TEXTE
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Legal Instruments to implement the objective "Land Degradation Neutral World" in International Law

For our Environment

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Legal Instruments to implement the objective "Land Degradation Neutral World" in International Law

by

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List of Abbreviations

ACEP	Agricultural Conservation Easement Program
APP	Permanent preservation areas
Art.	Article
BPR	Biocidal Product Regulation
CAP	Common Agricultural Policy
CBD	Convention on Biological Diversity
CEE	Central and Eastern Europe
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CETESB	Companhia Ambiental do Estado de de São Paulo; São Paulo Environmental Agency
CONAMA	Conselho Nacional do Meio Ambiente
CF	Constituição Federal; Federal Constitution
CRP	Conservation Reserve Program
CSP	Conservation Stewardship Program
COP	Conference of the Parties
cp.	Compare
CRAs	Cotas de Reserva Ambiental; Forest Reserve Credits
CWA	Clean Water Act
CEQ	Council on Environmental Quality
DG	Directorate-General
EC	European Community
EEA	European Economic Area
EEC	European Economic Community
e.g.	exemplī grātiā; for example
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
EU	European Union
FSA	Farm Service Agency
HEL	Highly-erodable land
i.a.	Inter alia
ibid.	ibidem
IED	Industrial emissions directive

IBAMA	Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis
IPPC	Integrated Pollution Prevention and Control
LFR	Legal forest reserves
LDN	Land Degradation Neutrality
LDNW	Land Degradation Neutral World
NAP	National action programme
NEPA	National Environmental Policy Act
No.	Number
NPL	National Priorities List
NRCS	Natural Resources Conservation Service
OM	Organic matter
para.	Paragraph
PBT	Persistent Bioaccumulative and Toxic substances
RCRA	Resource Conservation and Recovery Act
RCPP	Regional Conservation Partnership Program
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
RIMA	Relatório de Impactos Ambientais; environmental impact report
ROG	Raumordnungsgesetz (German Federal Spatial Planning Law)
SNUC	Sistema Nacional de Unidades de Conservação da Natureza
UNCCD	United Nations Convention to Combat Desertification
UNFCCC	United Nations Framework Convention on Climate Change
US	United States
USDA	United States Department of Agriculture
vPvB	Very persistent and very bioaccumulative

Executive Summary

Soil is a limited, non-renewable resource which is necessary for food production as well as other vital ecosystem services. However, soils are being depleted at a rapid rate due to various pressures. With global food demand continuing to rise, it is necessary to preserve the land which is currently being used as well as restore the land resources where possible.

Thus, soil protection plays an increasingly important role at the global level. In the final document of the conference of the United Nations on sustainable development in June 2012 in Rio de Janeiro (Rio+20 Conference), the international community thus agreed to aim for a "land degradation neutral world" (hereinafter: LDNW). Land degradation is defined under the UNCCD as "reduction or loss, in arid, semi-arid and dry sub-humid areas, of the biological or economic productivity and complexity of rainfed cropland, irrigated cropland, or range, pasture, forest and woodlands resulting from land uses or from a process or combination of processes, including processes arising from human activities and habitation patterns, such as: (i) soil erosion caused by wind and/or water; (ii) deterioration of the physical, chemical and biological or economic properties of soil; and (iii) long-term loss of natural vegetation".[1]

There is no consensus as to the definition of the LDNW concept on the international level; however, the working definition of land degradation neutrality (LDN) that provides the fundamental basis for this report is "a state whereby the amount of healthy and productive land resources, necessary to support vital ecosystem services, remains stable or increases within specified temporal and spatial scales. LDN can occur as the result of natural regeneration or improved land management practices and ecosystem restoration".[2] In principle, international obligations to achieve this goal could be included in legal instruments such as the United Nations Framework Convention on Climate Change (UNFCCC), the Convention on Biological Diversity (CBD) or the United Nations Convention to Combat Desertification (UNCCD).

Instruments which would contribute toward this goal can be broken down into three different categories: prevention, remediation/offsetting, and planning. This study aimed to identify whether there are appropriate national legal instruments from three different case study countries – European Union/Germany, the United States, and Brazil – which could be integrated into international law in order to implement the LDNW target. The study also aimed to determine in which format the instruments could best be upscaled to the international level, e.g., annex, protocol, amendment, etc. of an international agreement. For this, an analysis of three major international agreements (UNFCCC, CBD, and UNCCD) which could potentially be used to upscale the national legal instruments was conducted to identify where those conventions have gaps in coverage of land degradation.

The three case studies resulted in examples of national legislation which contribute to prevention, remediation/offsetting, and planning against land degradation. The laws varied in terms of whether they covered one or all of these categories, and they also varied in the scope of soil threats addressed. Of the many soil threats which exist globally, only the following were included in the analysis: soil erosion, contamination, sealing, and salinisation. Wetland destruction was mentioned in the analysis in some relevant cases due to the special role wetlands and organic soils play in landscapes and the water and climate cycles.[3] Below is Table 1 showing the breakdown of the relevant national laws

1 UNCCD, Article 1(f).

2 UNCCD Intergovernmental Working Group (IWG) on the follow up to the outcomes of Rio+20, Task 1 – Science-based definition of land degradation neutrality, 28 May 2014.

3 Ramsar Convention, The Importance of Wetlands, http://www.ramsar.org/about/the-importance-of-wetlands.

identified for prevention, remediation/offsetting, and planning against land degradation and the soil threats to which they apply.

Table 1: Overall matrix of national legislation relevant to land degradation and soil threat (per case study)

Case Study	Laws	Prevention	Remediation/ Offsetting	Planning	Threats
European Union	Thematic Strategy for Soil Protection	X	X	X	Erosion, contamination, sealing, salinisation
	Environmental Liability Directive	X	X		Contamination, erosion
	Directive 2008/1/EC on integrated pollution prevention and control	X			Contamination
	Directive 2010/75/EU on industrial emissions (integrated pollution prevention and control) (IED)	(X)[4]	X		Contamination
	Directive 2014/52/EU on the assessment of the effects of certain public and private projects on the environment (EIA Directive)			X	Sealing, erosion
	Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (SEA Directive)			X	Damage to the environment through infrastructural projects; threats to soil not explicitly described
	Council Directive 86/278/EEC on the protection of the environment, and in particular of the soil, when sewage sludge is used in agriculture	X	X	(X)	Contamination
	Biocidal Products Regulation – EU 528/2012	X			Contamination
	Council Directive 1999/31/EC on the landfill of waste	X			Contamination

4 Weak expression

	Directive 2008/98/EC on waste and repealing certain Directives	X			Contamination
	Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora	X		(X)	Contamination, erosion, sealing
	2013 CAP Reform, based on Council Regulation (EC) No 1259/1999 establishing common rules for direct support schemes under the common agricultural policy	X			Erosion, sealing
	Draft Soil Framework Directive (rejected)	X	X		Erosion, salinisation
Germany	Federal Soil Protection Act	(X)	X	X	Erosion, sealing, contamination
	Law on Fertilisers and Plant Conservation	X	X		Contamination
	Federal Nature Conservation Act	X		X	Erosion
	Building Law	X		X	Erosion, sealing, compaction
	Spatial Planning Law			X	Sealing, compaction
	Federal Forest Law	X		X	Erosion, compaction
	Soft law of the Länder	X	X	X	Sealing, erosion, contamination
	Soft law (strategies, concepts)	X		X	Sealing, contamination, erosion
United States	Resource Conservation and Recovery Act (RCRA)	X	X	X	Contamination
	Clean Water Act (CWA)	X	X		Erosion, contamination
	Agricultural Act of 2014	X	X	X	Erosion, sealing, salinisation
	National Environmental Policy Act (NEPA)	X		X	Sealing, contamination, erosion
	Conservation Title 16	X	X	X	Erosion, sealing
	Comprehensive Environmental Response, Compensation , and Liability Act (CERCLA)		X		Contamination

	National Urban Policy and New Community Development			X	Sealing, contamination
Brazil	Federal Constitution	X	X		Erosion, contamination
	Contaminated Land, CONAMA Resolution 001/86	X		X	Erosion, contamination
	National Environmental Policy (No. 6,938/1981)	X	X	X	Erosion, contamination
	CONAMA Resolution 420/09		X		Contamination
	Forest Code, Law No. 12,651/2012	X	X	X	Erosion, sealing, salinisation
	Atlantic Forest Law, Law No. 11,428/2006	X	X	X	Erosion, sealing
	Decree No. 59,263 on Contaminated Areas	X	X	X	Contamination
	Brazilian Nature Conservation System (No. 9,985/2000)	X	X		Erosion
	Water Law (No. 9,433/97)	X		X	Contamination
	Waste Law (No. 12,305/2010)	X	X	X	Contamination
	National Policy on Climate Change (No. 12,187/2009)		X		Erosion
	Agricultural Policy (No. 8,171/1991)	X	X		Erosion

Part 2 of the report focuses on the international level and the potential for implementation of the LDNW target. An analysis was performed of the UNFCCC and its Kyoto Protocol, the CBD and its two protocols, and the UNCCD with regards to the existing measures and provisions contained within the agreements that address prevention, remediation/offsetting, and planning as well as gaps which exist under these three categories in the respective agreements. Overall, there is an emphasis in all three conventions on the prevention of impacts on ecosystems, land, sinks and reservoirs within the focus of that particular convention – climate change, biodiversity degradation, or desertification/land degradation. Remediation/offsetting is weaker than prevention under the agreements, which is needed in order to effectively implement the LDNW target by counter-balancing land degradation that happens regardless of prevention actions. In addition to specific issues, such as increasing the scope of project-based mechanisms and emissions trading schemes to include more land degradation prevention and remediation/offsetting actions and including environmental impact assessments under the UNCCD, planning currently required under each of the Conventions should be more effectively utilised, coordinated, and comprehensive to prevent and remediate/offset land degradation.

A review was also performed to determine what the legal status and requirements were for the analysed international agreements in terms of amendments and adopting protocols. The review revealed that all instruments have similar rules regulating the amendment of the respective convention. Additionally, the UNFCCC and the CBD both have enabling clauses contained in the text which provide for adoption of protocols to the Convention by the Parties. The UNCCD currently has five regional implementation annexes, but the Convention allows for adoption of general annexes which become part of the Convention. Additionally, the UNCCD does not have an enabling clause providing for adoption of a protocol by the Parties; however, the analysis revealed similar instances where international agreements did not possess an enabling clause and protocols were adopted by the Parties. Thus, the UNCCD Parties (all or only those who wish to sign and ratify) would be free to adopt a legally-binding protocol as a new international treaty under the umbrella of the Convention. Finally, the examples of national legislation identified in Part 1 of the report were analysed to determine whether upscaling to the international level is appropriate. Below is an overview of some of the national laws identified and their conceptual approaches which are relevant to prevention, remediation/offsetting and planning against land degradation.

Prevention

- Designation of protected areas, which was instituted under the US Title 16 National Landscape Conservation System as well as the German Federal Nature Conservation Act (BNatSchG) (the latter of which also includes biotope networks). Permanent preservation areas (APP) and legal forest reserves (LFRs) are also available under Brazil's Forest Code's rules.
- Sustainable management contracts can be agreed with private actors regarding their land management as found under the Title 16 Soil Conservation and Domestic Allotment Act.
- Soil monitoring according to Brazil's CONAMA Resolution No. 420/2009 and the EU Soil Thematic Strategy, as well as baseline reports for monitoring soil pollution and groundwater quality to avoid deterioration from operation of an installation under the EU Directive 2010/75/EU on industrial emissions (integrated pollution prevention and control).
- Adding an environmental impact assessment (EIA) (e.g., requirement in the US statute NEPA) obligation to the UNCCD could close that gap in the international agreements as both the UNFCCC and the CBD contain this requirement. A citizen suit mechanism could also be provided to challenge the government's failure to perform an environmental assessment.
- Complete, comprehensive lifecycle analysis for highly soil-damaging harmful substances under the EU Biocidal Products Regulation.

