registration, Evaluation, and Authorization of Chemicals (REACH) is but the first step – how far will it take us? Six further steps to improve the European chemicals legislation. *Environmental Health Perspectives* 118, 6–10.

requirements are often not adequately met[39], and the transparency of data is often limited[40].

In the evaluation block, the ECHA carries out a compliance check of registration dossiers (Article 41) and evaluates any existing animal testing proposals (Article 40), whereas EU Member States may evaluate risks associated with registered substances (Article 45). The compliance check targets a low percentage of the registered substances but still reveals a striking non-compliance with legal requirements[41]. If the evaluation shows that e.g. more information is needed or that there are reasons for concern, further data can be required (Articles 41, 50). The evaluation follows a so-called Community Rolling Action Plan (Article 44) that so far lists 375 substances, of which conclusions have been finalised for 105, i.e. for less than 1 percent of all registered substances[42]. For several of these, the conclusion is drawn that regulatory follow up is needed[43], which may eventually lead to authorisation or restriction requirements.

When it comes to the authorisation block, the focus is placed on 'substances of very high concern' (SVHCs) (Article 55), i.e. substances that may have serious effects on human health or the environment. The criteria for a SVHC are detailed in the regulation, and SVHCs include substances that are carcinogenic, mutagenic or toxic for reproduction (CMRs), persistent, bioaccumulative and toxic (PBT), very persistent and very bioaccumulative (vPvBs), or that cause equivalent concern (Article 57). Such substances are to be placed on a 'candidate list' (CL) (Article 59), from which a prioritisation is to be made before a substance, after a specific decision (Article 58), ultimately may be targeted for authorisation. Once listed (Annex XIV), importers or downstream users wanting to use a substance for a specific purpose must seek authorisation, which may be limited to certain uses and articles, but this does not automatically apply when a substance is present in an imported article[44], which illustrates that REACH is not set up in order to control chemicals in global supply chains[45]. Moreover, an authorisation in an individual case generally presumes that risks to health and the environment are 'adequately controlled', except for SVHCs that are PBT, vPvB or CMRs, where a threshold cannot be determined. In the latter case – or when control is not adequate – authorisation depends on the risks being outweighed by socio-economic benefits and on a lack of available substitutes. Placing substances on the CL or in Annex XIV, as well as authorisation processes, are often preceded by time and resource consuming anal-

[39] European Commission (2018a) *Commission Staff Working Document accompanying "Commission General Report on the operation of REACH and review of certain elements. Conclusions and Actions." COM(2018) 116 final*. SWD(2018) 58 final. Part 1/7. Brussels: European Commission; UBA (2015) *REACH Compliance: Data Availability of REACH Registration. Part 1: Screening of chemicals > 1000 tpa*. Dessau-Roßlau: Umweltbundesamt (UBA); UBA (2018) *REACH compliance: Data availability in REACH registrations. Part 2: evaluation of data waiving and adaptations for chemicals > 1000 tpa*. Dessau-Roßlau: Umweltbundesamt (UBA).

[40] Ingre-Khans E, Ågerstrand M, Beronius A et al. (2016) Transparency of chemical risk assessment data under REACH. *Environmental Science: Process and Impacts* 18, 1508–1518.

[41] ECHA (2018) *Evaluation under REACH: Progress Report 2017. 10 years of experience*. Helsinki: European Chemicals Agency (ECHA).

[42] See ECHA at: https://echa.europa.eu/information-on-chemicals/evaluation/community-rolling-action-plan/corap-table (accessed 18/11/2019).

[43] Ibid; see further in the various documents for substances with evaluations that are concluded.

[44] Molander L and Rudén C (2012) Narrow-and-sharp or broad-and-blunt. Regulations of hazardous chemicals in consumer products in the European Union. *Regulatory Toxicology and Pharmacology* 62, 523–531; Molander L, Breitholz M, Andersson PL et al. (2012) Are chemicals in articles an obstacle for reaching environmental goals? Missing links in EU chemical management. *Science of the Total Environment* 435–436, 280–289.

[45] Boström and Karlsson (2013) op. cit.

ysis and inefficient negotiations, often involving lengthy discussions in e.g. a Committee for Risk Assessment and a Committee for Socioeconomic Analysis (Articles 60, 64). Furthermore, the substitution requirements (Articles 55, 60) in the regulation are weak and only apply under specific conditions; for example, a substitution plan is to be developed only if a safer alternative is identified by the applicant, meaning that the burden of proof for substitution generally rests on the regulators[46].

Since the ECHA, Member States and the European Commission regularly negotiate and often disagree on how to assess and interpret substance properties and risks[47], the practice of REACH does not guarantee that a substance meeting the stipulated criteria is authorised as intended[48]. All in all, a number of different problems and challenges with the authorisation requirements and processes in the REACH regulation have been pointed out by researchers, as well as the European Commission and competent agencies in different Member States[49]. Currently (November 2019), the CL contains 201 substances[50], including some bromated flame-retardants and phthalates, and 43 substances[51] have been placed on the authorisation list (REACH Annex XIV). The contrast to the 1400 substances that the European Commission initially estimated would be targeted for potential authorisation is striking[52]. Still, the REACH authorisation requirements have meant that several companies have improved their control of SVHCs and that substitution in a number of cases most likely has been generally promoted[53].

Under the restriction block, EU Member States, the ECHA or the European Commission may call for measures first when there is a sufficiently well proven 'unacceptable risk' to the environment or to human health, irrespective of whether the substance in question is subject to registration demands or not (Article 68). However, there are no uniform criteria for what

[46] Karlsson (2010) op. cit.; Hansson SO, Molander L and Rudén C (2011) The substitution principle. *Regulatory Toxicology and Pharmacology* 59, 454–460; Swedish Chemicals Agency (2015) op. cit.; Tickner J and Jacobs M (2016) *Improving the Identification, Evaluation, Adoption and Development of Safer Alternatives: Needs and Opportunities to Enhance Substitution Efforts within the Context of REACH*. Lowell: Lowell Center for Sustainable Production University of Massachusetts.

[47] For example, the results from different risk assessments for the same substance may differ significantly; see e.g. Beronius A, Rudén C, Håkansson H et al. (2010) Risk to all or none? A comparative analysis of controversies in the health risk assessment of bisphenol A. *Reproductive Toxicology* 292, 132–146.

[48] Karlsson (2010) op. cit.; Swedish Chemicals Agency (2015) op. cit.

[49] Molander L and Rudén C (2012) op cit.; Bergkamp L and Herbatschek N (2014) Regulating Chemical Substances under REACH: The Choice between Authorization and Restriction and the Case of Dipolar Aprotic Solvents. *Review of European Community & International Environmental Law* 23, 221–245; Gabbert S, Scheringer M, Ng CA et al. (2014) Socio-economic analysis for the authorisation of chemicals under REACH: A case of very high concern? *Regulatory Toxicology and Pharmacology* 70, 564–571; Swedish Chemicals Agency (2015) op. cit.; Klika C (2015) The Implementation of the REACH Authorisation Procedure on Chemical Substances of Concern: What Kind of Legitimacy? *Politics and Governance* 3, 128–138; Gabbert S, and Hilber I (2016) Time matters: A stock-pollution approach to authorisation decision-making for PBT/vPvB chemicals under REACH. *Journal of Environmental Management* 183, 236–244; European Commission (2018b) *Commission Staff Working Document accompanying "Commission General Report on the operation of REACH and review of certain elements. Annex 4." COM(2018) 116 final*. SWD(2018) 58 final. Part 5/7. Brussels: European Commission.

[50] See ECHA at https://echa.europa.eu/candidate-list-table (accessed 18/11/2019).

[51] See ECHA at https://echa.europa.eu/authorisation-list (accessed 18/11/2019).

[52] European Commission (2001) *Strategy for a future Chemicals Policy. White Paper*. COM (2001)88. Brussels: European Commission.

[53] CSES, RPA and Ökopol (2015) *Monitoring the Impacts of REACH on Innovation, Competitiveness and SEMs. Final Report*. Brussels: European Commission; Mistry R, Moerman H, Novak A et al. (2017) *Impacts of REACH Authorisation. Final Report*. Brussels: European Commission; European Commission (2018b) op. cit.

makes a risk 'unacceptable'[54], and decisions shall consider socio-economic impacts, including the availability of alternatives (Article 68). As for the authorisation block, the restriction process is complex and often time and resource consuming (Articles 70–73), meaning that the efficiency is low, also when the scientific evidence of problems or risks is strong[55]. The burden of proof rests strongly on the public side in this case. Consequently, as few as 70 entries[56] (November 2019) in the restriction annex (XVII) of REACH show all the restriction decisions that have been adopted for a substance, a group of substances or a substance in a mixture, which may also apply to articles containing the substance, rarely also including imported ones[57].

In addition to the four basic building blocks outlined above, REACH contains a number of provisions that focus on improving the flow of information along supply chains. One example is that suppliers of articles containing substances on the CL (above 0.1 weight-per cent in any specific component of the article[58]) must provide information business to business on the presence of the substance and on how to safely use the article in question (Article 33:1). Moreover, consumers have the right to receive free information within 45 days about whether a SVHC is present (above 0.1 weight-per cent) in an article for sale (Article 33:2). These various stipulations improve the access to data. Conversely, the provisions in REACH on confidential business information partly restrict the right to request certain data (e.g. Article 118).

Finally, REACH sets out a number of review mechanisms (see e.g. Article 138) and the European Commission was obliged to carry out an initial analysis after five years, and a major review after ten years, which was finalised in 2018. In the former, clear improvements of EU chemicals risk management, compared to previous chemicals legislation, were identified, but significant shortcomings were also shown[59]. The recent, comprehensive, review[60] concluded that REACH has led to improved data along supply chains and safer products for consumers, workers and the environment, including through banning and substituting certain hazardous substances, but also that further measures need to be taken to e.g. improve the quality of data and simplify various processes[61]. The review is now a target for debate and dialogue between the various EU institutions and concerned stakeholders, and it remains to be seen what the incoming European Commission will conclude on the topic[62].

[54] An elaboration on this can be found in Hansson SO and Rudén C (eds.) (2005) *Better Chemicals Control Within REACH*. Stockholm: KTH Royal Institute of Technology.

[55] Karlsson (2010) op. cit.; Bergkamp and Herbatschek (2014) op. cit.; Swedish Chemicals Agency (2015) op. cit.; Goldenman G, Holland M, Lietzmann J et al. (2017) *Study for the strategy for a non-toxic environment of the 7th Environment Action Programme*. Final Report. Brussels: European Commission; European Commission (2018b) op. cit.

[56] See ECHA at: https://echa.europa.eu/substances-restricted-under-reach (accessed 18/11/2019).

[57] The total number of restrictions in the EU over time is higher; the figure here refers to decisions under REACH since it was enacted.

[58] The judgement of the European Court of Justice, case C-106/142 (9/10 2015) clarified the scope of these provisions.

[59] See e.g. European Commission (2013) *Commission Staff Working Document General Report on Reach. SWD(2013)25. FINAL*. Brussels: European Commission.

[60] The various review documents are accessible at: https://ec.europa.eu/growth/sectors/chemicals/reach/studies_en (accessed 18/11/2019).

[61] See the summary of the European Commission (2018): "Ten years of REACH: making chemicals safer for consumers, workers and the environment" at: http://europa.eu/rapid/press-release_IP-18-1362_en.htm.

[62] Beyond the references above to the European Commission (2018a; 2018b), it remains outside the scope of this article to describe details of the review, and to elaborate on possible outcomes.