- Soil protection within building activities under the German Federal Building Act (BauGB). Mandatory cross-compliance measures (broad standards or only on high-risk lands) tied to government funding, e.g., the US Farm Bill and EU Common Agricultural Policy (CAP).
- Restrictions on vegetation removal in Brazil's Atlantic Forest Law so that it primarily takes place on land that is already substantially degraded.
- Funds made available for voluntary actions in the public interest, e.g., set-asides, sustainable agricultural practices, legal protection against conversion of land, e.g., EU CAP permanent pasture requirements.
- Easements or legal protection against conversion could be a useful tool to protect certain areas against degradation (i.e., sealing, contamination), as well as government funding to incentivise or leverage collective action or public-private partnerships, e.g., US Farm Bill. Economic instruments can also be used by local authorities to incentivise prevention of land degradation, e.g. tradable land use certificates or a charge for land designated for building.
- Setting water quality standards as done under the US CWA that influence land-based actions as non-point sources of pollution, and pollution limits for air, water, etc. as under the integrated pollution prevention and control EU Directive 2008/1/EC. The EU sewage sludge Directive (86/278/EEC) also includes limits on heavy metal content as a protection measure for additions to agricultural soil.
- Code of good practices for fertiliser and growing substrates usage on farmland under the German Fertilizer Decree (DüV).
- Permitting schemes for regulated conversion of certain land types (e.g., wetland conversion under the US CWA) and actors who conduct potentially extremely dangerous and harmful activities (e.g., generating, storing, transporting and disposing hazardous waste under the US statute RCRA).
- Tracking system with information reported by each actor along the chain (e.g., tracking hazardous waste movement from "cradle-to-grave" under RCRA in the US).

Remediation/Offsetting

- Building a large fund through a tax on the industries producing and selling the hazardous products which may lead to contamination, e.g., similar to the polluter pays concept but their financial contribution is before harm has occurred and based on the high risk of harm presented by their activities. Those funds are then available for quick governmental response to hazardous environmental incidents (e.g., CERCLA Superfund in the US).
- Cost-recovery mechanism for the government to claim reimbursement from the responsible actor for cleanup of hazardous waste contamination in the RCRA and CERCLA statutes of the US.
- Removal, control, containment or diminishment of the relevant, even pre-existing, contaminants that have caused damage to the land under Annex II of the EU Environmental Liability Directive.
- Legally binding compensation for environmental impacts from building measures (impact mitigation regulation) under the German Federal Building Act linked to the German Federal Nature Conservation Act (BNatSchG).
- Funding provisions are provided for remediation under the US Forest Landscape Restoration Act, for example, in the form of low-interest loans, cost-share agreements, and reimbursement of private actors for restoration costs.
- Procedures for identification of contaminated land under the Brazilian Decree No. 59,263, including monitoring incentives and guidance on transparency in contamination-related aspects of land degradation.
- Forest Reserve Credits (CRAs) in Brazil's Forest Code can offset the lack of a legal reserve on one rural property by establishing a reserve on another, provided they are located in the same biome and the same State where the CRAs are created.

- Offsetting for wetland conversion under the US CWA or non-compliance with restrictions under the US Farm Bill conservation compliance programme could help balance the amount of wetlands that are in existence. Accompanying quality standards and monitoring/enforcement could ensure the substitute wetland was of equal or greater ecological value than the destroyed wetland.

Planning

- Comprehensive long-term planning of existing and future land uses throughout a landscape in order to identify where pressures exist and which would be the most appropriate use for different types of land (e.g., zoning ordinances designating certain areas of the city for specific uses in accordance with the comprehensive land use plan in the US).
- Participatory planning for remediation actions under the US Forest Landscape Restoration Act, and examination of and remediation planning for contaminated soil under the German Federal Soil Protection Act.
- A number of planning approaches, such as creating registers for areas affected by desertification under the Brazilian Agricultural Policy (Law No. 8,171/91).

Overall, none of the identified national legal instruments were suitable to directly adopt at the international level to achieve the LDNW target. Many similar obstacles to direct upscaling were found across the three case study countries: some national laws were too embedded within the national legal structure, some were too specific in terms of the scope of land covered or the issue addressed, some were too broad and general in their coverage to be useful for contributing to land degradation neutrality, some were already included in international obligations, and some were procedural requirements which were unlikely to have much impact on the problem.

Based on this finding, the analysis then considered whether elements or mechanisms from the national laws could instead provide examples to incorporate into a comprehensive scheme at the international level designed to address land degradation and implement the LDNW target. In fact, many of the laws were found to offer interesting and potentially useful elements or mechanisms. The list below provides an overview of those mechanisms identified which could contribute to prevention, remediation/offsetting, and planning against land degradation and could be incorporated into a comprehensive approach to implement the LDNW at the international level.

Legal mechanisms for potential upscaling

- Permitting schemes for potentially harmful activities, e.g., for actors handling wastes, industrial installations, to convert wetlands to other uses, to discharge pollutants, etc.
    - Determination of emission limit value
    - Determination of specific environmental quality standards, especially for soil and water
    - Determination of monitoring requirements
- Requirement of a baseline report which documents the status of soil and groundwater before a potentially harmful activity is started combined with the obligation after the cessation of the operation to remediate negative effects to achieve the former status of soils and groundwater
- Mandatory conservation compliance measures in exchange for government payments as a means to allow e.g. farmers to abide by the standards
    - Determination of standards for certain land uses, e.g. agriculture
    - Pesticides, biocides, sewage sludge, nitrate
- Land use planning for designated uses as well as protected areas
    - Protection of land/soil of specific values: prohibition on use
    - Determination of areas which are already degraded: open for primary use

        - Detrimental projects are only allowed if public interests are overriding
- Urban planning requirements combined with an EIA and an offsetting obligation already during the planning phase
        - Obligation to primarily use already developed areas
- General offsetting requirement for degradation of a parcel of land
        - Need for indicators for land degradation and remediation: Eco-account approaches
- Obligation to remediate existing land degradation
        - Obligation for private and public actors, including the owner of the land, independent of whether he or she has caused the damage
        - Obligation of competent authorities to remediate the damage and gain reimbursement rights against the responsible private actors
        - If necessary, also for old brownfields sites
- Specific regulatory provisions for certain land cover types, such as forests or wetlands
- Planning instruments for the achievement of LDNW
        - Determination of main drivers of land degradation
        - Determination of programmes of measures
            - Reduction of land degradation
            - Remediation/offsetting of land degradation
            - Balance has to be zero
- Funding mechanisms which provide for private actors to manage land using practices in the public interest or remediate degradation, e.g., through cost-sharing, low-interest loans, or partial reimbursement by the government, and innovative economic instruments
- Procedural mechanisms that require environmental impacts to be taken into account during the decisions-making process, i.e., EIA and SEA, including plans for activities which might cause land degradation
- Setting land/soil and water quality standards, which would require land-based modifications of use in order to reduce non-point source pollution levels
- Information-gathering systems
- Recordkeeping, reporting, tracking systems (e.g., hazardous waste movement), and transparent decision-making process using participatory approaches
- Taxation or monetary mechanisms to build up large funding reserves which can be used by government actors to address dangerous pollution incidents quickly rather than wait for the responsible private actor, as well as a cost-recovery mechanism to seek reimbursement for response costs.

INTRODUCTION

Soil is a limited, non-renewable resource. Soil conservation is indispensable for sustainable development. The production of food, feed and renewable raw materials requires fertile soils. Soils also serve important ecosystem functions, such as providing a carbon sink and promoting biodiversity.

However, approximately one third of the world's arable land is already affected by land degradation.

According to United Nations estimations, 10 to 12 million hectares of fertile soil is lost annually due to unsustainable management practices. This amount equates to almost all of the agriculturally used land in Italy. There are several causes of land degradation. They include unsustainable agricultural practices and increasing pressure to utilise resources (overfertilisation, overgrazing, soil compaction, etc.), extreme weather events caused by climate change, but also by sealing resulting from increased urbanisation and infrastructure measures.

Mounting pressure on soils results from the growing world population, the increasing demand for agricultural products resulting from changing consumption patterns demanding more land-intensive products from animal origin as well as a growing demand for renewable raw materials for material and energy use purposes.

Furthermore, the expected demand is likely to exceed the future increase in surface productivity. Yet there are hardly any global land reserves that could be reactivated. In addition, an expansion of agricultural land may become a burden for other important assets such as ecosystems which are of great importance for the climate and biodiversity.

Thus, soil protection plays an increasingly important role at the global level.
In the run-up to the Rio+20 Conference, the Secretariat of the UNCCD provided proposals as to how agricultural and soil-related issues could be considered in the final document of the Rio+20 Conference. In the final document of the conference of the United Nations on sustainable development in June 2012 in Rio de Janeiro (Rio+20 Conference), The Future We Want, the international community thus agreed to aim for a "land degradation neutral world" (hereinafter: LDNW).[5] Subsequently, the 11th Conference of the Parties of UNCCD, held in Windhoek (Namibia) in 2013, established an "Intergovernmental Working Group" in order to 1) work out a science-based definition of the "land degradation neutral world" target, 2) develop options for the implementation of the target, and 3) submit proposals explaining how the UNCCD itself could implement the objective (in strategic decisions, for example, but also through potential legal revisions of the UNCCD, e.g., a new protocol or thematic annex). Additionally, the Open Working Group on the Sustainable Development Goals being developed for the UN agenda post-2015 has included achievement of a land degradation neutral world by 2030 in its proposals (see Goal 15.3).[6] However, as seen from the Thirteenth Session outcome document, there are varying opinions as to how firm the target on reducing land degradation should be within the SDGs.[7]

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5 United Nations General Assembly, The Future We Want, Resolution 66/288 adopted by the General Assembly on 27 July 2012, paragraph 206. Available at http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N11/476/10/PDF/N1147610.pdf?OpenElement.

6 United Nations Open Working Group on Sustainable Development Goals, Introduction and Proposed Goals and Targets on Sustainable Development for the Post 2015 Development Agenda. Available at http://sustainabledevelopment.un.org/content/documents/4523zerodraft.pdf.

7 United Nations Open Working Group on Sustainable Development Goals, Final Compilation of Amendments to Goals and Targets By Major Groups and other stakeholders including citizen's responses to MY World 6 priorities. To inform the Thirteenth and last Session of the Open Working Group on Sustainable Development Goals, 14-18 July 2014. Available at http://sustainabledevelopment.un.org/content/documents/4438mgscompilationowg13.pdf.

Land degradation is defined under the UNCCD as "reduction or loss, in arid, semi-arid and dry sub-humid areas, of the biological or economic productivity and complexity of rainfed cropland, irrigated cropland, or range, pasture, forest and woodlands resulting from land uses or from a process or combination of processes, including processes arising from human activities and habitation patterns, such as: (i) soil erosion caused by wind and/or water; (ii) deterioration of the physical, chemical and biological or economic properties of soil; and (iii) long-term loss of natural vegetation".[8] There is no consensus as to the definition of the LDNW concept on the international level; however, the working definition of land degradation neutrality (LDN) that provides the fundamental basis for this report is "a state whereby the amount of healthy and productive land resources, necessary to support vital ecosystem services, remains stable or increases within specified temporal and spatial scales. LDN can occur as the result of natural regeneration or improved land management practices and ecosystem restoration".[9] This means that in light of land degradation occurring due to urban expansion, for instance, measures and actions aimed at restoring or rehabilitating land would counter-balance this degradation so that a zero net balance of land degradation is achieved.