## Evaluating REACH in Relation to Green Chemistry

Green chemistry has developed into a broad framework that covers several dimensions, from molecules to management. However, little research is so far linking green chemical design to policy and law, which justifies the focus of this article, namely, to evaluate REACH in relation to the referred twelve principles of green chemistry. The approach we take belongs to what can be labelled "law reform research", which in our case implies interdisciplinary applied research about the law, aiming for identifying potential inefficiencies and related solutions, based on doctrinal methodology with deductive reasoning[63]. In the following, we evaluate whether the 12 principles of green chemistry (which thus are used as criteria for the evaluation), one by one, are expressed in or promoted by REACH (which is the object that is evaluated)[64]. This is done by focusing on the regulatory text as such, as well as the state of implementation and the doctrine referred to in the previous section. The evaluation constitutes the basis for our discussion and recommendations.

The first principle, *prevention*, might seem quite general and the topic has been on the environmental policy agenda for a long time, but in the context of green chemistry, waste is to be reduced by improving chemical synthesis, which is more specific than conventional waste prevention. One indicator sometime used here is the 'E-factor', measuring the weight of waste per kilogram of the desired product, and the synthesis of ethylene dioxide is a commonly referred example, in which the use of new input substances led to 16 times less waste generated[65]. It is evidently natural to consider principle 1 as relevant for chemicals policy. REACH at present, however, targets the substances, mixtures and articles that result from industrial processes, and not the industrial synthesis processes as such[66]. Similarly, principle 2 on *atom economy*, 6 on *energy efficiency*, 7 on *renewable feedstock* and 9 on *catalysis* are all strongly linked to chemical synthesis, but much less linked to the final industrial outcomes that at present fall under the scope of REACH. Consequently, for these five principles (1, 2, 6, 7 and 9), REACH is hardly relevant in its current state. No provision in REACH is found to give any clear guidance or direction for chemical synthesis as such, which creates a gap between the potential of green chemistry and current regulatory incentives, as far as industrial chemicals policy is concerned[67]. While REACH on the one hand focuses on market harmonisation (and thus on the outputs from chemicals industry, which circulate on the markets, rather than on the input substances), and on the other on health and the environment (and therefore also on the output, which people and other organisms are exposed to), this set up may seem natural. However, considering the broader dual objectives of REACH to promote both innovation and environment, this arrangement is not necessarily given. Companies generally gain from being stimulated to innovate and economise along the entire product chain, and from an environmental point of view,

[63] See e.g. Chynoweth P (2008) Legal Research. In: Knight A and Ruddock L (eds.) *Advanced Research Methods in the Built Environment*. Oxford: Wiley-Blackwell.

[64] On environmental law methodology, see also McGrath C (2007) *Does environmental law work? How to evaluate the effectiveness of an environmental law system*. Saarbrücken: Lambert; and Nilsson A (2011) *Enforcing Environmental Responsibilities. A Comparative Study of Environmental Administrative Law*. Academic Thesis. Department of law. Uppsala: Uppsala University.

[65] Anastas and Eghbali (2010) op. cit.

[66] See also Lahl and Zeschmar-Lahl (2013) op. cit. on waste and risk cycles.

[67] However, see European Union policy and legislation on e.g. eco-design and regarding products at: https://ec.europa.eu/growth/industry/sustainability/ecodesign_en (accessed 18/11/2019).

the principles of green chemistry show that risks can be reduced from measures throughout life cycles of products. A well-designed regulatory development in line with these five green chemistry principles could therefore simultaneously promote both the innovation and environmental objectives of REACH[68].

Turning to the remaining principles that we evaluate, five of them (3, 4, 5, 8 and 10) are relevant for not only chemical synthesis as such, but also for emissions from industrial processes and for the environmental and health characteristics of REACH-regulated substances, mixtures and articles. They fall within the scope of REACH and are more or less promoted by various stipulations. The ambition in principle 3 to promote *less hazardous chemical syntheses*, i.e. to design methods to use and generate substances that possess little or no toxicity to human health and the environment, has clear relevance for both processes and products. While REACH with some exceptions is less relevant for the choice of substances used as inputs in a specific process, the regulation is significant for the substances and mixtures that are ultimately generated, for example, through the registration requirements in REACH and, potentially, through various other types of risk reducing provisions, including in the authorisation and restriction blocks. The latter is even more obvious for principle 4, *designing safer chemicals*, which means that chemical substances and mixtures should be produced in a way that minimises their eventual toxicity, and potentially also their persistency and potential to bioaccumulate. This principle is promoted by the CL and the authorisation and restriction requirements, despite regulatory inefficiencies and the fact that quite few substances are targeted so far. As an example, a group of substances managed here is the phthalates, which are used as e.g. plasticisers, of which several are classified as toxic to human reproduction. Some of these are restricted (e.g. DEHP, a reproductive toxicant) whereas others are placed on the authorisation (e.g. DIPP) or candidate (e.g. DCHP) lists. In these cases, promising substitutes are being developed, even though it remains to be seen how safe these are over time. It is also important to note, that for example DEHP was proposed to be restricted already under pre-REACH EU chemicals policy, in 2001, which illustrates how ineffective chemicals policy sometimes is[69]. Concerning principle 5, *safer solvents and auxiliaries*, avoidance of unnecessary auxiliary substances does not automatically follow from REACH, but REACH affects the ambition to use non-hazardous substances because products commonly contain more or less residues from production processes. Here, the authorisation requirement for the solvent formaldehyde provides one illustration[70]. In the case of principle 8, on *reducing derivatives*, REACH does not say much, but the regulation may be relevant in some cases. One example is derivates of benzotriazoles that may be used as UV stabilisers in e.g. textile fibres, of which at least one (2-(2H-benzotriazol-2-yl)-4,6-ditertpentylphenol) is on the CL[71]. Finally, REACH is of importance for principle 10 on *design for degradation*, foremost the various provisions promoting avoidance of persistent substances. The restric-

[68] Here, indicators for these principles, such as the referred E-factor, or the 'Atom efficiency' (which is the ratio of the molecular weight of the desired product over the molecular weights of all reactants used in the reaction), for principle 2, could be used to measure progress over time see e.g. Anastas and Eghbali (2010) op. cit.

[69] Swedish Chemicals Agency (2001) *Risk Reduction Strategy for DEHP*. Draft 2 July 2001. Stockholm: Swedish Chemicals Agency.

[70] See ECHA, at: https://echa.europa.eu/sv/substance-information/-/substanceinfo/100.105.544 (accessed 18/11/2019).

[71] See ECHA at: https://echa.europa.eu/information-on-chemicals/candidate-list-substances-in-articles-table (accessed 18/11/2019).

tion of decaBDE, a hazardous brominated flame retardant, is an example of this[72], even though, as in the case of DEHP, it took several years to reach that decision[73]. To summarise, these five principles (3, 4, 5, 8 and 10) are promoted by the regulation, but REACH could be more stringent and its implementation could be improved.

The remaining two principles, number 11 (on *analytical methods*) and 12 (on *accident prevention*) are of different type and have almost no link to the objectives of REACH.

While the evaluation above shows that certain requirements in REACH indeed promote some of the green chemistry principles, the regulation is far from explicitly designed for doing so, and the implementation is everything but optimal. We will now discuss how to potentially improve the situation.

## Discussion

This article evaluates if and how REACH is a tool that promotes green chemistry. While we show that REACH, just as green chemistry, aims for both innovation and protection, the overall conclusion is that REACH is a weak driver of green chemistry. There are evident gaps between environmental goals and the green chemistry potential on the one hand, and regulatory requirements on the other.

Considering the four key building blocks in REACH, the provisions on registration require companies to generate data, which can be helpful for implementation of the green chemistry principles, since knowledge on substance properties is often missing. For high-quantity substances and SVHCs, REACH also stimulates data and information flows along supply chains, which helps producers, procurers and various other institutions to foster green chemistry. However, the registration block contains no explicit elements that relate to the green chemistry principles, and the data demands for most substances are either weak or non-existent. In particular the latter is problematic since also substances that sometimes are used in small quantities may have e.g. CMR properties, and therefore constitute risks. Moreover, the registration demands do not address potential effects of exposure to chemical cocktails[74], which are crucial to explore and describe in order to encourage green chemistry (e.g. principle 4). The REACH evaluation block also generates knowledge and data of value for green chemistry, but it includes comparatively few substances, which impede implementation of further risk reduction measures in the regulation.

Regarding the authorisation and restriction blocks, REACH is more relevant for green chemistry than when it comes to registration and evaluation, since the regulation explicitly identifies problematic substances and thereby signals them as more or less undesirable. It is for example reasonable for companies to expect that SVHCs on the CL sooner or later will be targets for additional control measures, such as authorisation requirements, even though these initially may be characterised by exemptions. Just as for evaluations, however, quite few substances have been targeted so far. The number of restrictions under REACH is also very low, given what science shows is needed in order to reach public environmental goals. Nevertheless, the regulatory set-up of REACH generally stimulates innovation away

[72] See ECHA at: https://echa.europa.eu/sv/substance-information/-/substanceinfo/100.013.277 (accessed 18/11/2019).

[73] See further about the decaBDE story in Eriksson J, Karlsson M and Reuter M (2010) Technocracy, politicization, and non-involvement: politics of expertise in the European regulation of chemicals. *Review of Policy Research* 27, 167–185.

[74] Swedish Chemicals Agency (2015) op. cit.; Kortenkamp and Faust (2018) op. cit.

from substance properties included in the SVHC criteria.

All in all, REACH promotes certain green chemistry principles, in particular 3 (less hazardous chemical syntheses), 4 (designing safer chemicals) and 10 (design for degradation), even if the implementation so far is weak. There is moreover an untapped regulatory potential in REACH, in relation to several of the twelve principles. Even if REACH at present is not particularly relevant for waste prevention, atom economy, energy efficiency, renewable feedstock and catalysis, several of these five principles could be expressed in the regulation, because they relate closely to the regulations' dual objectives. For example, provisions are possible to formulate to steer towards renewable feedstocks, in line with the scope of REACH and in order to protect the environment and promote the economy, for example as a requirement to first hand seek to avoid fossil fuel-based polymers, as a kind of a substitution requirement.

There is thus room for improvements of REACH in order to promote green chemistry. To be more specific, not least the following measures and legislative amendments are conceivable as helpful for closing the goal-regulatory gaps identified:

- A general requirement on operators, to continuously strive towards producing and importing less hazardous substances, mixtures and articles. Expressing such a responsibility for continuous improvements is not uncommon in environmental law and would not be incompatible per se with a market oriented regulation.
- Fewer exemptions in REACH for specific categories of chemicals that are not regulated elsewhere with the same degree of protection as required by REACH, and a legal duty on operators to register also substances in lower quantities than 1 tonne per company and year. This stimulates knowledge and data generation.
- Inclusion of substances in articles in a more comprehensive manner in REACH, including for imported articles. This broadens the reach of the regulation to areas of relevance for ordinary consumers and public health, but also benefits forerunner companies that strive for phasing out for example SVHCs from articles.
- Increased data requirements for REACH registration, in relation to all quantities. This enables improved evaluation, as well as more rapid risk assessment processes and better outcomes, in turn incentivising green chemistry.
- Stringent demands on general and early substitution in REACH, and refusal of substance authorisation when less hazardous, well-known substitutes exist. Requirements are needed not only regarding authorisation, but also within the registration block, e.g. provisions on providing substitution plans early on. Due to the general lack of knowledge and data, it is important to develop a group-based approach, as a precautionary default in cases of uncertainty, in order to avoid regrettable substitution[75].
- Upgraded criteria for SVHC, for example, by including endocrine disrupting substances as SHVCs, and by broadening the coverage of P and B substances. It is also important to ensure that potential effects of mixtures of substances – e.g. when the toxicological effect of the mixture risks being greater than the sum of the

[75] To describe this, "[c]hemical substances can be grouped together in many different ways, such as by chemical structure, (eco)toxicological properties, function or areas of use [in order to] streamline work, and to prevent a substance with undesirable properties from being replaced with another substance of similar properties." From: Chemicals Agency (2018) *Grouping of chemical substances in the REACH and CLP regulations*. Report 2-18. Sundbyberg: Swedish Chemicals Agency.

effects of individual substances – are assessed and managed here.
- Increased transparency regarding data provided by industry and agencies, and enhanced responsibility to disseminate this information up and down supply chains. This facilitates for product designers to apply the green chemistry principles.

With amendments of REACH like these, which of course need to be developed in detail, the role of regulatory agencies becomes more active and many hazardous substances become less competitive. In parallel, it is important to reform the processes and the roles of the main committees under the REACH regulation, which at present operate in a too time and resource consuming manner.

The outcome of amendments like these likely strengthens the economic incentives for companies to invest in green chemistry research and green product design. Management measures taken by companies are namely helped by improved precision on what is to be considered as unacceptable risks and substances, and by improved access to information along supply chains. A well-designed policy and legal development along these lines thus incentivises substitution, stimulates research and innovation and enhances competitiveness among forerunners.

To conclude, substantial amendments of the REACH regulation are needed to set a legal structure that truly promotes green chemistry. Such changes are achievable if a revision process starts after the recently finalised REACH review, with a newly elected European Parliament and a new incoming European Commission. From a broader point of view, this fits well with EU's general intentions to be an international forerunner in the field of environmental policy in general and of chemicals policy in particular. Considering that the EU constitutes one of the largest markets in the world, and since REACH is internationally trend-setting, many companies likely benefit from such regulatory development, in addition to the gains from public and environmental health point of view that follow, all in all promoting a non-toxic environment.

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# Ought states to be legally obliged to protect the sustainability of the global environmental system?

*Nicolai Nyland**

## I. Abstract and introduction

My opinion is that there is a need to reformulate the traditional paradigm of international law, which is that states have sovereignty over the environment within their territory and jurisdictional areas.[1]

I propose a new paradigm, based on the nature of the global environmental system, scientific proof of environmental destruction, and an untraditional interpretation of the existing sources and principles of international law. A duty for states to protect the sustainability of the global environmental system would reframe the legal relationship between states and the environment. It would entail a shift away from state rights of sovereignty over their environment to a duty for states to protect the global environment. I aim to show that the shift in perspective may find a legal basis in an untraditional interpretation of existing sources of international law.

The suggested paradigm would not replace sovereignty as a legal concept. It would rather be a reinterpretation or reframing of it, emphasizing the duty to protect the environmental sovereignty- the sustainability- of all states. States have not consented to it. It is a proposal with a view to the future law.

I also briefly explain how a new paradigm would entail that states have to protect a minimum of environmental quality sufficient to uphold nature's carrying capacity, that it could challenge the existing rule of burden of proof in international law, and provide new approaches to international law-making and interpretation.

## II. The traditional view is that states have sovereignty over their own environment

The basis of international law is the principle of sovereignty, which consists of:

> "(1) A jurisdiction, prima facie exclusive, over a territory and a permanent population living there; (2) a duty of non-intervention in the area of exclusive jurisdiction of other states; and (3) the dependence of obligations arising from customary law and treaties on the consent of the obligor."[2]… "The rules of law binding upon states therefore emanate from their own free will as expressed in conventions or by usages generally accepted as expressing principles of law."

States are not subject to the will of other states. They are independent and have an exclusive right to decide upon factual and legal matters within the territories and areas under their jurisdiction. Thus, states cannot exercise sovereignty over the territories of other states. States have a right to be free from the interference of others.

This also holds true for the legal relationship between states and the environment. As a main

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[1] In this article "*their environment*" or "*territory*" also encompass the jurisdictional areas/spheres of influence, in which states exercise control over the environment, i.e. exercise their governmental powers.

[2] James Crawford, "Brownlie's Principles of Public International Law", 9th Edition, Oxford University Press, p. 431.

rule or starting point, states may choose how to treat the environment within their territories, or the domains of their exclusive jurisdiction.

This view rests on the premise that it is possible to divide the global environment into geographically defined state territories and areas outside state territories, disregarding scientific realities.

Under this regime, states do not have a duty to protect their own environment. They have a right to interfere with the environment in accordance with their own free will. States have a right to pollute their own territories at self-determined levels. The right of states to exploit and freely manage the natural resources within their territory is reflected in the principle of Permanent Sovereignty over Natural Resources, "PSNR".

The origin of the PSNR principle lies in the decolonization process, which accelerated in the 1960s. An important part of the liberation of the former colonies was to afford them with full sovereignty over their own natural resources. States frequently refer to this principle when they argue that other states and international organizations have no power to decide how they treat their own environment. In the Armed Activities on the Territory of the Congo (Democratic Republic of the Congo v. Uganda) case, the International Court of Justice acknowledges the customary law character of PSNR, as reflected in General Assembly resolution 1803 (XVII) of 14 December 1962 on PSNR. This resolution states that:

> "The right of peoples and nations to permanent sovereignty over their natural wealth and resources must be exercised in the interest of their national development and of the wellbeing of the people of the State concerned."[3]

The wording of the resolution implies that states have a sovereign and absolute right to exploit their environment and to maximize profit derived from this. Even though this statement is from 1962, some states openly regards this position as tenable today. In a speech at the 74th session of the U.N. General Assembly on 24 September 2019 Jair Bolsonaro, president of Brazil, rejected "*calls for foreign intervention in the burning Amazon, telling world leaders his country would use the rainforest's resources as it sees fit*."[4] After the international community considered the Amazon fires a global environmental crisis, Bolsonaro reversed course and declared, "*Protecting the rain forest is our duty*."[5] The two statements reflect the growing concerns about the global environmental effects of environmental interferences taking place within states, and the rejection of an absolute interpretation of the principle of PSNR.

The consequence of an absolute sovereignty over the environment would be that every state, in accordance with international law, would be free to exploit all of its natural resources and destroy the natural environment on its territory.[6]

Under the traditional regime however, states are prohibited from causing considerable damage to the environmental integrity of other states. The principle of territorial integrity – the sovereign right to be free from interference of the other states, is the flip side of the principle of territorial sovereignty- the PSNR right for states to interfere in "*their own*" environment.

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[3] Armed Activities on the Territory of the Congo, ICJ Reports 2005, p. 168, The resolution: https://www.ohchr.org/Documents/ProfessionalInterest/resources.pdf (accessed 13 December 2019).

[4] https://www.washingtonpost.com/world/the_americas/brazils-bolsonaro-tells-world-leaders-at-the-un-that-the-amazon-is-not-under-fire-but-full-of-riches/2019/09/24/2bddfa34-ded0-11e9-be7f–4cc85017c36f_story.html (accessed 13 December 2019).

[5] https://www.nytimes.com/2019/08/23/world/americas/brazil-military-amazon-fire.html (accessed 13 December 2019).

[6] Hans Christian Bugge, "Lærebok i miljøforvaltningsrett", 3rd Edition, Oslo 2011, p. 68.

This is encapsulated in the so-called no harm rule, first laid down in the Trail Smelter Case.[7]

Principle 21 of the 1972 Stockholm declaration on the Environment, Article 3 of the Convention on Biological Diversity, and Principle 2 of the Rio Declaration on the Environment and Development all reflect the principle of PSNS and the no harm rule. Principle 2 in the 1992 Rio Declaration states that:

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

In the Nuclear Weapons case of 1996, the ICJ concluded that, "*the existence of the general obligation of States to ensure that activities within their jurisdiction and control respect the environment of other States or of areas beyond national control is now part of the corpus of international law relating to the environment*."

Phillippe Sands and Jacqueline Peel claims that, following the advisory opinion on the Legality of Nuclear Weapons "*there can be no question but that Principle 21 reflects a rule of customary international law, placing international legal constraints on the rights of states in respects of activities carried out within their territory or under their jurisdiction*."[8]

Malgozia Fitzmaurice categorically asserts that the no harm rule is one of "*the few uncontested norms of international environmental law*".[9] Akehurst/Malanczuk says that *Principle 2 (Rio) confirms the prohibition of transboundary environmental harm laid down in Principle 21 of the Stockholm Declaration which is now recognized as customary law reflecting the principle of limited territorial sovereignty and integrity, but only as so far as 'substantial' transboundary harm is involved*."[10] Christina Voigt is more careful, and regards it as defendable to view the no harm rule as part of customary law.[11]

In accordance with the principles and statements above, states may exploit their own environment, but cannot exercise their environmental sovereignty in a way that substantially diminishes the environmental quality of other states. States have a duty to exercise governance and control – "*sovereignty*" over their territories – "*their environment*" – in order to fulfill their duty to respect the environmental sovereignty of other states.

At least in theory, the sovereign right for states to exploit their own natural resources, PSNR, and in a broad sense their environment, pursuant to their own environmental and developmental policies, is limited by their duties under international law to respect the environment of other states and of areas beyond the limits of national jurisdiction. Under this no harm rule, states must exercise sovereignty over their territorial environment within the limits of international law, cf. "*in accordance with… the principles of international law*" in Rio Principle 2.

Due to the relatively rapid deterioration of

[7] Trail Smelter Arbitration, USA v. Canada, 1941, 3 R.I.A.A 1938, p. 157.

[8] Phillippe Sands and Jacqueline Peel, "Principles of International Environmental Law", 4th Edition, Cambridge University Press 2018, p. 206.

[9] Malgosia Fitzmaurice, "International Responsibility and Liability", in "The Oxford Handbook of International Environmental Law", Daniel Bodansky, Jutta Brunnée, and Ellen Hey Editors, Oxford University Press 2007, p. 1013.

[10] Peter Malanczuk, "Akehurst's Modern Introduction to International Law", 7th Edition, London 1997, p. 251.

[11] Christina Voigt, "State Responsibility for Climate Change Damages", Nordic Journal of International Law 77, 2008, p. 10.

the quality of the global environment however, it is apparent that many states do not comply with their obligation to protect the environment outside their own territories. In my opinion, Sands and Peel understates this fact: "*consistent state practice is not readily discernible*".[12] Perrez puts it more bluntly. He says that the traditional concept of protecting the environmental integrity of states by prohibiting significant transboundary damage has lost its effectiveness.[13]

Arguably, the international law in action – actual state practice – is that states can and do treat their own environment in accordance with their own will and have a considerable degree of freedom to cause serious cross-border environmental damage. When states are acting in this way, the fail to discharge their duty to respect the environment of other states (and areas beyond).

Under international law, state sovereignty over the environment is not and should not be absolute. Nonetheless, states practice it this way. States use their sovereignty over the environment to achieve economic development. Economic development trumps the need to protect the global environmental quality on which all states depend upon to survive. The current regime is not sustainable.

We need to emphasize that states under the sovereignty-based system already have a duty to respect the environment outside their territories and areas of jurisdiction. Sovereignty does not mean that states can do whatever they want on their territories, but have to take into account the interests of other states.

Sovereignty inherently contains a duty to protect the environment of other states and beyond all states. I shall show that the factual and legal basis for this is further strengthened by the solidification of the duty of sustainable development.

Furthermore, the notion of carrying capacity and the principle of sustainable development provides a language by which to express the suggested paradigm.