These types of measures could be integrated into international law in order to achieve a LDNW. The international community has discussed various options for integrating the LDNW objective into international regimes. In principle, international obligations could be included in legal instruments such as the United Nations Framework Convention on Climate Change (UNFCCC), the Convention on Biological Diversity (CBD) or the United Nations Convention to Combat Desertification (UNCCD). In fact, much of the debate has taken place under the umbrella of the UNCCD in particular.

Instruments which would contribute toward this goal can be broken down into three different categories: prevention, remediation/offsetting, and planning. In terms of instruments which contribute to prevention of land degradation, we understand this to mean measures which restrict certain types of uses or actions on land or minimise the negative impact of processes in order to conserve or maintain land quality. Instruments of remediation include those which aim to restore or rehabilitate lands from their particular state of degradation into healthier, functioning ecosystems. This type of action may be required through provisions demanding offsetting, which would require an equal amount of restored or rehabilitated land in order to allow a specific incident of land degradation. For the purposes of this report, planning instruments would include those which aim to direct actions or processes through longer-term strategies, programmes or plans in order to achieve zero net land degradation, such as land use planning mechanisms (e.g., zoning, urban growth control measures) and strategies promoting both prevention and remediation/offsetting.
Based on individual country studies, the aim of the project is to assess whether there are appropriate national legal instruments which exist within those systems that could support the achievement of the LDNW objective. In addition, the project aims to examine whether and in what form such legal instruments could be upscaled to the international level to help achieve the LDNW objective, e.g., by being transformed into binding rules of international law.

Part one of the report begins with a brief description of the methodology used during this study. Subsequently, case studies are presented for three different countries: Germany/European Union, United States of America, and Brazil. Each case study outlines the most relevant laws pertaining to land degradation prevention, remediation, and planning within the country's national legislative structure. Part two of the report begins with an analysis of relevant international agreements which could incorporate provisions aimed at preventing, remediating or planning for zero net land degradation. The

8 UNCCD, Article 1(f).

9 UNCCD Intergovernmental Working Group (IWG) on the follow up to the outcomes of Rio+20, Task 1 – Science-based definition of land degradation neutrality, 28 May 2014.

analysis provides an overview of the existing prevention, remediation, or planning provisions within those international laws and whether they contain gaps with regard to the three categories of provisions. Next, there is an analysis of whether there is a legal basis for including LDNW provisions within the UNFCCC, CBD, or UNCCD, specifically in terms of amendment of the conventions as such and specific authority included by the Parties to adopt protocols under the conventions. The final section provides an analysis as to whether the national legal instruments from the three case study countries (identified in Part 1) are appropriate for inclusion at the international level or whether the most relevant provisions, measures, and mechanisms should be incorporated into international obligations.

METHODOLOGY

The study aimed to identify national level examples of legislation, regulations, instruments and measures which could contribute to the LDNW target. The method for carrying out such an analysis at the national level was to choose three specific countries for an in-depth look at the existing legislative framework.

- Germany with the inclusion of key EU directives and regulations was chosen due to its comprehensive framework of environmental protection laws, innovative soil protection standards, as well as the key role the country plays both in international negotiations and within the EU.
- The United States was included as a case study because it also has a well-developed framework of environmental protection laws, it constitutes a large land area with diverse ecosystems that could be affected by land degradation, land rights – held primarily by private actors – play a strong role in the legal system, and the country also has a strong influence in international negotiations.
- Brazil was chosen also due to its large land mass, its rapid development including industrialisation, and its invaluable biological diversity and ecosystems that are essential to maintain for many different reasons, including providing an enormous sink for greenhouse gases that threaten climate change, ensuring precipitation, and preventing extinction of different species of flora and fauna.

A screening of each country's national legislative framework was conducted in order to identify relevant national laws and regulations which contribute to prevention, remediation, and/or planning for land degradation neutrality. Of the many soil threats which exist globally, only the following were included in the analysis: soil erosion, contamination, sealing, and salinisation. Wetland destruction was mentioned in the analysis in some relevant cases due to the special role wetlands and organic soils play in landscapes and the water and climate cycles.[10] The most relevant laws were selected through expert judgment based on their general objectives and specific provisions which pertain to prevention, remediation, or planning in relation to these specific soil threats and/or land degradation more generally. Assessment of the primary legal instruments was carried out as well as reference to secondary literature. Additionally, primary legal instruments at the international level were analysed as well as secondary literature, presentations, opinions, and statements issued by various actors on the international scale as to the LDNW target and its potential integration into international law. The UNFCCC, CBD and UNCCD were chosen for analysis since subsequent to conclusion of the Rio+20 conference and issuance of the document "The Future We Want" containing the LDNW target, those three conventions have been identified as the most probable and suitable instruments of international law which could formally contribute to its implementation.

10 Ramsar Convention, The Importance of Wetlands, http://www.ramsar.org/about/the-importance-of-wetlands.

1 PART 1: CASE STUDIES

1.1 EU / Germany

1.1.1 Introduction to EU

This section focuses on soil degradation. Important and widespread specifications of soil degradation are soil erosion, soil contamination and soil sealing. There are common definitions and descriptions available[11] for these concepts:

> "**Soil erosion** is regarded as one of the major and most widespread forms of land degradation (EEA, 2003). Indeed, about 16% of the total land area in Europe (excluding Russia) is affected by soil erosion to some degree (Oldeman et al., 1991 in EEA, 2003). In particular, water erosion is a more common form of erosion, contributing to 92% of the total affected area. Three zones of erosion can be distinguished in Europe: a southern zone characterised by severe water erosion; a northern loess zone with moderate rates of water erosion; and an eastern zone where the two zones overlap and where former intensive agricultural practices caused significant erosion problems (EEA, 2000)."[12]
>
> "**Soil contamination** is one of the most widespread types of soil degradation in Europe: 180 million ha are affected by pesticides; 170 million ha by nitrates and phosphates; and 85 million ha by acidification (EEA, 1995). The number of potentially contaminated sites in the EU-25 has been estimated at approximately 3.5 million (European Commission, 2006). Based on available data, losses deriving from industrial activities and former waste sites are the major causes of local contamination in most of the countries analysed. For diffuse contamination, hot spots are located in those areas where the intensity of agricultural chemical use is highest: in the lowlands of Western Europe (Denmark, the Netherlands, Belgium, Luxembourg and the north of France) (EEA, 2000)."[13]
>
> "**Soil sealing** has the greatest impacts in urban and metropolitan areas, where large areas of the land are covered with buildings and infrastructure. Over the past 20 years, built-up areas have been steadily increasing all over Europe (EEA, 2003). In already intensively urbanized countries like the Netherlands or Germany the rate of soil loss due to surface sealing is high. In the Mediterranean region, soil sealing is a particular problem along the coasts where rapid urbanisation is associated with the expansion of tourism. Very high rates of sealing are now predicted for countries like Portugal, Finland or Ireland where urbanisation levels have been low to date."[14]

1.1.2 Legal System

European Union law has been subject to a constant development, including numerous revisions of its treaties. The most recent amendment took place when the Lisbon Treaty came into force in 2009. The most important sources of EU law are primary law and secondary law. The Treaty on the Functioning of the European Union (TFEU) and the Treaty on European Union (TEU) are major sources of primary

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11 For all definitions see as a main source of reference Bowyer, Catherine, Sirini Withana, Ian Fenn, Samuel Bassi, Megan Lewis, Tamsin Cooper, Patricia Benito and Mudgal Shailendra (2009): Land Degradation and Desertification. Study for the European Parliament, Policy Department Economic and Scientific Policy. IP/A/ENVI/ST/2008-23, which includes further references.

12 Ibid.

13 Ibid.

14 Ibid.

law. Binding sources of secondary law can be divided into Regulations, which have general application and are binding in their entirety and directly applicable in all Member States (cp. Article 288 TFEU), Directives, which need to be transposed by the EU Member States within a certain prescribed timeframe, and Decisions, which are binding on the addressees in their entirety (cp. Article 288 TFEU). Directives stipulate a certain objective that needs to be met by the Member States. In view of this objective, Member States are entitled to choose between forms and measures. In doing so, they are, however, obliged to ensure the Directive's practical effectiveness ("effet utile"). The primacy of European law is settled case law.

The standard ("ordinary") legislative procedure is regulated in Article 289 and 294 TFEU. Upon a proposal from the European Commission, Regulations, Directives or Decisions are adopted jointly by the European Parliament and the Council of the European Union in accordance with the rules stipulated in Article 294 TFEU.

If Member States fail to comply with EU law, the European Commission is entitled to initiative an infringement procedure against the Member State in breach of EU law. The judicial system of the European Union is made up of the Court of Justice of the European Union, the General Court and specialised courts and ensures that EU law is observed when the EU treaties are interpreted and applied (cp. Article 19 TEU).

At the EU level there are no provisions or funding mechanisms[15] below the broad frame of the Environmental Programme are available for the direct protection of soils. The reasons are a) that EU legislation does not include a special system for soil policy and b) that soil is a complex issue. However, the protection of soil is addressed in several EU Directives and Regulations which will be outlined below in more detail.

Due to the subsidiarity principle and possible additional expenses for Member States, the drafted Soil Protection Framework Directive (2006) and two other versions have been rejected in 2014. The aim of the Directive was to combat increasing desertification in Europe and adjust national soil protection efforts to close the legal gap with respect to soil protection. Nevertheless, the Thematic Strategy for Soil Protection provides the basis for a continuous discussion about an improved soil protection.

Numerous different policy approaches dealing with land degradation can be identified in Europe.[16] Generally, the 28 Member States must submit regular reports on the implementation of Directives. As far as the Thematic Strategy for Soil Protection is concerned, Member States have to outline strategic principles, which do not, however, constitute binding requirements.

1.1.3 Important laws

Below is Table 2 indicating the land degradation categories to which each relevant law identified in the EU case study applies.

15 Nevertheless, over the past few years, there is increasing discussion on EU level about economic instruments, like "habitat banking", see ICF/GHK (2013): Exploring potential demand for and supply of habitat banking in the EU and appropriate design elements for a habitat banking scheme,Final Report submitted to DG Environment.

16 Cp. Bowyer, Catherine, Sirini Withana, Ian Fenn, Samuel Bassi, Megan Lewis, Tamsin Cooper, Patricia Benito and Mudgal Shailendra (2009): Land Degradation and Desertification. Study for the European Parliament, Policy Department Economic and Scientific Policy. IP/A/ENVI/ST/2008-23.

Table 2: Matrix of European Union Laws by Category and Soil Threat

Case Study	Laws	Prevention	Remediation/ Offsetting	Planning	Threats
European Union	Thematic Strategy for Soil Protection	X	X	X	Erosion, contamination, sealing, salinisation
	Environmental Liability Directive	X	X		Contamination, erosion
	Directive 2008/1/EC on integrated pollution prevention and control	X			Contamination
	Directive 2010/75/EU on industrial emissions (integrated pollution prevention and control) (IED)	(X)[17]	X		Contamination
	Directive 2014/52/EU on the assessment of the effects of certain public and private projects on the environment (EIA Directive)			X	Sealing, erosion
	Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (SEA Directive)			X	Damage to the environment through infrastructural projects; threats to soil not explicitly described
	Council Directive 86/278/EEC on the protection of the environment, and in particular of the soil, when sewage sludge is used in agriculture	X	X	(X)	Contamination
	Biocidal Products Regulation – EU 528/2012	X			Contamination
	Council Directive 1999/31/EC on the landfill of waste	X			Contamination
	Directive 2008/98/EC on waste and repealing certain Directives	X			Contamination

[17] (X) indicates that the law only weakly covers this aspect of land degradation prevention, remediation/offsetting, or planning.

	Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora	X		(X)	Contamination, erosion, sealing
	2013 CAP Reform, based on Council Regulation (EC) No 1259/1999 establishing common rules for direct support schemes under the common agricultural policy	X			Erosion, sealing
	Draft Soil Framework Directive (rejected)	X	X		Erosion, salinisation

1.1.3.1 Communication from the Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee of the Regions, COM(2006)231 final, Thematic Strategy for Soil Protection

The Thematic Strategy for Soil Protection addresses various aspects of soil protection. Generally, its introduction highlights the importance of soil as a natural resource. It defines soil as "the top layer of the earth's crust, formed by mineral particles, organic matter, water, air and living organisms", noting that "[i]t is the interface between earth, air and water and hosts most of the biosphere." Furthermore, the introduction explains that "[a]s soil formation is an extremely slow process, soil can be considered essentially as a non-renewable resource" and proceeds to note that "[s]oil provides us with food, biomass and raw materials" and "serves as a platform for human activities and landscape and as an archive of heritage and plays a central role as a habitat and gene pool." In addition, the Strategy emphasises that soil "stores, filters and transforms many substances, including water, nutrients and carbon. In fact, it is the biggest carbon store in the world (1,500 Giga tonnes). These functions must be protected because of both their "socio-economic and environmental importance" (cp. Thematic Strategy for Soil Protection para. 1).

In addition to stressing the importance of soil, the Strategy also addresses soil degradation, noting that "[s]oil is subject to a series of degradation processes or threats" which "include erosion, decline in organic matter, local and diffuse contamination, sealing, compaction, decline in biodiversity, salinisation, floods and landslides." Furthermore it is held that "[a] combination of some of these threats can ultimately lead arid or sub-arid climatic conditions to desertification" (cp. Thematic Strategy for Soil Protection para. 1).

In its "Assessment of the situation", the Strategy states that "[s]oil degradation is a serious problem in Europe. It is driven or exacerbated by human activity such as inadequate agricultural and forestry practices, industrial activities, tourism, urban and industrial sprawl and construction works. These activities have a negative impact, preventing the soil from performing its broad range of functions and services to humans and ecosystems. This results in loss of soil fertility, carbon and biodiversity, lower water-retention capacity, disruption of gas and nutrient cycles and reduced degradation of contaminants." The Strategy also highlights that "[s]oil degradation has a direct impact on water and air quality, biodiversity and climate change. It can also impair the health of European citizens and threaten food and feed safety" (cp. Thematic Strategy for Soil Protection para. 2.1).

The stated objective of the Strategy is to ensure the protection and sustainable use of soil. It is highlighted that the Strategy must "take into account all the different functions that soils can perform, their variability and complexity and the range of different degradation processes to which they can be subject, while also considering socio-economic aspects" (cp. Thematic Strategy for Soil Protection para. 3.1).

The overall objective of protecting soil and using it sustainably is based on a number of guiding principles. These principles are:

"1. Preventing further soil degradation and preserving its functions:

2. when soil is used and its functions are exploited, action has to be taken on soil use and management patterns, and

3. when soil acts as a sink/receptor of the effects of human activities or environmental phenomena, action has to be taken at source.

4. Restoring degraded soils to a level of functionality consistent at least with current and intended use, thus also considering the cost implications of the restoration of soil" (cp. Thematic Strategy for Soil Protection para. 3.1)."

Conceptual approach: The Thematic Strategy for Soil Protection constitutes a first step towards developing an integrated EU policy for the protection of soils against pollution and erosion. The EU Commission’s Communication furthers the politically determined commitment to soil protection so as to have a full and systematic approach to achieving the soil protection objective.[18]

The Strategy is based on four key pillars: “framework legislation with protection and sustainable use of soil as its principal aim”, “integration of soil protection in the formulation and implementation of national and Community policies”, “closing the current recognised knowledge gap in certain areas of soil protection through research supported by Community and national research programmes” and “increasing public awareness of the need to protect soil” (cp. Thematic Strategy for Soil Protection para. 4).

The Strategy also addresses threats of particular importance, holding that these include erosion, organic matter decline, compaction, salinisation and landslides (cp. Thematic Strategy for Soil Protection para. 4.1).

Suitability: The Strategy provides a range of approaches to protect soils against pollution and erosion. Its principles and ideas, e.g. with regard to national research programmes and public awareness, support the sustainable use of soils in a precautionary manner and can be seen as innovative ideas for further application.

1.1.3.2 Directive 2004/35/CE of the European Parliament and of the Council of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage (Environmental Liability Directive)

The purpose of the Environmental Liability Directive “is to establish a framework of environmental liability based on the "polluter-pays" principle, to prevent and remedy environmental damage” (cp. Article 1 Directive 2004/35/CE). It includes a definition of “land damage” which, according to the Directive, covers “any land contamination that creates a significant risk of human health being adversely affected as a result of the direct or indirect introduction, in, on or under land, of substances, preparations, organisms or micro-organisms” (cp. Article 2 para. 1 lit. c) Directive 2004/35/CE).

The Environmental Liability Directive clearly specifies that environmental damage “also includes damage caused by airborne elements as far as they cause damage to water, land or protected species or natural habitats” (para. 4). Furthermore it highlights that the use of risk assessment procedures to determine to what extent human health is likely to be adversely affected is desirable for the purposes of assessing damage to land (para. 7).

Article 2 of the Environmental Liability Directive provides important definitions, including definitions of “environmental damage”, “natural resource” and “recovery”:

- “environmental damage” is defined as “damage to protected species and natural habitats, which is any damage that has significant adverse effects on reaching or maintaining the favourable conservation status of such habitats or species. The significance of such effects is to be assessed with reference to the baseline condition, taking account of the criteria set out in Annex I” (Article 2 para. 1 Directive 2004/35/CE);
- “natural resource” is held to cover species and natural habitats, water and land(Article 2 para. 12 Directive 2004/35/CE);

18 Cp. Thornton, Gareth, Martin Franz, David Edwards, Gernot Pahlen and Paul Nathanail (2007): The Challenge of Sustainability: incentives for brownfield regeneration in Europe, Environmental Science and Policy, Volume 10, Issue 2, April 2007, pp. 116 – 134.

- in the case of land damage, "recovery", including "natural recovery", is defined as "the elimination of any significant risk of adversely affecting human health" (Article 2 para. 15 Directive 2004/35/CE).

The Directive deals with the remediation of environmental damage in detail in, e.g. its Articles 5-8 Directive 2004/35/CE (focusing on preventive action, remedial action, determination of remedial measures, prevention and remediation costs).

In its Annex II ("Remedying of Environmental Damage"), the Directive addresses the remediation/offsetting of land damage in detail. Therein it is held that "necessary measures shall be taken to ensure, as a minimum, that the relevant contaminants are removed, controlled, contained or diminished so that the contaminated land, taking account of its current use or approved future use at the time of the damage, no longer poses any significant risk of adversely affecting human health." In addition, Annex II notes that "[t]he presence of such risks shall be assessed through risk-assessment procedures taking into account the characteristic and function of the soil, the type and concentration of the harmful substances, preparations, organisms or micro-organisms, their risk and the possibility of their dispersion. Use shall be ascertained on the basis of the land use regulations, or other relevant regulations, in force, if any, when the damage occurred." Furthermore, Annex II of the Directive stipulates that all necessary measures shall be taken to prevent any adverse effects on human health if the use of the land is changed and holds that "[i]f land use regulations, or other relevant regulations, are lacking, the nature of the relevant area where the damage occurred, taking into account its expected development, shall determine the use of the specific area. A natural recovery option, that is to say an option in which no direct human intervention in the recovery process would be taken, shall be considered."

The Directive is only applicable to damage that occurs after the year 2007 when it entered into force. However, the effects of soil damages are subject to changes in legislation. Under certain circumstances, such changes can also be applied with retroactive effect.[19] This retroactive effect could support changes in behaviour due to the possibility of responsibility for soil damaging activities. It would not affect citizens' reliance on legal certainty as the issues of soil degradation protection measures was known already before the new legislation comes into force.

Conceptual approach: The EU Directive on environmental liability provides a common legal framework for remediation/offsetting and prevention of environmental damages, and in particular soil destruction at reasonable costs. Articles 5-8 of the Directive focus on preventive action, remedial action, determination of remedial measures, prevention and remediation/offsetting costs. The Directive regulates how investors and performers of various harmful activities in the environment must take the necessary measures to prevent adverse impacts on the soil. It establishes a system according to which public authorities are obliged to ensure that a polluter restores the environment damaged by the polluter. Damage to land - other than contamination - is not addressed by the Directive. Furthermore, to be considered damage, land contamination needs to pose a significant risk to human health.[20]

Suitability: The most significant innovation of the Directive is that it expands the liability concept and approach to environmental damage as such. Unlike most civil liability schemes, the Directive does not require that the environmental good is in private ownership. In addition, the Directive stipu-

19 Rechtslexikon.net (2014): Rückwirkung von Gesetzen, http://www.rechtslexikon.net/d/r%C3%BCckwirkung-von-gesetzen/r%C3%BCckwirkung-von-gesetzen.htm.

20 Cp. Winter, Gerd, Jan H. Jans, Richard Macrory and Ludwig Kramer (2008): Weighing up the EC Environmental Liability Directive. Journal of Environmental Law 20:2.

lates that an operator is liable and builds on the polluter pays principle. Another novel feature of the Directive is that it focuses on repairing the damage.[21] Furthermore, cost recovery of remedial action is required and public operators are liable and cannot be treated differently from private ones. All these issues show innovative approaches worth taking into further consideration.

Another important matter is the question raised by this Directive as to whether instruments should be applicable to old damages, i.e. whether they should be applied with retroactive effect (see above). This effect could strengthen the effectiveness of instruments for a LDNW.

1.1.3.3 Directive 2008/1/EC of the European Parliament and of the Council of 15 January 2008 concerning integrated pollution prevention and control

The purpose and scope of Directive 2008/1/EC "is to achieve integrated prevention and control of pollution arising from the activities listed in Annex I. It lays down measures designed to prevent or, where that is not practicable, to reduce emissions in the air, water and land from the abovementioned activities, including measures concerning waste, in order to achieve a high level of protection of the environment taken as a whole, without prejudice to Directive 85/337/EEC and other relevant Community provisions" (Article 1 Directive 2008/1/EC).

Article 2 Directive 2008/1/EC provides the relevant definitions, including a definition of "pollution" which, according to the Directive "means the direct or indirect introduction, as a result of human activity, of substances, vibrations, heat or noise into the air, water or land which may be harmful to human health or the quality of the environment, result in damage to material property, or impair or interfere with amenities and other legitimate uses of the environment" (Article 2 para. 2 Directive 2008/1/EC).

In the context of permits, Article 8 Directive 2008/1/EC stipulates that "[...] the competent authority shall grant a permit containing conditions guaranteeing that the installation complies with the requirements of this Directive or, if it does not, shall refuse to grant the permit. All permits granted and modified permits must include details of the arrangements made for air, water and land protection as referred to in this Directive."

Conceptual approach: The Directive uses a permitting scheme for installations that make stipulations for operation (e.g., for environmental compliance).

Suitability: The integrated approach to prevent pollution has a more direct effect on the soil than agricultural law because it clearly indicates values for pollutant minimisation.[22] This approach could be useful for upscaling to the international level because it may provide an example of standard setting and pollution limits from different environmental media that could be taken up for more effective or holistic soil protection by national legal systems.

1.1.3.4 Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) - IED

Soil protection against pollution in EU is mostly covered in the Directive on industrial emissions (IED), adopted on November 24, 2010 as a follow up of the IPPC Directive. The IED contains numerous provisions of relevance for the prevention of land degradation. It provides rules for the integrated prevention and control of pollution arising from industrial activities as well as "rules designed to

21 Ibid: "Member State legislation often does address the issue of environmental damage by giving powers to administrative authorities to intervene. This is settled law in civil law countries though common law countries may sometimes require the administrative agency first to obtain an order from a court."