In Chapter III, I shall elaborate on the notion of carrying capacity. Then, in Chapter IV, I shall provide a brief account of the development of the principle of sustainable development and then explain why I prefer the notion of environmental sustainability.

## III. The global environment and its carrying capacity

The global environment consists of four sub-systems.[14] 1) The atmosphere, which is the layer of gases surrounding our planet– including the air, 2), the hydrosphere, which is the combined mass of freshwater and saltwater found on, under, and above the surface of the earth, 3) The geosphere, which is the solid parts of the earth, i.e. the ground and the underground, 4) The biosphere. "Biosphere" is used in two contexts. It may refer to the areas on the planet where life can exist, as well as to the sum of ecosystems and living organisms on earth. NASA sums this up: "*Humans are of course part of the biosphere, and human activities have important impacts on all of Earth's systems*."[15]

[12] Sands and Peel, supra note 8, p. 207.

[13] Franz Xaver Perrez, "Cooperative Sovereignty: From Independence to Interdependence in the Structure of International Environmental Law", Kluwer Law International, 2000, p. 162.

[14] The National Academies of Sciences, Engineering, and Medicine, "For States by States", https://www.nextgenscience.org/pe/5-ess2-1-earths-systems (accessed 14 December 2019), The sub-systems approach is reflected in Article 3 No. 1 in the United Nations Framework Convention on Climate Change; "Climate system" means the totality of the atmosphere, hydrosphere, biosphere and geosphere and their interactions", Nicolai Nyland, "Er Stater Folkerettslig Forpliktet til å Beskytte Miljøet?", Unipub 2009, p. 10–15.

[15] See NASA: "Next Generation Science Standards: Core Ideas", https://pmm.nasa.gov/education/national-standards-descriptions (accessed 14 December 2019).

The global environment is borderless. In order to protect the global environment we must protect the air, water, soil/ground, and biosphere.

Complex interrelationships exist between the four subsystems.

Environmental interferences in one state affect ecosystems in other states. We have no exact knowledge of how these chain effects happen or what their consequences are. It is often times very difficult to gain a complete understanding of the cause and effect relationships between environmental intervention and environmental destruction. Environmental interventions are seemingly unproblematic and harmless viewed in isolation. In sum, however, they cause serious harm to the global environment. An obvious example is the aggregated global warming effects of the greenhouse gas emissions taking place within every state.

Humans are part of the global environment and interact with it. The destruction of one environmental element affects the environmental totality, and consequently humans, through chain reactions.

The balance and health of the complex global environmental system, is influenced by human interventions in the environment – interventions that are aimed to achieve development.

At the same time, the quality of the global environment is crucial for the possibility to achieve development. The possibility of humans to survive and their quality of life is dependent upon the quality of the environment and the quality of the human society.

Considering these facts, it is useful to introduce the concept of "carrying capacity." The concept is complex and its content is relative. Some definitions of it by ecologists are:

> "The maximal population size of a given species that an area can support without reducing its ability to support the same species in the future". "The maximum number of animals of a species that a habitat can support indefinitely … without degrading the resource base", and "For any given organism, there will be a maximum number of individuals that the environment can support without the environment being consequently degraded to the point where it can no longer support that number of individuals."[16]

Thus, the concepts of sustainable or sustainability relates to the capacity of the global environment to uphold human life on earth. Environmental degradation may ultimately threaten the survival of the human species.

The carrying capacity of the global environment limits what humankind can do with respect to the sum total of anthropogenic impact over time. Based on this, the global environment ultimately has a fixed carrying capacity.

Johan Rockström from the Stockholm Resilience Centre and Will Steffen from the Australian National University has introduced The Planetary Boundary concept:

> "Transgressing one or more planetary boundaries may be deleterious or even catastrophic due to the risk of crossing thresholds that will trigger non-linear, abrupt environmental change within continental-to planetary-scale systems."[17]

Based on this, sustainability only exists if the carrying capacity of the global environment is not

[16] Gretchen C. Daily and Paul R. Ehrlich "Population, Sustainability, and Earth's Carrying Capacity: A framework for estimating population sizes and lifestyles that could be sustained without undermining future generations" BioScience, November 1992, http://dieoff.com/page112.htm (accessed 13 December 2019).

[17] Rockström, Johan; et al. (2009), "Planetary Boundaries: Exploring the Safe Operating Space for Humanity", in Ecology and Society, https://www.ecologyandsociety.org/vol14/iss2/Art32/ (accessed 13 December 2019).

exceeded. There are known planetary boundaries – ecological limits.[18] If the threshold of carrying capacity is exceeded, a global ecologic collapse will take place. Ultimately, this may threaten the survival of mankind. A wealth of scientific data and knowledge support this.

If the current overexploitation of nature continues unabated, a global ecological collapse will take place. The question is not if, but when this will occur. The survival of peoples in states, states as a mass of peoples, and consequently international law itself, is at stake.

In 1989, the United Nations General Assembly (UNGA) was:

> "Deeply concerned by the continuing deterioration of the state of the environment and the serious degradation of the global life-support systems, as well as by trends that, if allowed to continue, could disrupt the global ecological balance, jeopardize the life-sustaining qualities of the Earth and lead to an ecological catastrophe, and recognizing that decisive, urgent and global action is vital to protecting the ecological balance of the Earth".[19]

This rings even more true today, 30 years after the statement.

There is a need to replace the traditional understanding of principle of state sovereignty over their environment, which has served as a legal basis for the environmental degradation. This observation by Christina Voigt is relevant:

> "These (ecological limits) defined on a planetary scale need to be broken down to state level as obligations under international law."[20]

My answer to this is that states should be obliged under international law to protect the sustainability of the global environment.

## IV. The emergence of and theory on the principle of sustainable development

This chapter addresses the development of the principle of sustainable development and then provides a brief explanation of why I prefer the notion of environmental sustainability.

Prior to the environmental awakening of the 1960s, it was assumed that the environment did not contain an absolute limit for development and economic growth.

The first expression of linking "carrying capacity" with the "needs of man" I have found is in the 1968 African Nature Convention. Its preamble provides that the utilization of all natural resources "*must aim at satisfying the needs of man according to the carrying capacity of the environment*".[21]

Through the introduction of the principle of sustainable development in 1987, the Brundtland Commission[22] or World Commission on Environment and Development (WCED) reframed this linkage:

> "Development that meets the needs of the present without compromising the abili-

[18] Jonas Ebbeson, "Planetary Boundaries and the Matching of International Treaty Regimes", Scandinavian Studies in Law, Vol. 59, p. 259–284.

[19] UNGA Resolution 44/228, 1989.

[20] Christina Voigt, "Environmentally Sustainable Development and Peace: What Role for International Law?", in "Promoting Peace Through International Law" Cecilia Marcela Bailliet and Kjetil Mujezinovic Larsen, Editors, p. 176, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2637833 (accessed 13 December 2019).

[21] https://www.jus.uio.no/english/services/library/treaties/06/6-01/african-conservation-nature.xml (accessed 13 December 2019).

[22] World Commission on Environment and Development, established by the UN General Assembly Resolution 38/161, 1983.

> ty of future generations to meet their own needs."[23]

The Commission's definition implies that the global environment, including humans living in it, is connected through space, time and quality of life.

An example of the spatial dimension is that air pollutants emitted in China have the potential to harm the quality of air in Europe. In addition, good clean air practices on one continent will probably affect global air quality positively.

The temporal dimension may be demonstrated by how the present generations are either benefitting or suffering from the choices of our grandparents and earlier ancestors. Their overfishing and logging practices have contributed to the loss of biodiversity experienced today. The economic choices we make today will affect the quality of life of our children and grandchildren. Our greenhouse gas emissions will more than probably reduce their quality of life.

The Commission also seems to see the concept of sustainable development as inherently intertwined with the concept of carrying capacity. Its definition presupposes that development over time has the ability to compromise the carrying capacity of the global environment. If development jeopardize the sustainability of those natural systems that support life on earth, the needs of the living and future generations will not be met.

Another interpretation of the definition, especially if the report of the Commission is read as a whole, is that it proposes human development of a kind that is able to sustain environmental quality. The Commission at least conceive this as a possible outcome.

My reading of the definition is that the Commission, through linking development with the concept of "*carrying capacity*", also envisages another possible outcome: If development continues unabated, the result may be that the global environment will be unable to sustain human life. Global environmental degradation could imply extinction of the human race.

The International Union for Conservation of Nature (IUCN) in 1991 held that the Brundtland Commission's definition focused too much on development. IUCN sought to seek a better balance between development and environmental protection and defined sustainable development as:

> "Improving the quality of human life while living within the carrying capacity of supporting ecosystems."[24]

The Australian government disagreed with WCED's definition too, and introduced the less anthropocentric concept of "ecologically sustainable development", arguably more in line with my suggested paradigm:

> "Development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends."[25]

On the other side of the scale, there were those who rejected the WCED concept entirely:

> "Sustainable development… ideas reflect ignorance of the history of resource exploitation and misunderstanding of the possibility of achieving scientific consensus concerning resources and the environment …

[23] The World Commission on Environment and Development, "Our Common Future", Oxford University Press 1987, p. 40.

[24] IUCN "Caring for the Earth – a Strategy for Sustainable Living", p. 10. https://portals.iucn.org/library/efiles/documents/cfe-003.pdf (accessed 13 December 2019).

[25] http://www.environment.gov.au/about-us/esd/publications/national-esd-strategy-part1#WIESD (accessed 13 December 2019).

> resources are inevitably overexploited, often to the point of collapse or extinction…even well-meaning attempts to exploit responsibly may lead to disastrous consequences… Distrust claims of sustainability."[26]

The first expression of the principle of sustainable development in an international agreement was in Principle 2 of the 1992 Rio Declaration on the Environment and Development. Principle 2 was the result of a compromise between developing and developed states. Many developing states felt that they had a right to development that trumped the need for environmental protection. They disagreed with the wording of Principle 2, which prima facie suggests that development and environmental protection are of equal importance.[27]

Staffan Westerlund maintained that subsequent to the Rio summit, the principle of sustainable development consisted of three elements, 1) ecological sustainability, 2) societal sustainability, and 3) economic sustainability.[28] Westerlund claimed that pillar 1), ecological sustainability, is absolute and a precondition for the other two elements.[14] Without ecological sustainability and the ability of the global environment to sustain life, societal sustainability and economic development cannot take place. Ecological sustainability establishes the necessary basis for and defines the limits for poverty eradication and economic development.

Furthermore, Westerlund stated that societal sustainability is a precondition for achieving economic development. The maximization of economic development of states is confined within the limits of ecological and societal sustainability. In his view, the principle of ecological sustainability constitutes the basis for and necessary precondition for sustainable societal development. Furthermore, both ecological sustainability and societal sustainability constitutes necessary conditions and a basis for economic development.

According to Michael Decleris states are absolutely obliged to achieve what he calls a "*qualitative development*".[29] He bases this on scientific knowledge about the carrying capacity and sustainability of the global environment.

Hans Christian Bugge[30], Secretary for the Brundtland Commission, holds that the principle of sustainable development contains an absolute and unconditional duty not to destroy those environmental resources that constitute the basis for the life and welfare of future generations.

Christina Voigt contends that the principle of sustainable development gives priority to the protection of fundamental life-sustaining natural processes. She views essential natural functions as supreme preconditions for economic development and international trade and human activity in general.[31]

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[26] Donald Ludwig, Ray Hilborn, Carl Walters "Uncertainty, Resource Exploitation, and Conservation: Lessons from History", Science. 2 April 1993 p. 17 and p. 36.

[27] Sarah Halpern, "United Nations Conference on Environment and Development: Process and documentation", Providence, Rhode Island: Academic Council for the United Nations System (ACUNS) 1992, and UNGA resolution A/60/1, "2005 World Summit Outcome."

[28] Staffan Westerlund, "Theory for Sustainable Development; Towards or Against?", in "Sustainable Development in International and National Law", Hans Christian Bugge, Christina Voigt, Editors, Europa Law publishing 2008, p. 47–66.

[29] Michael Decleris, "The law of Sustainable development – General Principles", a report to the European Commission in 2000, https://www.pik-potsdam.de/avec/peyresq2003/talks/0917/sillence/background_literature/sustlaw.pdf (accessed 13 December 2019).

[30] Hans Christian Bugge, "Our Common Future Reassessed", in "Sustainable Development in International and National Law", supra note 28, p. 1–21.

[31] Christina Voigt, "Sustainable Development as a Principle of International Law- Resolving Conflicts between Climate Measures and WTO Law", Martinus Nijhoff 2009, p. 387. (Her statements relates to trade disputes be-

Sands and Peel states that international law recognizes the principle of sustainable development, and that it contains "*the acceptance, on environmental protection grounds, of limits placed upon the use and exploitation of natural resources*."[32]

WCED's statements and subsequent legal theory reinforces a conclusion that the principle of sustainable development contains an absolute duty for states to protect the sustainability of the global resource base.

In addition, due to the scientific fact that the environment is global and borderless, I claim that states ought to have a duty to protect the environment within their territories in order to protect the global resource base. The principle of sustainable development may seem elusive. Nonetheless, it directly relates to the notion of a carrying capacity of the global environment. There must be something to sustain, and that which must be sustained, is an environment of a sufficient quality to uphold human life on earth.

It is possible to re-formulate the principle of sustainable development and call it the "Sustainability Principle". This emphasizes ecological sustainability as the basis for the elements of societal and economic sustainability. However, states and a vast amount of literature use the principle of sustainable development. In order to avoid confusion, it would probably be more prudent to use the familiar concept of sustainable development.

In spite of this, my opinion is that we need to emphasize the ecological sustainability element of the principle of sustainable development. The proposed paradigm – a duty for states to protect the sustainability of the global environment is arguably easier to understand intuitively than the concept of sustainable development. It also implies that the ecological component of sustainable development – or environmental sustainability – needs to trump the other two elements – economical and societal development. In addition, it captures that the global environment has a carrying capacity, and by that, implicitly express the scientific nature of the problem we are dealing with.

The question I raise is therefore whether states ought to be legally obliged to protect the sustainability of the global environmental system.

## V. Reframing sovereignty as a duty for states to protect the sustainability of the global environment

As I have shown, the principle that states have sovereignty over their environment rests on the premise that it is possible to draw a distinction between the environment on the inside, and that on the outside of states.

However, the fact that the global environment is borderless demonstrates that it is no longer possible to draw this distinction. The overexploitation and destruction of the environment in one state causes accumulated negative effects upon the environment of all other states, and thus on the global environment. When the sum of seemingly small interferences taking place within each state causes serious harm to the global environment, states no longer decide for themselves when they exercise sovereignty over their own environment.

Humans have dramatically altered the land surface, oceans, rivers, atmosphere, flora, and fauna of the earth. We live in the age of the Anthropocene, in which humans shape the global environment and vice versa.[33] Since Paul Crutzen and Eugene Stoermer coined this term in 2000, it

tween states, but I interpret them as reflecting her view on the general content of the principle of sustainable development).

[32] Sands and Peel, supra note 8, p. 229.

[33] Paul Crutzen and Eugene Stoermer, "Anthropocene," Global Change Newsletter, No. 41 2000, p. 17–18.

has served as a call to action for environmental sustainability and responsibility.

States not willing to protect their own environment in fact decide upon the quality of the environment of other states. Moreover, states that exercise their sovereign right to not consent to environmental treaties in order to avoid the resulting costs, free ride on the efforts of the signatories. States that decide to afford the environment with a strong legal protection fail because other states choose the opposite.

The premise on which traditional state sovereignty over the environment rests, that states only have a right to decide over their own, but not over the environments of other states, shatters.

Many legal scholars have pointed this out. Sands and Peel have stated that: "*The challenge for international law in the world of sovereign states remains to reconcile the fundamental independence of each state with the inherent and fundamental interdependence of the environment*"; Alexandre Kiss and Dinah Shelton emphasizes that "*the emergence of environmental protection as a common interest of humanity alters the traditional role of state sovereignty*."[34] Ved P. Nanda and George Pring have asserted that the traditional interpretation of "*sovereignty is a huge impediment to the success of international environmental law*."[35]

It is arguably necessary to reframe the legal relationship between state sovereignty and the environment.

Franz Xaver Perrez and Nico Schrijver also argues for a shift or reinterpretation of the principle of state sovereignty over the environment. They put the spotlight on the corollary obligations sovereignty entails. I shall go on to explain and then criticize the views of Perrez and Schrijver.

Perrez focuses on the duty for states to cooperate in order to solve global environmental problems.[36] Schrijver also focuses on the duties to protect the environment, but views this as corollary obligations flowing from the principle of PSNR.[37]

Perrez asserts that the no harm rule, the obligation to respect the environmental integrity of the other states, being an element of state sovereignty, falls short of responding to the reality and challenges of today's world. He contends that sovereignty understood as autonomy and independence has lost its relevance:

> "It becomes increasingly artificial and difficult if not impossible and dangerous to departmentalize the biosphere of humans into independent, autonomous and free nation states. Consequently, it seems that with the correction of the premises of sovereignty as independence will have to shift as well from independence towards an understanding which reflects more appropriately the existing interdependencies."[38]

His main conclusion is that a shift in the understanding of sovereignty has occurred already. Sovereignty today means a duty for states to cooperate in order to solve their problems, including the problem of global environmental degradation. His conclusion has a strong legal basis, cf. chapter 6 in his book, and it is not easily contestable. As he illustrates, nearly every international

[34] Sands and Peel, supra note 8, p. 206, Alexandre Kiss and Dinah Shelton, "International Environmental Law", 3rd Edition (Ardsley, New York: Transnational Publishers, 2004, p. 27.

[35] Ved P. Nanda and George Pring, "International Law & Policy for the 21st Century", Transnational Publishers, New York 2003, p. 18–19.

[36] Perrez, supra note 13, p. 136.

[37] Nico Schrijver, "Sovereignty over Natural Resources-Balancing Rights and Duties", in Cambridge Studies in International and Comparative Law, Cambridge University Press, 1997, p. 391–392.

[38] Perrez, supra note 13, p. 135–136.

environmental agreement affirm the principle of environmental cooperation.[39] A multitude of soft law instruments expresses it, and state practice reflects it.[40] It is arguably customary law.

I agree that a notion of sovereignty seen as a duty to cooperate is a step towards establishing a legal principle expressing the need for a stronger protection of the global environment.

However, the step is too short. It brings to the foreground that states may freely reject to cooperate in order to solve global environmental problems. The right to refuse to consent to environmental protection obligations is a key aspect of the traditional understanding of sovereignty. The failure by states to reach a clear agreement on reducing greenhouse gas emissions at the UN Climate conference in Madrid in December 2019 provides a recent illustration.

I propose a paradigm shift away from the traditional regime. We urgently need a clear and direct expression of an obligation for states to protect the sustainability of the global environment. My proposed expression points to this urgency. It begs the question "*is the sustainability of the global environment threatened*?"

Schrijver focuses on both the rights and duties flowing from the principle of PSNR.[41] He lists "*widely recognized*" rights for states under this principle including: 1) to possess, use and freely dispose of its natural resources, 2) to determine freely and control the prospecting, exploration, development, exploitation, use and marketing of natural resources, and 3) to manage and conserve natural resources pursuant to national developmental and environmental policies.

The increasing numbers of duties arising from the principle include: 1) the duty not to compromise the rights of future generations. 2) The duty to have due care for the environment, meaning first of all the duty to prevent significant harm to the environment of other states or of areas beyond national jurisdiction. 3) The duty to cooperate for international development, conservation and sustainable use of natural wealth and natural resources, 4) The duty of equitable sharing of transboundary natural resources, and 5) The duty to respect international law.

Schrijver further expounds on many of the tensions between these rights and duties and regard them as reflections of the limitations increasingly connected with the principle of state sovereignty.[42]

So far, he is in line with the suggested paradigm.

After reciting many of the familiar principles of international environmental, including due care for the environment, the precautionary principle, the principle of intergenerational equity and the duty to cooperate in cases of transboundary environmental problems, as well as the PSNR principle, he states:

> "Within this emerging international legal framework, national sovereignty over natural resources, as an important cornerstone of environmental rights and duties, may well continue serve as a basic principle."[43]

In Chapter 10 in his book: "*Sovereignty over natural resources as a basis for sustainable development*", he discusses the relationship between PSNR and sustainable development under the heading "*Permanent sovereignty as a corner-stone of international sustainable development law*". He creates the impression that the principle of PSNR contain

[39] See the 1982 United Nations Convention on the Law of the Sea Art 123 and 197, 1991 Alpine Convention Article 2(1), 1985 Vienna Convention on the Protection of the Ozone Layer Article 2(2) and the1992 Convention on Biological Diversity, Article 5.

[40] Sands and Peel, supra note 8, p. 213.

[41] Schrijver, supra note 37, p. 391–392.

[42] Schrijver, supra note 37, Part III Chapter 11.

[43] Schrijver, supra note 37, p. 250.

both environmental and developmental objectives.

By doing this Perrez seems to fuse, or identify PSNR and sustainable development:

> "Permanent sovereignty is a key principle of both international economic law and international environmental law. As such it can play an important role in the blending of these two fields of law with the aim of promoting sustainable development."[44]

In my opinion, PSNR reflects the flawed traditional interpretation, – state sovereignty over the environment and the corollary right to exploit natural resources in order to achieve "*development*". "*Sustainable*" and "*sustainability*" often pulls in a different direction than development.

Schrijver wants to "*promote sustainable development*" by way of PSNR. I cannot see that he adds anything new to international law when he considers that PSNR is the "*corner-stone*" or basic principle, and identifies this with sustainable development.

In my opinion, Schrijver's view will uphold the current regime, where sovereignty over the exploitation of the environment takes precedence over environmental protection.

My position is that the present legal regime is unsustainable. The premise on which traditional state sovereignty over the environment rests, that states only have a right to decide over their own, but not over the environments of other states, has shattered. We need to reframe the legal relationship between states and the environment in order to encapsulate the problem of global environmental destruction.[45]

In the words of Malcolm Shaw: to survive, international law "*must be in harmony with the realities of the age*".[46] Notions of sovereignty demands cautious rethinking, as Thomas Franck puts it.[47]

As stated, the suggested duty for states to protect the sustainability of the global environmental system would entail the precedence of environmental protection over economic development. This new way of expressing the relationship between the state and the environment is arguably better suited to address the problem of global environmental destruction than the traditional right to exploit nature within "our own state" – PSNR approach. The paradigm better reflects the scientific fact that the environment is borderless.

## VI. The suggested paradigm may find support by a progressive interpretation of treaty law and customary law

### a) Introduction

Treaties, custom, and general principles of law recognized by states constitute bases for international law, cf. Article 38 (1) a), b) and (c) in the Statute of the International Court of Justice. When deciding whether states have a duty to do something, this duty must flow from one of the recognized sources. Consequently, a duty for states to protect the sustainability of the global environment must be based on treaty or custom, or be recognized as a general principle of international law.