22 Heuser, Irene (2005): The Development of EU Soil Protection Law. In: Strategies, Science and Law for the Conservation of the World Soil Resources, International Workshop, Selfoss, Iceland, September 2005, Rit LBHI nr. AUI Publ. No. 4.

prevent or, where that is not practicable, to reduce emissions into air, water and land and to prevent the generation of waste, in order to achieve a high level of protection of the environment taken as a whole" (Article 1 Directive 2010/75/EU).

Regarding the importance of permits as a means to prevent pollution, it notes that for the purpose of ensuring the prevention and control of pollution "each installation should operate only if it holds a permit or, in the case of certain installations and activities using organic solvents, only if it holds a permit or is registered" (para. 5). Such permits shall not only "include all the measures necessary to achieve a high level of protection of the environment as a whole and to ensure that the installation is operated in accordance with the general principles governing the basic obligations of the operator" but "also include emission limit values for polluting substances, or equivalent parameters or technical measures, appropriate requirements to protect the soil and groundwater and monitoring requirements" (para. 12).

Furthermore, the Directive highlights that "[i]t is necessary to ensure that the operation of an installation does not lead to a deterioration of the quality of soil and groundwater. Permit conditions should, therefore, include appropriate measures to prevent emissions to soil and groundwater and regular surveillance of those measures to avoid leaks, spills, incidents or accidents occurring during the use of equipment and during storage. In order to detect possible soil and groundwater pollution at an early stage and, therefore, to take appropriate corrective measures before the pollution spreads, the monitoring of soil and groundwater for relevant hazardous substances is also necessary. When determining the frequency of monitoring, the type of prevention measures and the extent and occurrence of their surveillance may be considered" (para. 23).

The Directive also addresses what it refers to as "baseline reports" that shall provide an instrument for the monitoring of soil pollution. The Directive notes that "it is necessary to establish, through a baseline report, the state of soil and groundwater contamination" so as "to ensure that the operation of an installation does not deteriorate the quality of soil and groundwater". Furthermore the Directive notes that "[t]he baseline report should be a practical tool that permits, as far as possible, a quantified comparison between the state of the site described in that report and the state of the site upon definitive cessation of activities, in order to ascertain whether a significant increase in pollution of soil or groundwater has taken place. The baseline report should, therefore, contain information making use of existing data on soil and groundwater measurements and historical data related to past uses of the site" (para. 24).

Article 14 Directive 2010/75/EU provides details for permits. Therein it is held that Member States shall ensure that permits includes all measures necessary for compliance with the Directive's requirements and that these measures shall include, inter alia, "appropriate requirements ensuring protection of the soil and groundwater and measures concerning the monitoring and management of waste generated by the installation" and "appropriate requirements for the regular maintenance and surveillance of measures taken to prevent emissions to soil and groundwater pursuant to point (b) and appropriate requirements concerning the periodic monitoring of soil and groundwater in relation to relevant hazardous substances likely to be found on site and having regard to the possibility of soil and groundwater contamination at the site of the installation" (Article 14 para. 1 b) and e) Directive 2010/75/EU).

In view of the baseline report, Article 22 para. 2 Directive 2010/75/EU holds that "where the activity involves the use, production or release of relevant hazardous substances and having regard to the possibility of soil and groundwater contamination at the site of the installation, the operator shall prepare and submit to the competent authority a baseline report before starting operation of an installation or before a permit for an installation is updated for the first time after 7 January 2013." Furthermore, Article 22 para. 2 Directive 2010/75/EU determines in detail which information the

baseline report shall contain. This necessary information includes information needed to determine the state of soil and groundwater contamination and information on the present use and, where available, on past uses of the site.

Article 22 also regulates measures to be taken upon definitive cessation of the activities, addressing therein the restoration of potential damage. According to Article 22 para. 3 Directive 2010/75/EU, "the operator shall assess the state of soil and groundwater contamination by relevant hazardous substances used, produced or released by the installation." Furthermore, "[w]here the installation has caused significant pollution of soil or groundwater by relevant hazardous substances compared to the state established in the baseline report referred to in paragraph 2, the operator shall take the necessary measures to address that pollution so as to return the site to that state. For that purpose, the technical feasibility of such measures may be taken into account." Article 22 para. 4 Directive 2010/75/EU also regulates cases in which an operator is not required to prepare a baseline report. In such cases, an "operator shall, upon definitive cessation of the activities, take the necessary actions aimed at the removal, control, containment or reduction of relevant hazardous substances, so that the site, taking into account its current or approved future use, ceases to pose any significant risk to human health or the environment due to the contamination of soil and groundwater as a result of the permitted activities and taking into account the conditions of the site of the installation established in accordance with Article 12(1)(d)".

Furthermore, Directive 2010/75/EU addresses the prevention of soil pollution in its Articles 46 and 52 in which it is held that "[w]aste incineration plant sites and waste co-incineration plant sites, including associated storage areas for waste, shall be designed and operated in such a way as to prevent the unauthorised and accidental release of any polluting substances into soil, surface water and groundwater" (Article 46 Directive 2010/75/EU) and that "[t]he operator of the waste incineration plant or waste co-incineration plant shall take all necessary precautions concerning the delivery and reception of waste in order to prevent or to limit as far as practicable the pollution of air, soil, surface water and groundwater as well as other negative effects on the environment, odours and noise, and direct risks to human health" (Article 52 Directive 2010/75/EU).

Conceptual approach: The protection of soil from pollution by industrial installations is regulated by the IED Directive. Conceptually, the Directive requires that the operator gets permission for the establishment and operation of the industrial installation. The permission procedure includes an assessment as to whether negative effects on the environment, including soils, can or will be prevented. The legal mechanisms in the Directive to carry this out are a pre-production soil analysis and baseline report, monitoring obligations (soil and groundwater), and post-production remediation/offsetting or restitution of the land to the state it was at the beginning of production if critical pollution limits were exceeded (according to the "polluter-pays principle"). Additionally, a national framework for management of contaminated soils must be established with clear allocation of responsibilities between different ministries and adoption of a legal basis and implementing instruments for soil protection (e.g., site register, accreditation procedure for soil remediation/offsetting experts).

Suitability: The legal approaches and mechanisms used under this Directive provide a useful example for authorising and monitoring polluting installations and requiring remediation/offsetting of harm if a threshold limit is reached (implementation of the polluter-pays principle). The national requirement to allocate clear responsibilities between ministries would potentially be useful for governments that tend to have institutional inefficiency which hinders effective implementation, and the instrument examples would provide a way in which land use and monitoring oversight could be put into place.

1.1.3.5 Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment, EIA Directive

The Directive 2014/52/EU recalls inter alia the Commission's Communication of 22 September 2006 ("Thematic Strategy for Soil Protection"), the Roadmap to a Resource-Efficient Europe and the "final document of the United Nations Conference on Sustainable Development held in Rio de Janeiro on 20-22 June 2012". These documents are held by the Directive to "underline the importance of the sustainable use of soil and the need to address the unsustainable increase of settlement areas over time" and recognise "the economic and social significance of good land management, including soil, and the need for urgent action to reverse land degradation. Public and private projects should therefore consider and limit their impact on land, particularly as regards land take, and on soil, including as regards organic matter, erosion, compaction and sealing; appropriate land use plans and policies at national, regional and local level are also relevant in this regard" (para. 9).

Its Article 3 notes that the assessment of environmental impacts "shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project" on, inter alia, "(c) land, soil, water, air and climate."

Articles 4 and 5 Directive 2014/52/EU provide further details on the requirements of an environmental impact assessment. These Articles are supplemented by information contained in the Annexes, which stipulate in detail the information requirements referred to in Articles 4 and 5 Directive 2014/52/EU. The Annexes contain details of relevance for soil, too.

In Annex II A ("Information referred to in Article 4(4)"[23]) it is held that "[a] description of any likely significant effects, to the extent of the information available on such effects, of the project on the environment resulting from [...] the use of natural resources, in particular soil, land, water and biodiversity."

Annex III ("Selection Criteria referred to in Article 4(3)"[24]) notes that "[t]he characteristics of projects must be considered, with particular regard to", inter alia, "the use of natural resources, in particular land, soil, water and biodiversity". Regarding the location of projects it is noted that "[t]he environmental sensitivity of geographical areas likely to be affected by projects must be considered, with particular regard to: (a) the existing and approved land use; (b) the relative abundance, availability, quality and regenerative capacity of natural resources (including soil, land, water and biodiversity) in the area and its underground."

23 Article 4 para. 4 Directive 2014/52/EU: "Where Member States decide to require a determination for projects listed in Annex II, the developer shall provide information on the characteristics of the project and its likely significant effects on the environment. The detailed list of information to be provided is specified in Annex IIA. The developer shall take into account, where relevant, the available results of other relevant assessments of the effects on the environment carried out pursuant to Union legislation other than this Directive. The developer may also provide a description of any features of the project and/or measures envisaged to avoid or prevent what might otherwise have been significant adverse effects on the environment."

24 Article 4 para. 3 Directive 2014/52/EU: "Where a case-by-case examination is carried out or thresholds or criteria are set for the purpose of paragraph 2, the relevant selection criteria set out in Annex III shall be taken into account. Member States may set thresholds or criteria to determine when projects need not undergo either the determination under paragraphs 4 and 5 or an environmental impact assessment, and/or thresholds or criteria to determine when projects shall in any case be made subject to an environmental impact assessment without undergoing a determination set out under paragraphs 4 and 5."

Annex IV ("Information referred to in Article 5(1)"[25]) determines that the description of the project must include, inter alia, "a description of the main characteristics of the operational phase of the project (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used" and "an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced during the construction and operation phases."

Annex IV also addresses soil degradation threats in para. 4 in which it is held that the description of the project must also include a description of factors likely to be significantly affected by the project, including soil (for example organic matter, erosion, compaction, sealing).

Conceptual approach: The EIA Directive states the "need for urgent action to reverse land degradation. Public and private projects should therefore consider and limit their impact on land, particularly as regards land take, and on soil, including as regards organic matter, erosion, compaction and sealing; appropriate land use plans and policies at national, regional and local level are also relevant in this regard".[26]

The assessment of environmental impacts has to individually "identify, describe and assess in an appropriate manner the direct and indirect significant effects of a project" on, inter alia, "(c) land, soil, water, air and climate" (Art. 3).

The Directive provides further details on the requirements of an environmental impact assessment. The Articles are supplemented by information contained in the Annexes, which stipulate in detail the information requirements referred to in Articles 4 and 5 Directive 2014/52/EU. The Annexes contain details of relevance for soil, too.

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25 Article 5 para. 1 Directive 2014/52/EU: "Where an environmental impact assessment is required, the developer shall prepare and submit an environmental impact assessment report. The information to be provided by the developer shall include at least:

(a) a description of the project comprising information on the site, design, size and other relevant features of the project;

(b) a description of the likely significant effects of the project on the environment;

(c) a description of the features of the project and/or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment;

(d) a description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment;

(e) a non technical summary of the information referred to in points (a) to (d); and

(f) any additional information specified in Annex IV relevant to the specific characteristics of a particular project or type of project and to the environmental features likely to be affected.

Where an opinion is issued pursuant to paragraph 2, the environmental impact assessment report shall be based on that opinion, and include the information that may reasonably be required for reaching a reasoned conclusion on the significant effects of the project on the environment, taking into account current knowledge and methods of assessment. The developer shall, with a view to avoiding duplication of assessments, take into account the available results of other relevant assessments under Union or national legislation, in preparing the environmental impact assessment report."