The proposed paradigm does not find direct support in these sources. In this Chapter, I shall discuss whether the paradigm can find support by an untraditional interpretation of them.

[44] Schrijver, supra note 37, p. 394.
[45] Nyland, supra note 14, p. 141–150.
[46] Malcolm Shaw, "International law", Cambridge University Press, 8th Edition, p. 32.
[47] Thomas Franck, "Fairness in International Law and Institutions", Oxford University Press, 2002, p. 3–4.

**b) No treaty expressly oblige states to protect the sustainability of the global environmental system – the proposed paradigm must be established through induction from treaties**

No treaty expressly oblige states to protect the sustainability of the global environmental system.

However, it is possible to view the substantial mass of specific obligations states have accepted in a large number of environmental treaties as in sum being an expression of a general principle, requiring states to protect the sustainability of the global environmental system. Some examples are:

The Convention on Biological Diversity, United Nations Convention on the Law of the Sea and other treaties on the protection of oceans. The United Nations Framework Convention on Climate Change and its Kyoto Protocol and Paris agreement. The 1985 Vienna Convention on the Protection of the Ozone Layer. Treaties on freshwater use such as the UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes. The Air Pollution Convention, Rotterdam Convention establishing a prior Consent procedure for Certain Chemicals and Pesticides in International Trade, the Stockholm Convention on Persistent Organic Compounds, the Minamata Convention on Mercury, the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, and the United Nations Convention to Combat Desertification UNCCD.

Taken together, these treaties reflect a broad duty for states to protect their own environment, and consequently, the global environmental system. In sum, the mass of environmental treaties places broad and sweeping duties on states, to a considerable degree limiting their freedom to treat their environment as they see fit.

Brownlie/Crawford underscores this: "*States increasingly have duties not just in respect of transboundary harm or the global environment, but also in respect of conserving their own environment*," and points to the Biodiversity Convention preamble and Articles 6 and 8 to illustrate it.[48]

As I showed in III above, the global environmental system consists of four elements: The atmosphere, hydrosphere, geosphere, and biosphere. The treaties listed above aim to protect all four elements. Due to the fact that states in various degrees are obliged to protect all four elements it may be argued that states already are obliged to protect the sustainability of the global environmental system.

I derive the new and general paradigm from the multitude of specific instances of environmental protection in treaties. The new paradigm is my construction. States have not consented to it. The duty for states to protect the sustainability of the global environment is my opinion of what the law ought to be.

**c) The proposed paradigm is not customary law, but may be established through deduction from the customary principle of sovereignty as a duty to protect the environment of other states**

As I have shown Principle 21 of the Stockholm Declaration, Principle 2 of the Rio Convention, and Article 3 of the Convention on Biological Diversity all reflect the principle of PSNR and the no-harm rule, which is the duty for states to protect the environmental integrity – sovereignty of the other states.

Even though states are considered to have a duty to protect the environmental sovereignty of the other states, states practice a right to exploit natural resources and treat the environment within their jurisdiction as they see fit. They en-

[48] Brownlie/Crawford, supra note 2, p. 350 and 431.

joy sovereignty over their environment – PSNR- as a broad freedom. The ongoing degradation of the environment documents that too few states practice a strict no harm rule. Nonetheless, the no harm rule is binding, cf. Chapter II. Therefore, it is of relevance for my discussion.

The problem now is whether we can derive the proposed paradigm from the no harm rule through a progressive interpretation of it.

The expressions of the no harm rule in the Principles and Article is certainly broad enough. If states have a duty "*to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction*", they may arguably have a duty to protect the sustainability of the global environment.

Furthermore, in light of scientific knowledge, states must conceivably protect their own environment in order to fulfill their obligation not to cause significant harm to the environment of other states and beyond.

In spite of this, we cannot view the no harm rule in isolation. It is an integral part of Principles 2 and 21, and Article 3, and they give rise to complicated questions of interpretation. The wording of the Principles and Article suggests that there is no absolute sovereignty for states over their environment. It reflects the need to strike a balance between the right of PSNR and the duty of no harm to the environment of other states. It is obvious that the two norms can pull in different directions. In addition, the Principles and Article imply a responsibility for states to cooperate in order to solve global environmental problems. Moreover, the application of the no harm rule is subject to strict conditions. As set out in the Trail Smelter case, the environmental harm must result from human activity, it must cross national boundaries, and it must be significant or substantial.

The relevancy of the no harm rule is debatable.

It is inextricably linked with the traditional notion of environmental sovereignty.[49] It also embodies the outdated dichotomy of the environment within and that outside of the states. There are also still many unanswered questions about its application in real cases.[50] The mere mentioning of the rule attracts all these difficulties.

Notwithstanding this, it is possible to present a weak claim that states have a duty to protect the sustainability of the global environment based on the no harm rule.

It is perhaps more worthwhile to invoke the general principles laid out in the Corfu Channel Case and the Island of Palmas Case as support for the paradigm.

In the Corfu Channel Case, the ICJ set out that the principle of sovereignty contains "*the obligation of every state not to allow its territory to be used for acts contrary to the acts of other states*."[51] According to Sands and Peel the principle of good neighborliness, "*underlies the dicta of the ICJ*" in the Corfu Channel case as well as the no harm rule laid out in the Trail Smelter case.[52]

States cannot but know that the activities on their territories contribute to cause global environmental degradation of a scale that threatens the carrying capacity of the global resource base. Consequently, they ought to have a duty to treat the environment in a way that protects the sustainability of the global environment. If states treat their environment to the detriment of all states, they are in breach of the foundational principle of good neighborliness. If we take this

[49] Perrez, supra note 13, p. 162.
[50] Nanda and Pring, supra note 35, p. 22, Sands and Peel, supra note 8, p. 206.
[51] Corfu Channel Case, ICJ Reports 1949, p. 22.
[52] Sands and Peel, supra note 8, p. 207.

path, we go straight to the foundation principle and avoid the problematic no harm rule.

In the Island of Palmas case, the court established that "*Territorial sovereignty… has as corollary a duty: the obligation to protect within the territory the rights of other States*."[53] In accordance with this, states have a stake in how the other states treat their own environment.

The expressions of the duty side of the principle of sovereignty in the two cases presents a potential legal basis for the paradigm.

The third relevant case is the advisory opinion in the Namibia case where the ICJ stated that the possession of rights involves the performance of corresponding obligations.[54] Reasoning by analogy: the state's possession of sovereignty over the environment involves the performance of a corresponding duty to protect the sustainability of the global environment.

The ICJ derive the principles from the broader principle of sovereignty. Because the principle of sovereignty is grounded in customary law, principles inferred from it should have the same status.[55]

If the proposed paradigm is established based on the principles relied on in these cases, it must have customary law status.

I shall go on to analyze whether the proposed duty may be a "principle of law recognized by civilized nations", cf. Article 38 (1) (c).[56]

## VII. The proposed duty for states to protect the sustainability of the global environment as a potential general principle of international law cf. Article 38 (1) (c) in the ICJ statute

### a) Introduction

Positivistic traditionalists like Tunkin and Guggenheim downplay the role of general principles in the formation of international norms.[57] Even more extreme positivists reject that general principles is a valid source of international law and see general principles as a "*sub heading under treaty and customary law incapable of adding anything new to international law unless it reflects the consent of states*".[58]

I presuppose that general principles to which Article 38(1) (c) refers is a valid source of international norms.

However, the meaning of general principles of law is ambiguous and controversial. This source may include:

1. Legal principles that are common to many systems of national law,
2. General principles of international law, including general principles of international environmental law,
3. As incorporating principles of natural law in international law, and
4. Principles accepted for so long and so generally that they no longer have a direct connection to state practice.[59]

I argue that all these four understandings may serve as a basis for a duty for states to protect the sustainability of the global environment.

I shall proceed with a brief analysis to explain this.

[53] Island of Palmas Case, 2 RIAA 1949, p. 829–90.
[54] Legal Consequences for States of the Continued Presence of South Africa in Namibia, ICJ Reports 1971, p. 16.
[55] Louis Henkin, "International Law: Politics and Values", Dordrecth 1995, p. 8–12.
[56] Sometimes referred to as "general principles".
[57] Nyland, supra note 14, p. 65.
[58] Shaw, supra note 46, p. 73.
[59] Nyland, supra note 14, p. 55–79, and Brownlie/Crawford, supra note 2, p. 31–34.

**b) National law analogies support the creation of the proposed new paradigm**

Based on understanding 1) above, we can draw international law rules from municipal law analogies.[60]

A great number of states have established domestic rules and or principles affording the environment with protection. A large number have done this in their constitutions, others have done so by way of ordinary legislation or regulations. In some states, the citizens have a human right to the environment and the state a corresponding duty to respect that. Other states have established broad ranging duties to provide for sustainable development. Arguably, all these rules reflect a broader duty of environmental protection.

Jörg Lücke takes an expansive view. He asserts that the obligation to protect the environment is a general principle of law. This because the constitutions of all states explicitly or implicitly accept an obligation to protect the environment.[61]

States ought to be obliged to follow the same principle on the international plane as they are domestically. When states are bound to a principle nationally it is inconsistent if they are not bound by it vis-à-vis the other states.

Based on this understanding, we may draw the analogy that states as a general principle of international law have a duty to protect the global environment.

It is possible to express this as a duty for states to protect the sustainability of the global environment.

I shall go on to examine whether the proposed paradigm can find a basis in general principles of international environmental law, being general principles of international law, cf. understanding 2).

**c) General principles of international law cf. Article 38 (1) (c) supports the proposed new paradigm**

First, I shall provide an overview of some of the representative views concerning the basis for principles of international environmental law. Then I shall explain how these principles as set out by the jurists may strengthen the legal basis for the paradigm I propose.

Christina Voigt rejects that "*general principles of law recognized by civilized nations*" may only be derived from municipal law analogies. She includes "*general principles of international environmental law*" in the source in Article 38 (1) (c).[62] Kiss and Shelton seem to agree.[63]

Patricia Birnie and Alan Boyle seems to have a different approach and do not include principles of international environmental law in Article 38 (1) (c).[64]

They are more in line with Sands and Peel, who state that "*general principles and rules of international environmental law are reflected in a multitude of internationally relevant sources and instruments*: "*treaties, binding acts of international organizations, state practice (customary international law), judicial decisions, and soft law commitments… From the large body of international agreements and other acts, it is possible to discern general rules and principles that have broad, if not necessarily universal, support and are frequently endorsed in practice*."[65]

[60] Perrez, supra note 13, p. 280–283, Nanda and Pring, supra note 35, p. 12.

[61] Jörg Lücke, "Universales Verfassungsrecht, Völkerrecht und Schutz der Umwelt", 35 Archiv des Völkerrechts 1997 p. 1–28.

[62] Voigt, supra note 31, p. 154–160.

[63] Alexandre Kiss and Dinah Shelton, supra note 34, p. 43.

[64] Patricia Birnie and Alan Boyle, "International Law &the Environment", Oxford University Press 3rd Edition 2009, Chapter 3.

[65] Sands and Peel, supra note 8, p. 197–198.

Sands and Peel elaborates on this.[66] They see PSNR and the no-harm rule as reflected in Principle 21 in the Stockholm Declaration as obligations – "*rules*" based in customary international law (on page 202). When discussing the "Preventive Action" principle they refer to the Pulp Mills case, where the ICJ established that "*the principle of prevention, as a customary rule, has its origins in the due diligence that is required of a state in its territory*".[67] They do not reach the same firm conclusion as the ICJ, but imply (on page 212) that there is compelling evidence of "*state practice*" (being one of the requirements for establishing customary rules).

Sands and Peel goes on to state (on page 216) that the Principle of international environmental Cooperation contains certain "*commitments*" or "*obligations*." On page 198, they consider that "*the prevention and cooperation Principles are sufficiently well established … to reflect an international customary legal obligation the violation of which would give rise to a free standing legal remedy*."

They contend (on page 229), that "*international law recognizes a Principle (or Concept)*" of "Sustainable Development." It is an "*overarching principle requiring states to reconcile economic development with protection of the environment*" (page 197). They recognize that the principle consists of four main elements: (on page 229). They are: 1) the need to take into consideration the needs of present and future generations. 2) The acceptance, on environmental protection grounds, of limits placed upon the use and exploitation of natural resources. 3) The role of equitable principles in the allocation of rights and obligations. 4) The need to integrate all aspects of environment and development, and 5): The need to interpret and apply rules of international law in an integrated and systemic manner.

Of these, they view the fourth element, the need to integrate all aspects of environment and development, as set out in Principle 4 of the Rio Declaration as "*the most important and the most legalistic*" (on page 227). Rio Principle 4 states that "*In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it*."

Moreover, they stress that the Precautionary Principle "*continues to evolve*". At the same time, they emphasize that "*this principle as it is elaborated in Principle 15 in the Rio Declaration and various international convention, has now received sufficiently broad to allow a strong argument to be made that it reflects a principle of customary law*" (page 239).

My understanding is that they consider that the principles of Polluter Pays and Common but Differential Responsibility have a more unclear legal status, because they are vague as well as controversial, (p. 240–248).

Perrez identifies four general principles of international environmental law that have "*vast international support*" in various instruments, but does not include them in Article 38 (1) (c). They are the Principle of sustainability, the Precautionary principle, the Principle of common heritage of mankind, and the Principle of Common but Differentiated Responsibility."[68]

According to Nicholas de Sadeleer, the three foremost environmental principles are those of Polluter Pays, Prevention of Environmental Damage, and Precaution in order to Counter Environmental Damage.[69]

I see the principles of international environmental law and general international law as laid

[66] The following page references are all to Sands and Peel, supra note 8.

[67] Pulp Mills case, ICJ Reports 2010, p. 14.

[68] Perrez, supra note 13, p. 283.

[69] Nicholas De Sadeleer, "Environmental Principles. From Political Slogans to Legal Rules", Oxford University Press 2002, p. 2, 21, 61, and 91.

down by all the jurists above as expressions of a more basic duty under international law, which is the duty for states to protect the sustainability of the global environment.

Furthermore, I agree with Voigt, Kiss and Shelton in that Article 38 (1) (c) directly includes general principles of international environmental law as "general principles of law recognized by civilized nations."

Voigt claims that sustainable development is a binding "*general principle and part and parcel of general international law*."[70] She also sets out that "*the principle of sustainable development needs first and foremost to be understood as giving priority to the protection of fundamental life-sustaining natural processes*."[71]

Her position implies that one of the most important principles of international law is the paradigm I propose.

Kiss and Shelton asserts that:

> "The need to protect the entire biosphere implies that international rules should safeguard the environment within states, even when harmful activities produce no obvious detrimental effects outside the acting state. It also must guarantee protection to areas that are outside territorial control … Underlying this duty are general legal concepts that express the major characteristics of international environmental law."

They go on to stipulate that "*the concepts on which international environmental law is based*" are Sustainable Development, The Common Heritage of Mankind, Common Concern of Humanity, Rights of Future Generations, and Common but Differentiated Responsibility. Furthermore, they see State sovereignty, Cooperation, The obligation to Preserve and Protect the Environment, Prevention of Environmental Harm, Precaution, and the Polluter Pays principle as "*general legal principles*".[72] The general principles they mention underlie the "*need to protect the entire biosphere*." The consequence of this "*need*" is "*the duty*" to "*protect the entire biosphere*," obliging states to "*safeguard*" their own environment and the environment outside their territories and jurisdictional spheres.

Kiss and Shelton reinforce the support for paradigm I propose: the "*needed*" … "*duty*" for states "*to protect the entire biosphere*". (This regardless of the fact that I am a bit confused as to whether they consider this as a duty lex ferenda or lex lata, cf. "*the need*" versus "*rules should safeguard*".)

Kiss and Shelton also support the scope of the proposed duty for states to protect the sustainability of the global environment. It would oblige states to protect the environment outside as well as that on the inside of their territory and spheres of jurisdiction even when in-state interference in the environment produce no clear or obvious detrimental effects outside their environment in particular instances.

When Sands and Peel distinguishes the Principle of Preventive Action from the traditional sovereignty based Rio Principle 2 and Principle 21 in the Stockholm Declaration they set out that: "*Under the Preventive Principle, a state may be under an obligation to prevent not only transboundary harm, but also damage to the environment within its own jurisdiction*."[73] The consequence of their opinion is that states are obliged to protect the global environment: i.e. the environment outside, as evinced by their reference to the principles, and within their jurisdiction, as reflected in their statement about the content of the preventive action principle.

[70] Voigt, supra note 31, p. 260.
[71] Voigt, supra note 31, p. 380.
[72] Kiss and Shelton, supra note 34, p. 247, and p. 248–268.
[73] Sands and Peel, supra note 8, p. 212.

To conclude: general principles of international environmental law cf. Art 38 (1) (c) may serve as a basis for the proposed paradigm.

I shall go on to examine whether natural law can provide support for it.

**d) States may be obliged to protect the sustainability of the global environment under natural law**

A.V. Verdross takes a progressive stance and contends that the source general principles in the ICJ statute Article 38 (1) (c) include natural law principles. He argues that it has the effect of incorporating natural law in international law.[74]

I shall not partake in the debate whether or not natural law is a source of international law. My aim is to express what may follow when we take a progressive approach to the formation of new international norms, and include natural law as a source of legal obligations for states.

I therefore presuppose that natural law principles provides a reservoir for new norms of international law, as envisaged by Verdross, cf. understanding 3) above.

Natural law is not deduced from conscious human decisions on what the law is. It is not positivistic. It does not flow from state consent by way of negotiated treaties or state practice reflecting customary international law, cf. Article 38 (1), (a) and (b). Natural law is eternal and lay down universally binding legal principles.[75]

The laws of nature is arguably a part of natural law, and thus included in Article 38 (1) (c). As the WCED stated in 1987 "*Human laws must be reformulated to keep human activities in harmony with the unchanging and universal laws of nature*". This has never been more relevant and urgent than it is today.

Klaus Bosselmann states that "*environmental law has its roots in natural law*" and claims that "*environmental protection is justified as a manner of scientific proof*."[76]

New norms of international law can be grounded in what science reveals about the nature of environmental degradation. When science tells us that the carrying capacity of the global environment is threatened and that we are approaching a finite limit to growth, what we need is new international law. My proposed paradigm: that states ought to be obliged to protect the sustainability of the global environmental system provides this.

Furthermore, certain rights and responsibilities are inherent in human nature, and may be understood through simple reasoning.[77] Thus, human rights are grounded in natural law traditions.[78]

Many legal scholars have argued for the existence of a human right to environmental protection. In his separate opinion in the ICJ case of the Gabčikovo-Nagymaros project, judge Weeramantry held that:

> "The protection of the environment is likewise a vital part of contemporary human rights doctrine, for it is a sine qua non for numerous human rights such as the right to health and the right to life itself. It is scarcely necessary to elaborate on this, as damage to the environment can impair and undermine all the human rights spoken of in the Uni-

[74] A.V. Verdross "Les Principes Genéréaux du Droit Dans La Jurisprudence Internationale", RdC, Vol. (1935-II), p. 191–251.
[75] Nyland, supra note 14, p. 24–29.
[76] Klaus Bosselmann, "Grounding the Rule of Law", in "Sustainable Development in International and National Law", supra note 28, p. 84.
[77] https://legaldictionary.net/natural-law/ (accessed 13 December 2019).
[78] Henkin, supra note 55, p. 180.

versal Declaration and other human rights instruments."[79]

Sands and Peel recognize that "*some non-binding and widely accepted declarations supporting the individual's right to a clean environment have been adopted*."[80]

However, states have not consented to a treaty establishing a general human right to environmental protection, and it is not established customary law. Nonetheless, a human right to environment may be derived from other, more established human rights, as judge Weeramantry asserts.

The human right to life is the most basic human right.[81] It is also the basis for all other human rights. No law exist if life ceases to exist. Natural law is the legal basis for the "inalienable" right to life, which is inherent in human nature. Thus, states have a corresponding duty to protect human life.

The right to life is reflected in Article 3 of the Universal Declaration of Human Rights, Article 6 of the International Covenant on Civil and Political Rights, and Article 6 of the Convention on the Rights of the Child. These universal standards must be interpreted within the context of other United Nations instruments, enumerated in the sixth preamble paragraph of Commission resolution 1992/72.[82] These instruments all reflect natural law. There are also regional conventions protecting the right to life: Art 2 in the European Convention on Human Rights, and Article 4 in the African Charter on human and people's rights.

It is a scientific fact that the environment must be of a sustainable quality to be able to uphold life on earth.

Consequently, states ought to have a duty to protect the sustainability of the global environment in order to fulfill their natural law obligation to protect human life.

That natural law plays a role in international law is also reflected in Article 51 of the UN Charter, under which states in a treaty have consented to an "*inherent right*" to use military force if they are subject to an armed attack. The right to protect and ensure the continued existence of the sovereign state is an essential or characteristic attribute of the state as a subject of international law. It is "*inherent*" in international law and predates positive law. The French version of Art 51 makes an even sharper reference to natural law: it refers to the "*droit naturel de légitime défense*". The purpose of the inherent or natural law right is to protect the continued existence of the sovereign state under attack.

Thus, the right to self-defense is the expression of a more general and underlying principle of natural law, which affords states a right of self-preservation, or right to survive.[83] The right of state survival exists as an essential or characteristic attribute of the state as a subject of international law.

In the Nuclear Weapons Advisory Opinion, judge Weeramantry points to "*the efforts in recent times to formulate what have been described as 'principles of ecological security' – a process of norm creation and codification of environmental law which has developed under the stress of the need to protect human civilization from the threat of self-destruction*."

[79] Case concerning the Gabčikovo-Nagymaros Project, ICJ Reports 1996, Separate Opinion of Vice-President Weeramantry, p. 88.

[80] Sands and Peel, supra note 8. p. 815.

[81] Henry J. Steiner and Philip Alston, "International Human Rights in Context: Law, Politics, Morals: Text and Materials", Oxford University Press, 2 Edition 2000, p. 47–48.

[82] UN High Commissioner of Human Rights, https://www.ohchr.org/EN/Issues/Executions/Pages/InternationalStandards.aspx (accessed 13 December 2019).

[83] Bin Cheng, "General Principles of Law as Applied by International Courts and Tribunals", Cambridge University Press 2006, p. 29–102.

He emphasizes that, "*these principles of ecological security… do not depend for their validity on treaty provisions. They are part of customary international law. They are part of the sine qua non for human survival*."[84]

As we can see, he links principles of environmental law with the survival of humans and states –"*human civilization*". He asserts that "*ecological security" is a part of the sine qua non for human survival*". Consequently, states ought to have a duty to protect the sustainability of the global environment in order to fulfill their customary, and in my reading of his reasoning, a natural law obligation to protect the survival of states.

If states have a customary and natural law right to survive, other states must be obliged to protect the sustainability of the global environment. Unless they do so, all states will cease to exist. Natural law support the proposed paradigm.

I shall go on to examine whether the new paradigm can find support in the principle of necessity.