26 Position of the European Parliament adopted at first reading on 12 March 2014 with a view to the adoption of Directive 2014/.../EU of the European Parliament and of the Council amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment, http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//TEXT+TA+P7-TA-2014-0225+0+DOC+XML+V0//EN, para. 9.

Suitability: Environmental Impact Assessments are excellent tools to include soil protection issues into regional planning and mainstream national laws. However, they are well known in international frameworks and do not have to be outlined here further.

1.1.3.6 Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment – SEA Directive

The EIA often falls short in the context of authorisation procedures and comes too late within planning and decision processes. Therefore a SEA is upstream to fill these shortcomings. The objective of Directive 2001/42/EC "is to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development, by ensuring that, in accordance with this Directive, an environmental assessment is carried out of certain plans and programmes which are likely to have significant effects on the environment" (Article 1 Directive 2001/42/EC).

In its Annex I, it holds that the information referred to in Article 5(1)[27] must include information on "the likely significant effects on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors."

Conceptual approach: The Directive provides support to Member States when assessing and evaluating their plans and programmes which might cause negative effects on the environment, e.g. plans transport services (railways, streets) or energy supply systems. This was very helpful for the old Member States as well as for the new ones, especially while aiming to harmonise their legal systems with European law. The conceptual approach is to include environmental aspects from the early beginning of the planning of operations that can, potentially, have negative effects.

Suitability: The Directive provides overall guidelines for assessment measures and forces stakeholders to integrate environmental aspects into their planning from the very beginning. Although it is tailor-made for EU Member States, it does seem to be a useful tool for an up-scaling of international law.

1.1.3.7 Council Directive of 12 June 1986 on the protection of the environment, and in particular of the soil, when sewage sludge is used in agriculture (86/278/EEC)

The purpose of Directive 86/278/EEC "is to regulate the use of sewage sludge in agriculture in such a way as to prevent harmful effects on soil, vegetation, animals and man, thereby encouraging the correct use of such sewage sludge" (Article 1 Directive 2001/42/EC).

The Directive further "aims at establishing certain initial Community measures in connection with soil protection" and emphasises that "the use of sewage sludge must not impair the quality of the soil and of agricultural products" (cp. Preamble).

Of particular importance in the context of land degradation are the Directive's Articles 5 and 8.

Article 5 Directive 86/278/EEC stipulates that "Member States shall prohibit the use of sludge where the concentration of one or more heavy metals in the soil exceeds the limit values which they lay

27 Article 5 ("Environmental Report") Directive 2001/42/EC: "1. Where an environmental assessment is required under Article 3(1), an environmental report shall be prepared in which the likely significant effects on the environment of implementing the plan or programme, and reasonable alternatives taking into account the objectives and the geographical scope of the plan or programme, are identified, described and evaluated. The information to be given for this purpose is referred to in Annex I."

down in accordance with Annex I A and shall take the necessary steps to ensure that those limit values are not exceeded as a result of the use of sludge" (para. 1). Furthermore, Article 5 Directive 86/278/EEC holds that "Member States shall regulate the use of sludge in such a way that the accumulation of heavy metals in the soil does not lead to the limit values referred to in paragraph 1 being exceeded." To that end, Member States are required to apply one or other of the following procedures:

"(a) Member States shall lay down the maximum quantities of sludge expressed in tonnes of dry matter which may be applied to the soil per unit of area per year while observing the limit values for heavy metal concentration in sludge which they lay down in accordance with Annex I B"; or

"(b) Member States shall ensure observance of the limit values for the quantities of metals introduced into the soil per unit of area and unit of time as set out in Annex I C."

Article 8 Directive 86/278/EEC determines the rules applicable to the use of sludge. Therein it is held that "sludge shall be used in such a way [...] that the quality of the soil and of the surface and ground water is not impaired" and noted that "where sludge is used on soils of which the pH is below 6, Member States shall take into account the increased mobility and availability to the crop of heavy metals and shall, if necessary, reduce the limit values they have laid down in accordance with Annex I A".

The Directive is complemented by the Pesticide and Biocidal Product Regulation (see 1.2.3.8).

Conceptual approach: Of particular importance in the context of land degradation are the Directive's Articles 5 and 8. Article 5 Directive 86/278/EEC deals with the prohibition of "the use of sludge where the concentration of one or more heavy metals in the soil exceeds the limit values" laid down in Annex I A. Additionally, Member States are required to "lay down the maximum quantities of sludge expressed in tonnes of dry matter" or to "ensure observance of the limit values for the quantities of metals introduced into the soil per unit of area and unit of time as set out in Annex I C" (cp. Article 5(2)(a) Directive 86/278/EEC). Article 8 Directive 86/278/EEC determines the rules applicable to the use of sludge.

Suitability: The Directive provides specific regulation on sewage sludge and foresees innovative tools like different types of emission limit values to provide guidance to the Member States. Therefore it can be seen as helpful tool to combat soil degradation.

1.1.3.8 Biocidal Product Regulation (BPR) – Regulation (EU) No. 528/2012.

The new biocide Regulation (which came into effect on 1 September 2013 and which is adapted to REACH[28]) "prohibits the use of active biocidal substances with extremely hazardous profiles in biocidal products".[29] Furthermore, it strengthens "the precautionary principle of preventing adverse effects from hazardous substances." And now also takes environmental properties into account (PBT, vPvB).[30]

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28 Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), European Union regulation dated 18 December 2006 No. 1907/2006 Regulation (EC) No. 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.

29 Smolka, Susanne (2012): The European Union's New Regulation on biocides. PAN Germany (Pesticide Actions-Network e.V.), available online at http://www.pan-germany.org/download/biocides/new_european_regulation_on_biocides.pdf.

30 Ibid.

However, there are extensive derogations, which reduce the effect of the exclusion procedure enshrined by the Regulation.[31] The Directive indicates that "active substances with the worst hazard profiles should not be approved for use in biocidal products except in specific situations. These should include situations when approval is justified because of the negligible risk from exposure to the substance, human health, animal health or environmental reasons or the disproportionate negative impact for society of non-approval. When deciding if such active substances may be approved, the availability of suitable and sufficient alternative substances or technologies should also be taken into account."[32] However, Article 5 Regulation (EU) No 528/2012 also highlights that this is subject to the adoption of "risk-mitigation measures to ensure that exposure of humans, animals and the environment to those active substances is minimised."

Conceptual approach: The BPR's objective is "to improve the functioning of the internal market through the harmonisation of the rules on the making available on the market and the use of biocidal products, whilst ensuring a high level of protection of both human and animal health and the environment" (cp. Article 1 Regulation (EU) No. 528/2012). The Regulation aims to prevent the entry of dangerous substances into the soil and strictly adheres to the precautionary principle.

Suitability: Due to the very precise test values and the taking into account of environmental properties, the Regulation appears suitable for up-scaling. However, it is not directly transferable but could be used as source of ideas. It could be also learned from experiences due to intensive discussions between different stakeholders with regard to derogations.

1.1.3.9 Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste

The overall objective of Directive 1999/31/EC is "to provide for measures, procedures and guidance to prevent or reduce as far as possible negative effects on the environment, in particular the pollution of surface water, groundwater, soil and air, and on the global environment, including the greenhouse effect, as well as any resulting risk to human health, from landfilling of waste, during the whole lifecycle of the landfill" (Article 1 Directive 1999/31/EC).

The Directive emphasises that "it is necessary to indicate clearly the requirements with which landfill sites must comply as regards location, conditioning, management, control, closure and preventive and protective measures to be taken against any threat to the environment in the short as well as in the long-term perspective, and more especially against the pollution of groundwater by leachate infiltration into the soil" (cp. Preamble).

Annex I of Directive 1999/31/EC sets up general requirements for all classes of landfills. Annex I also addresses the protection of soil and notes that "[a] landfill must be situated and designed so as to meet the necessary conditions for preventing pollution of the soil [...]". In addition, Annex I provides details on ways to achieve the protection of, inter alia, soil, and notes that "[p]rotection of soil, groundwater and surface water is to be achieved by the combination of a geological barrier and a bottom liner during the operational/active phase and by the combination of a geological barrier and a top liner during the passive phase/post closure."

Conceptual approach: The Directive covers the very important topic of landfills which directly benefits soil protection. Annex I of the Directive provides details on ways how to achieve the protection of, inter alia, soil, and notes that this can be achieved by the combination of different geological and

31 Ibid.

32 Cp. Regulation (EU) No 528/2012 of the European Parliament and of the Council of 22 May 2012 concerning the making available on the market and use of biocidal products, http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=OJ:L:2012:167:FULL&from=DE, para. 12.

operational measures. Very detailed guidelines are provided. However, non-compliance in several Member States still causes severe problems due to illegal landfills.

Suitability: The Directive provides a comprehensive frame for the specific problem of landfills. Therefore, some aspects could be transferred to international law.

1.1.3.10 Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives

Directive 2008/98/EC "lays down measures to protect the environment and human health by preventing or reducing the adverse impacts of the generation and management of waste and by reducing overall impacts of resource use and improving the efficiency of such use" (Article 1 Directive 2008/98/EC).

Article 13 Directive 2008/98/EC addresses the protection of human health and the environment. It holds that "Member States shall take the necessary measures to ensure that waste management is carried out without endangering human health, without harming the environment and, in particular: (a) without risk to water, air, soil, plants or animals [...]".

Conceptual approach: The Directive meets the need for a specific waste and landfill regulation addressing not only human health but environmental issues as well.

Suitability: Similar to the Landfill Directive it provides a detailed framework to cover specific drivers for land degradation. Although not directly transferable, it provides ideas which could be adopted.

1.1.3.11 Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora

Article 3 Directive 92/43/EEC stipulates that "[a] coherent European ecological network of special areas of conservation shall be set up under the title Natura 2000." "Natura 2000" is the world's largest network of nature reserves; it comprises more than 26,000 onshore areas and covers approximately 17.5% of Europe. However, the network does not establish functioning links connecting the protected areas.[33] Pursuant to Article 3 Directive 92/43/EEC, "[t]his network, composed of sites hosting the natural habitat types listed in Annex I and habitats of the species listed in Annex II, shall enable the natural habitat types and the species' habitats concerned to be maintained or, where appropriate, restored at a favourable conservation status in their natural range." It aims to protect areas that are affected by land degradation and desertification.[34]

Thus, if implemented effectively, it is capable of contributing to preventing the declining of, inter alia, "soil biodiversity, fertility and organism matter content".[35] It provides a strong tool for the reduction of soil contamination, soil erosion and compaction as well as soil sealing. Overall, the aim of the Directive is to ensure that economic activities are compatible with the protection of valuable species and habitats, rather than excluding economic activities altogether.[36]

Conceptual approach: Natura 2000 sites intend to avoid activities that have the potential to seriously disturb species or cause damage to habitats; furthermore, the system aims to foster the adoption of

33 Helmholtz Centre for Environmental Research – UFZ (2014): Natura 2000 could do a great deal more for nature protection, Press release September 3, 2014, http://www.ufz.de/index.php?en=33165.

34 Bowyer, Catherine, Sirini Withana, Ian Fenn, Samuel Bassi, Megan Lewis, Tamsin Cooper, Patricia Benito and Mudgal Shailendra (2009): Land Degradation and Desertification. Study for the European Parliament, Policy Department Economic and Scientific Policy. IP/A/ENVI/ST/2008-23.

35 Ibid.

36 Cp. European Commission (2014): The EU's protected areas – Natura 2000, http://ec.europa.eu/environment/basics/natural-capital/natura2000/index_en.htm.

"positive measures, if necessary, to maintain and restore these habitats and species to improve conservation."[37]

This approach entails a number of advantages. Given that it encourages sustainable forestry, fishing, agriculture and tourism, it provides people living in these areas and relying on these activities with a long-term future.[38]

Due to the inclusion of soil protection into the protection of special areas of conservation, the Habitats Directive is a basis for a comprehensive consideration of all natural components of a natural habitat. Its instruments can show itself a model for soil protection. Environmental damaging projects like streets and new buildings are only allowed in case of overriding public interests. The deterioration principle further supports stronger nature protection than outside the network.