**e) The principle of necessity supports the proposed paradigm**

The source "general principles of law recognized by civilized states" in Article 38 (1) (c) might refer to principles that have been accepted for so long and so generally as no longer to be directly connected to state practice, cf. understanding, cf. understanding 4) above.[85] The principle of necessity is arguably one of these. I do not see necessity as a possible defense by states in order to escape responsibility for internationally wrongful acts as established in Article 25 of the International Law Commissions Draft Articles on State Responsibility.[86]

I see necessity as the result of a balancing of interests. The principle of necessity dictates that the lesser interest must give way to the larger interest. It is possible to view the lesser interest as the sovereign right for states to treat the environment in accordance with their own free will, and the larger interest as the need to establish a new duty for states to protect the global environment. State sovereignty over their environment must give way to the acute need to protect the integrity of the global environment.

An increasing number of scientific consensus reports document that global environmental destruction is so serious that it approaches a general state of emergency. Increasing global warming, overexploitation and the pollution of freshwater resources, destruction of biological diversity, emissions of toxic chemicals, and air pollution, all threaten the ability of the global environment to sustain life.

The territories of the small island states in the Pacific are increasingly being flooded due to rising sea levels probably caused by global warming. Creating what many call climate refugees. The territory upon which Inuit live is melting. The areas where they have roamed for countless years disappear. The territories of peoples and of states disappear.

Thus, it may be argued that the lesser interest, which is the sovereign right for states to prioritize development and decide over the quality of the environment within their spheres of jurisdiction, must give way to the larger interest, which is to prevent a global ecological collapse.

When "*necessity*" dictates what the law should be, new norms can be established instant-

[84] Legality of the Threat or Use of Nuclear Weapons Advisory Opinion, ICJ Reports 1996, p. 503.

[85] Bin Cheng, supra note 83, "General Principles of Law as Applied by International Courts and Tribunals", Cambridge University Press 2006, p. 29–102.

[86] Report of the International Law Commission on the work of its Fifty-third session, Official Records of the General Assembly, Fifty-sixth session, Supplement No. 10, A/56/10, chapter IV.E.2.

ly. The scientific consensus reports provide solid evidence for the existence of a global state of environmental emergency.

Law of necessity – "*necessary law*" dictate that states must protect their own environment – the areas where they exercise jurisdiction or control – in order to stop the destruction of the global environment.

Human beings and sovereign states have a right to survive. International law should surely not be a self-destructive legal system.

We may deduce from the principle of necessity the proposed duty for states to protect the sustainability of the global environmental system.

**f) Summary**

In b)–e) above I have shown that the proposed paradigm may be seen as a "*general principle of law*" cf. Article 38(1)(c), based on national law analogies, general principles of international environmental law, natural law, and the principle of necessity.

It must be stressed that there is considerable disagreement as to whether Article 38 (1) (c) is a relevant source of international norms, and the content of it, if it is seen as a valid source.

Nonetheless, I consider Article 38 (1) (c) a valid source and that General Principles can provide a means for developing new norms of international law that are urgently needed, or "*responsive to today's problems*."[87] There is an urgent need to establish a duty for states to protect the sustainability of the global environment.

The proposed paradigm establishing a duty for states to protect the global environment could serve many functions. I shall only briefly point out some of these.

As I shall show in VIII below, it could serve as a basis for a duty for states to protect a minimum of environmental quality.

In IX. I shall provide a short explanation of how the proposed paradigm may: serve as a basis for new evidentiary rules in environmental cases, that it can bring about a new approach to international law-making, and involve a new approach with respect to the interpretation of existing norms of international law.

## VIII. A duty for states to protect the sustainability of the global environmental system would entail a duty to protect a minimum of environmental quality

The paradigm presupposes that how states treat their environment is not any longer an internal affair, but in the interest of all states. A duty for states to protect the sustainability of the global environment would prohibit states from exercising a sovereign right to prioritize development before environmental protection within their territories. It would entail an absolute duty for states to uphold the carrying capacity of the global environment.

A new and sustainability based international law would take as point of departure that the global environmental destruction does not respect the borders and jurisdictions to which state sovereignty is attached. It would also take into account the fact that the environmental disturbances of today affect the environmental quality of generations unborn.

## IX. A duty for states to protect the sustainability of the global environmental system could serve as the basis for new evidentiary rules and a new legal methodology

**a) Introduction**

Under the traditional method of international law, the sovereignty principle determines how facts are established through rules on burden of

[87] Voigt, supra note 31, p. 155.

proof, how new obligations are created, and how existing sources are interpreted.[88]

The Permanent Court of International Justice formulated the essence of this in the Lotus case: "*Restrictions upon the independence of States cannot be presumed*."[89]

I will show that a duty for states to protect the sustainability of the global environmental system could serve as a basis for a new approach.

**b) New rules on burden of proof**

The Trail Smelter case established the traditional rules on the burden of proof for state responsibility based on violations of the no harm rule. The International Law Commission have endorsed them.[90] The Tribunal stated that:

> "… No State has the right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another or the properties or persons therein, when the case is of serious consequence and the injury is established by clear and convincing evidence."[91]

The state claiming a violation of the no harm rule must provide "*clear and convincing evidence*" of damage to its environment resulting from a specific detrimental activity on the territory of the alleged responsible state.

This strict burden of proof will usually play out in the favor of the sovereign freedom of states to exploit their own environment, to the detriment of environmental protection.

Furthermore, as stated, the traditional international law does not take into account that the global environmental destruction is the sum of seemingly harmless environmental interferences taking place within each state. For example, the individual state will not experience acute and clear environmental damages because of its own greenhouse gas emissions. However, over time, it is nearly certain that global warming, being the sum of greenhouse gas emissions of all states, will cause irreversible harm to the global environment, bringing it into a permanent imbalance.

A new and sustainability based international law must therefore build in mechanisms to deal with the problem of sum-effects. It could serve as a vehicle for replacing the old and outdated Trail Smelter rules on causation and proof.

Environmental considerations ought to trump economic development. We know with a high degree of certainty that continued population growth, and continued exploitation of nature, over time will lead to a global environmental collapse. However, we do not know when that will happen, and we have incomplete knowledge about the complex interactions and mutual interdependencies between humans and the environment.

The lack of knowledge and the potentially catastrophic effects of environmental destruction call for a strong precautionary approach.

In the absence of scientific consensus that an action or policy has a suspected risk of causing serious harm to the environment, the burden of proving that it is not seriously harmful ought to be placed on those taking an action, those interfering with the environment, contrary to the Trail Smelter approach.[92]

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[88] Nyland, supra note 14, Chapters 2 and 10.

[89] Lotus Case P.C.I.J. Reports 1927, Series A, No. 10, p. 18.

[90] Cf. its commentary to the Draft Articles on the Prevention of Transboundary Harm from Hazardous Activities, in the Text adopted by the International Law Commission at its fifty-third session in 2001, submitted to the General Assembly, A/56/10.

[91] Trail Smelter Arbitration, 35 AJIL (1941) p. 716. See Sands and Peel, supra note 8, p. 206–207, and Chapter 16 "Liability for Environmental Damage".

[92] Martijn van der Kerkhof, "The Trail Smelter Case Re-examined: Examining the Development of National Procedural Mechanisms to Resolve a Trail Smelter Type Dispute", Merkourios, volume 27, 2011, issue 73, p. 68–83, https://dspace.library.uu.nl/handle/1874/208558

When it is reasonably uncertain whether a specific environmental interference has the potential to cause substantial environmental damage, the benefit of the doubt ought to be given to the environment.[93]

Sands and Peel posits that the principle of precaution "*already has been relied upon … to require a shift in the burden of proof in cases concerning the conduct of certain especially hazardous activities*."[94] As we can see, they limit the scope of the shift to especially hazardous activities. In my opinion, we need to shift the burden of proof more generally, to take into account the detrimental sum-effects of apparently insignificant environmental interferences taken within each state.

**c) A new approach to international law-making**

The sovereignty principle also controls the creation of new international norms. As mentioned, the traditional understanding of the sovereignty principle is that states are not subject to the will of others. "*Restrictions upon the independence of the other states cannot be presumed*". In accordance with Article 38 (1) (a) and (b) in the Statute of the International Court of Justice, states must freely consent to restrictions in their environmental sovereignty. Explicitly by way of treaty, or implicitly, by way of custom (and even more implicitly, by way of a general principle of law).

States use the right to not consent as a bargaining chip in the negotiations of treaty obligations. Sovereignty is the reason why states often fail to reach binding agreements on environmental protection. This leaves certain elements of the environment unprotected. The result is a fragmented legal regime. "*The slowest camel sets the pace*".

The formation of new customary law takes a long time. There are examples of "instant customary international law", but they are very far apart. The basic tenet of space law, that no one state may claim ownership of outer space or any celestial body, is the only example I know of.[95] The requirement that customary international law must be based on widespread and representative practice, allows for states to object to the formation of necessary restrictions in the right to sovereignty over their environment.

Article 38 (1) (c) arguably plays a very small role in the creation of international law today. It seems as if the views of traditionalists like the aforementioned Tunkin and Guggenheim have prevailed.

Nonetheless, General Principles, cf. Article 38 (1) (c) *could* provide a basis for the instant formation of a duty for states to protect the ecological sustainability of the global environmental system, as I have argued above in VII.

**d) A new approach to interpretation of international law**

Under the traditional sovereignty regime, treaty interpretation is seen as a sovereign prerogative and an "internal affair" of each state. As a rule, states seek to minimize the degree of treaty limitations in their sovereign freedoms to act in accordance with their own free will. States may interpret their treaty obligations narrowly and defeat their purpose without risking sanctions.[96]

A paradigm of sustainability of the global environmental system would rather oblige states

(accessed 13 December 2019), Arie Trouwborst, "The Precautionary Principle And The Burden Of Proof", in "Precautionary Rights and Duties of States", Brill 2006, Chapter 8.

[93] Hans Christian Bugge, "Lærebok i Miljøforvaltningsrett", 4th Edition, Universitetsforlaget 2015, p. 145–146.

[94] Sands and Peel, supra note, 8 p. 249.

[95] See Bin Cheng, "United Nations Resolutions on Outer Space: "Instant" International Customary Law", Indian Journal of International Journal Vol. 5, 1965, p. 36.

[96] Nyland, supra note 14, p. 40–45.

to interpret the vast number of existing norms of international environmental law, including the large mass of treaties, principles, case law, as well as international and domestic regulations and standards, in a way that would further the protection of the carrying capacity of the global environment.

## IX. Concluding remarks

The problem of serious global environmental destruction dictates an urgent need for a legally binding obligation for states to protect the sustainability, or carrying capacity, of the global environmental system.

We cannot solve the global environmental problems with the same sovereignty-based paradigm that caused them.

There is a need to replace the existing understanding of sovereignty, which arguably serves as a legal basis for environmental destruction. As I have shown, there is a potential for reinterpreting or reframing the principle of sovereignty. States ought to have a duty to protect the environmental sovereignty – the sustainability – of all states.

A new paradigm based on the nature of the global problem of environmental destruction, distancing itself from the traditional sovereignty and consent -to new obligations- based approach taken in the ICJ statute Article 38 (1) a) and b), can be criticized as being a utopian theory of what international law ought to be. However, as I have shown, a duty for states to protect their own environment in order to protect the sustainability of the global environment may also find support by a progressive interpretation of the established sources of international law. It would entail an absolute duty for states to uphold the carrying capacity of the global environment, and it could serve several important functions.

The new paradigm ought to be a duty for states to protect the sustainability of the global environmental system.