Suitability: The instruments provide an effective approach to combat soil degradation. However, tailor-made for European conditions, it is not directly transferable to international law but could be used as source. However, on international level, the Convention on Biological Diversity provides already a comprehensive tool for the implementation and assessment of protected area networks.

1.1.3.12 2013 CAP Reform, based on Council Regulation (EC) No 1259/1999 of 17 May 1999 establishing common rules for direct support schemes under the common agricultural policy

The 2013 CAP Reform aimed to introduce targeted payments designed to achieve specific objectives and move away from untargeted direct payments. It increased the competitiveness of EU agriculture by introducing new measures and providing more innovation resources for and by limiting the use of export subsidies.[39]

At the same time, however, critics maintain that the reform widened the scope for the re-coupling of direct payments; in addition, it does not prohibit export subsidies and maintains "expenditure on largely untargeted direct payments at the expense of Pillar 2 funding" (Rural Development).[40] Criticism has been raised in view of the adopted greening proposals; they are held to have only limited environmental benefits, due to the measures' shallow nature and numerous exempted farmers.[41]

Nevertheless, there are promising approaches like the requirement to maintain permanent grassland.[42] This is just one greening measure farmers are obliged to fulfil in order to receive special payments in addition to cross-compliance requirements (regulatory measures and good agricultural and environmental conditions (GAECs)) for receiving direct payments.[43] Crop diversification is required as well, and ecological focus areas of 5% of the total area must be maintained on farms above fifteen hectares.[44] The approach is therefore a financial incentive conditioned on direct behaviour control.

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37 Ibid.

38 Ibid.

39 Cp. DG Agriculture and Rural Development (2013): Overview of CAP Reform 2014-2020. Agricultural Policy Perspectives Brief No. 5/Dec. 2013.

40 Matthews, Alan (2014): Prospects for the next CAP reform, http://capreform.eu/prospects-for-the-next-cap-reform/.

41 Ibid

42 European Union (EU) Regulation No 1307/2013 of the European Parliament and of the Council of 17 December 2013 establishing rules for direct payments to farmers under support schemes within the framework of the common agricultural policy and repealing Council Regulation (EC) No 637/2008 and Council Regulation (EC) No 73/2009, Official Journal L 347/608, Article 45.

43 Ibid. at Article 43.

44 Ibid. at Articles 44, 46.

Some Member States (e.g., in Germany as well as at the level of some federal states or "Länder") already imposed a ban on ploughing grasslands. For instance, the German state Baden-Württemberg has limited grassland ploughing until the end of 2015 and afterward will adapt and continue it based on collected experiences.[45]

The GAECs under cross-compliance contain minimum requirements for land management adopted by each Member State, such as erosion prevention, soil quality measures (organic matter conservation and soil structure promotion), and maintenance of land not under agricultural production. These measures are aimed at prevention of land degradation but they are relatively generic in terms of their requirements and stringency. Additionally, farmers who do not receive direct payments are not covered by the GAEC requirements.[46]

Conceptual approach: In light of the existing pressure on natural resources such as soils, it is crucial that agriculture improves its environmental performance with the help of sustainable production methods.[47] Furthermore, farmers need to take mitigation and adaptation measures in order to tackle challenges resulting from climate change; available options are enhancing their resilience to disasters (e.g. flooding, drought or fire).[48]

The aim is to improve sustainability with the help of "the combined and complementary effects of various instruments".[49] This would also benefit soil protection.

Suitability: The CAP reform is tailor-made for the EU and the Member States. The re-coupling of payments and "greening" are hardly transferable to international systems. However, the ideas behind "greening" to support sustainable farming and provide a bunch of measures to farmers to meet the goals, is attractive and could be used as basis for other frameworks. This depends upon the provision of financial incentives conditioned on certain actions and would require some type of monitoring and enforcement to ensure the funds are delivering the public goods at which they are aimed.

1.1.3.13 Draft EU Soil Framework Directive

In addition to the Thematic Soil Strategy, the European Commission introduced a request for a Directive from the European Parliament and the Council establishing a framework for the protection of soil and for the amendment of Directive 2004/35/EC in 2006.[50]

It aimed to lay "down measures for the prevention of soil degradation processes, both occurring naturally and caused by a wide range of human activities, which undermine the capacity of a soil to perform those functions. Such measures include the mitigation of the effects of those processes, and the

45 Schöne, Florian (2010): Situation des Grünlands aus Sicht der Naturschutzverbände, available online at http://www.bfn.de/fileadmin/MDB/documents/ina/vortraege/2009-Gruenland-Schoene.pdf.

46 European Union Regulation No 1306/2013 of the European Parliament and of the Council of 17 December 2013 on the financing, management and monitoring of the common agricultural policy and repealing Council Regulations (EEC) No 352/78, (EC) No 165/94, (EC) No 2799/98, (EC) No 814/2000, (EC) No 1290/2005 and (EC) No 485/2008, Official Journal L 347/549, Article 93.

47 European Commission (2011): the European Commission proposes a new partnership between Europe and the farmers, Press Release 12 October 2011, http://europa.eu/rapid/press-release_IP-11-1181_en.htm.

48 Cp. DG Agriculture and Rural Development (2013): Overview of CAP Reform 2014-2020. Agricultural Policy Perspectives Brief No. 5/Dec. 2013.

49 Ibid.

50 Flemish Port Commission (2012): SFD – Soil Framework Directive, http://www.vlaamsehavencommissie.be/en/vhc/page/sfd-soil-framework-directive.

restoration and remediation/offsetting of degraded soils to a level of functionality consistent at least with the current and approved future use" (cp. Article 1 of the Proposal[51]).

Overall, important elements of the proposal were, for example, to achieve a common framework for soil protection, based on "the principles of the preservation of soil functions, prevention of soil degradation, reduction of the effects of soil degradation; rehabilitation of degraded soils and integration in other sectoral policies" and for the establishment, description and assessment of certain sectoral policy orientations' impacts on soil degradation processes.[52]

In addition, it entailed rules for land owners, obliging them to take precautionary measures in case there is a risk that certain measures are capable of significantly impeding the soil's normal function, mapped areas of risk to certain soil threats and stipulated the adoption of national action programmes examining the size of the threatened areas.[53]

Conceptual approach: The Directive was meant to close gaps in the EU's legal framework for soil protection. In a comprehensive approach, measures and instruments were presented to help coordinate action for protection and improvement of soils across the EU. For example, the installation of a system to identify risk areas of erosion, organic matter decline, compaction, salinisation and landslides (Art. 6) was meant to establish a baseline for Member States in order to put in place programmes of measures.

Conceptually, the draft Directive was a planning instrument which could have also been used to contribute to the LDNW target. States would have had to establish a planning instrument identifying the main drivers of land degradation. Based on that, programmes would have needed to be agreed in order to reduce land degradation and to offset unavoidable harm.

However, a group of Member States rejected the draft, i.a. due to a possible large administrative effort, so the Soil Thematic Strategy remains the primary instrument directly addressing soil protection within the EU legislative framework.

Suitability: The draft Directive provided a variety of attractive ideas to support soil protection throughout the EU, which encompasses multiple different soil types, climates, and conditions. Although not directly transferable, it can be seen as pool of transferable instruments, such as the identification of high-risk areas.

1.1.4 Introduction to Germany

Out of Germany's territorial surface, covering in total more than 357,000 square kilometres, approximately 53% are used for agriculture, 31% are covered by woods and forests and almost 3% comprise the large open-cast mines in the north-eastern part of North Rhine Westphalia and in the new German federal states [updated in 2013].[54] Almost 13% of the land of the Federal Republic is used as so-

51 Proposal for a Directive of the European Parliament and of the Council establishing a framework for the protection of soil and amending Directive 2004/35/EC, http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52006PC0232.

52 Flemish Port Commission (2012): SFD – Soil Framework Directive, http://www.vlaamsehavencommissie.be/en/vhc/page/sfd-soil-framework-directive.

53 Flemish Port Commission (2012): SFD – Soil Framework Directive, http://www.vlaamsehavencommissie.be/en/vhc/page/sfd-soil-framework-directive; for further legal elements of the Proposal see Proposal for a Directive of the European Parliament and of the Council establishing a framework for the protection of soil and amending Directive 2004/35/EC, http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52006PC0232, para. 305.

54 Wiggering, H. et al. (2009): Flächenverbrauch einschränken – jetzt handeln. Empfehlungen der Kommission Bodenschutz beim Umweltbundesamt. Available at http://www.umweltbundesamt.de/sites/default/files/medien/479/publikationen/e6e82d01.pdf.

called settlement and transportation areas.[55] Between 2008 and 2011, the settlement and transportation area grew by 2.5% or 1182 square kilometres to 15%.[56] This translates into approximately 81 hectares of growth per day.[57] After all, the increase slowed down: from 2007 to 2010, only 87 hectares per day were rededicated.[58]

The Federal Government therefore adopted the following goal: by the year 2020, land used for housing and transportation should be reduced by 30 hectares per day.[59] While statistics showed reduced growth of the housing and transportation area at the beginning of this millennium, recently there has been continuously high levels of land consolidation and even reversal in some federal states, i.e. accelerated growth of the housing and transportation areas.[60]

This is occurring despite stagnating and regionally dwindling demographic figures in Germany. Every additional expansion of the housing areas in view of a shrinking population indicates that many areas and soils, which were once used for human dwelling, are abandoned after use or consumption.[61] As a practically discarded resource, they become wasteland and are not used adequately anymore.[62]

1.1.5 Legal system

The German legal system is based on civil law. Unlike common law systems, it relies on a broad set of laws. The federal system of the Federal Republic of Germany establishes shared competencies between the State and its federal states ("Länder"). The German Bundestag is the national Parliament of the Federal Republic of Germany. Compared to other Member States' parliaments, it is a very powerful legislative body.63 It is the only directly elected institution at federal level with a high level of autonomy.[64] In addition, the "Länder" can participate through the German Bundesrat in legislation, administration and matters related to the European Union. However, it has been criticised that the transfer of domestic competencies weakens the impact *ex ante* of the Bundestag on the contents of all legislative acts.[65]

Regulations concerning the protection of soils are embedded in a variety of laws and extra-legal rules (see Table 3).

55 Ibid.

56 Deutschland versiegelt seine FlächenTäglich werden 81 Hektar bebaut, 17 January 2013, http://www.n-tv.de/panorama/Taeglich-werden-81-Hektar-bebaut-article9963401.html.

57 Ibid.

58 Ibid.

59 Wiggering, H. et al. (2009): Flächenverbrauch einschränken – jetzt handeln. Empfehlungen der Kommission Bodenschutz beim Umweltbundesamt. Available at http://www.umweltbundesamt.de/sites/default/files/medien/479/publikationen/e6e82d01.pdf.

60 Ibid.

61 Ibid.

62 Ibid.

63 Gemeinsames Dokumentations- und Informationssystem von Bundestag und Bundesrat, http://dip21.bundestag.de/dip21.web/br.

64 Holzacker, Ronald and Erik Albaek (eds.) (2007): Democratic Governance and European Integration. Linking Societal and State Processes. E. Elgar Publishing Massachusetts.

65 Ibid.

Table 3: Soil Protection in Legal Regulations

Soil Protection	Legal Grounds	Focus
Natural functions of the soil	Soil Protection Law	Conservation/restoration
Consumption	Construction and Planning Law	Widespread soil protection
Prevention of adverse effects on the soil functions	Nature Conservation Law	Prevention/compensation of significant impairment of the ecosystem
Use of goods, compensation of impairments of the ecosystem	Spatial Planning Law	Protection and development of nature and landscape, inter alia soil, ecosystem

Soil protecting norms against consumption of land and open fields can be found in the Federal Building Law (Baugesetzbuch, BauGB)[66], in the Spatial Planning Law (Raumordnungsgesetz, ROG)[67] as well as in the Federal Nature Conservation Act (Bundesnaturschutzgesetz, BNatSchG)[68]. The Construction Planning Law (Bauplanungsrecht), for example, contains a series of relevant norms: the soil protection clause of § 1a para. 2 BauGB emphasises the protection of soils, in addition § 1 para. 6 No. 7 BauGB requires that the effects on the soil be studied for the elaboration of urban development plans and § 35 para. 3 No. 5 BauGB provides for an impairment of public interests if a construction project compromises matters of soil protection. For other political plans, such as urban development outlines, structural plans etc., this is not mandatory though. Other policy areas, in contrast, take into account the effects of an action on the soil quality only in the context of the environmental compatibility test (see § 3 para. 1a UVPG). Different expert groups such as the soil protection commission of the UBA have already proposed a series of possibilities, e.g. priority rules, registry of vacant lots or land recycling, in order to ensure improved promotion of unsealing and renaturation.[69]

Also the Federal Nature Conservation Act provides for soil protection (see §§ 1 para. 1 No. 2, para. 3 No. 2, 7 para. 1 No. 2 BNatSchG). By means of the intervention rule according to § 13 of the Federal Nature Conservation Act (BNatSchG) or through landscape management, damage to the soil should be prevented and/or compensated. Moreover, the regulations of good professional practice were also integrated in § 5 para. and 5 BNatSchG. Beyond these general regulations, protected areas and flora-fauna habitat (FFH) areas can be designated according to § 32 BNatSchG.

Due to the fact that soil protection is mostly part of the field of competence of the federal states, state (“Länder”) laws also provide for legal instruments for regeneration or remediation/offsetting of soils.

1.1.6 Important laws

Below is Table 4 indicating the land degradation categories to which each relevant law identified in the EU/Germany case study applies.

66 BGB. I p. 2141.

67 BGBl. I p. 2081.

68 BGBl. I p. 2994.

69 Wiggering, H. et al. (2009): Flächenverbrauch einschränken – jetzt handeln. Empfehlungen der Kommission Bodenschutz beim Umweltbundesamt. Available at http://www.umweltbundesamt.de/sites/default/files/medien/479/publikationen/e6e82d01.pdf.

Table 4: Matrix of German laws by category and soil threat

Case Study	Laws	Prevention	Remedia-tion/offsetting / Offsetting	Plan-ning	Threats
Germany	Federal Soil Protection Act	(X)[70]	X	X	Erosion, sealing, contamination
	Law on Fertilisers and Plant Conservation	X	X		Contamination
	Federal Nature Conservation Act	X		X	Erosion
	Building Law	X		X	Erosion, sealing, compaction
	Spatial Planning Law			X	Sealing, compaction
	Federal Forest Law	X		X	Erosion, compaction
	Soft law of the Länder	X	X	X	Sealing, erosion, contamination
	Soft law (strategies, concepts)	X		X	Sealing, contamination, erosion

70 (X) indicates that the law only weakly covers this aspect of land degradation prevention, remediation/offsetting, or planning.

1.1.6.1 Bundes-Bodenschutzgesetz - BBodSchG

The **Federal Soil Protection Act** of 1998 aims to protect all functions of the soil. It addresses the protection of soil from erosion and sealing. However, its main focus is on the protection of soil against harmful changes and on measures to rehabilitate contaminated sites.[71] The uniform requirements nationwide shall build the basis for an efficient approach of the administration. At the same time it provides legal certainty which is a pre-condition for future investments by businesses.

In the German legal system, the regulatory areas mentioned in § 3 para. 1 Figures 1-11 of the Federal Soil Protection Law (Bundes-Bodenschutzgesetz, BBodSchG) are generally only applied if the respective sectorial legislation does not contain any soil-related provisions. Priority is given, for example, to the regulations of the Recycling and Waste Law (Kreislaufwirtschafts- und Abfallgesetz), the provisions about transportation of dangerous goods, the regulations of the Law on Fertilisers and Plant Conservation (Düngemittel- und Pflanzenschutzrecht) as well as of the Genetic Engineering Law (Gentechnikgesetz). In the context of this analysis, only substantially autonomous legal instruments are discussed.

According to § 7 BBodSchG, “[p]recautionary measures shall be required if there is concern that harmful soil changes could occur as a result of the spatial, long-term or complex impacts of a use on the soil`s functions”.According to § 9 BBodSchVO, the emergence of harmful soil alterations generally becomes a matter of concern if, on the one hand, pollutant contents are detected in the soil that exceed the precautionary levels according to Annex 2 No. 4, or if there is a substantial concentration of other pollutants which are particularly qualified to cause harmful soil alterations due to their carcinogenic, mutagenic, repro-toxic or poisonous properties. Therefore, the term shall be interpreted in an objectively abstract manner in national law; the suitability to cause an alteration of the soil composition is sufficient; an actual alteration of the soil composition is not required.[72]

However, the BBodSchG (and specified here in § 7 BBodSchG via § 9 read in conjunction with Annex 2 BBodSchG) does not require preventive measures with regard to the non-material effects even though there can be an impairment of the soil function due to capping and densification.

§ 17 BBodSchG and the principles of good agricultural practice meet the requirement of taking precautions in accordance with § 7 BBodSchG. This does not entail an enforceable compliance obligation. Due to the very generic formulations and lacking specificity, the principles shall be understood as mere guidelines and, apart from this, only apply with regard to agricultural use of the soil. In addition, there is no authority to issue orders. Therefore, non-compliance with consultation proposals provided by special federal consulting offices do not cause implementation by administrative force.

§ 4 BBodSchG provides for obligations and requirements to prevent risks while § 13 BBodSchG provides for obligations with regard to remediation/offsetting. In addition, reference is made to §§ 5, 6 BBodSchVO. Remediation according to § 2 para. 7 No. 3 BBodSchG shall include, besides decontamination measures and precautionary measures, also such measures “that eliminate or reduce harmful changes in the soil`s physical, chemical or biological characteristics.”

According to § 4 para. 3 BBodSchG, a “party who caused a harmful soil change or a contaminated site, and his universal successor, as well as the relevant property owner and the occupant of the relevant real property, shall be obligated to remediate the soil and contaminated sites, and any water

71 Cp. Wunder, Stephanie, Leonardo Mazza and Ana Faria Lopes (2013): Reducing land sealing in Germany. DYNAMIX Policy mix evaluation, http://dynamix-project.eu/results.

72 Stein, Verena (2008): Die Bodenschutzrahmenrichtlinie und die Auswirkungen auf das deutsche Recht, Berliner Wissenschaftsverlag, Lüneburger Schriften zum Umwelt- und Energierecht, Band 14.

pollution caused by harmful soil changes or contaminated sites, in such a manner that no hazards, considerable disadvantages or considerable nuisances for individuals or the general public occur in the long term.”[73] By mentioning the substantial disadvantages and significant nuisances besides the notion of risk, it becomes clear that also impairments below the risk threshold can lead to the emergence of a decontamination duty[74]. Besides, § 13 BBodSchG contains the authorisation to order administrative actions in case of “complex” decontamination of hazardous sites. Required are decontamination examinations and a decontamination plan. As the provision is a recommendation, commitment of the administration is intended, i.e. the administrative discretion is limited. The administration may only take different actions in exceptional cases and if there is an opposing reason of greater importance.

Quite broad is the definition of the person who has caused the problem and is in charge to remedy. Aside the persons who are causing contamination also owners and their legal successors are listed in § 4 para. 3 and § 4 para. 6. Also vicarious liability is mentioned to avoid transformation of contaminated sites to legal persons without sufficient capital. The law does not regulate who has to be selected in case of several persons responsible for remediation. There is no priority given to the person causing contamination. Instead, the common principle of effective fault elimination applies.[75] Thus, the person has to be selected who is in the best position to eliminate the disturbing situation quick and effective. In many cases the person who owns the site without having contaminated it will be responsible. Administration tends to this procedure because the causing person is often difficult to find or not existent in cases long time ago. However, the liability for those owners is limited to the current market value of the site.[76]

Test values and measure values provide enforcement assistance. The BBodSchV determines test values for different paths such as soil – groundwater. In case these values are exceeded, measures need to be taken to examine and/or remedy an occurred harmful soil alteration. More precisely, this shall include detailed examinations in case of exceeded test values and decontamination measures if the measure values were not reached, which can cause significant costs.

The fact that this assessment concept designed for hazardous sites has also become a valid precautionary approach is positive. That way, these test values are applied to assess the groundwater risk potential of recycling materials or construction products.

The intended standardization of the enforcement actions through the establishment of uniform assessment criteria by the BBodSchV has though not yet been achieved as a whole.

Conceptual approach: The main focus of the Federal Soil Protection Act is on remediation rather that risk prevention. Harmful changes in soil possibly causing a danger for individuals or the society are to be repelled or eliminated. Therefore, a regulatory approach is followed. Especially a very detailed structuring of the decision process regarding brownfield rehabilitation is followed.

Precautionary actions are generally not required. To concretise the level of danger, test values and measure values have been developed. When exceeded, an examination has to be conducted or direct measures shall be adopted.

73 Federal Soil Protection Act (17 March 1998), http://www.elaw.org/node/1469.

74 Giesberts, Ludger and Juliane Hilf (2013): Beck'scher Online-Kommentar Umweltrecht, 2013, point 20.

75 Schotten, Thomas, Alexandra Fridrich and Till Bannasch (2009): Sanierung von Altlasten. Fachinfo,http://www.sfb-rae.de/fileadmin/user_upload/download/Sanierung_von_Altlasten.pdf.

76 BVerfG, 16.02.2000, 1 BvR 315/99.

Contaminated sites are not limited to commercial or industrial used sites and include privately used sites as well. There is no temporal limitation. As a result, sites used today can still be contaminated sites in the sense of the Soil Protection Act.[77] Therefore it is also applicable to damages caused before the law entered into force. Besides contaminated sites, suspect sites and suspected hazardous waste sites are possible. Quite innovative is the liability of property owners for sites contaminated even before he got owner. Due to practical facts there is no distinction between the person causing contamination, owning the site or being legal successor. This procedure shall ensure an uncomplicated, effective remediation. Limits of liability are provided.

The law stipulates in § 17 ("Good Agricultural Practice") certain general standards for the protection of soils with respect to agriculture. However, since competent authorities are not allowed to enforce these standards, § 17 does not have an actual effect on agriculture in practice. There is an ongoing debate whether and how this could be modified in order to realise a better perception of soil needs.

Suitability: In spite of the subsidiarity of the law in the national context, the principle of risk prevention and remediation/offsetting is transferable and of interest for international frameworks.

The law's approach to environmental protection is technically orientated; it sets limits for allowable contaminant concentrations. However, the remediation/offsetting obligation did not substantially improve regeneration activities. Furthermore, "the protection of neighbouring property against negative impacts make the industrial reuse of former industrial brownfields very difficult" and contributes to "further suburbanisation of business and industrial land uses".[78]

1.1.6.2 Sectorial laws: soil-protecting provisions against contamination through pollutants

Law on Fertilisers and Plant Conservation (Düngemittel- und Pflanzenschutzrecht – DMG, BGBl. I) p. 2134, amended 1994

The Law on Fertilisers ("Düngemittelrecht") comprises particularly the Fertilising Law ("Düngegesetz") and the Fertiliser ("Düngeverordnung", DüV).[79] The Soil Protection Law is subsidiarily applicable in accordance with § 3 para. 1 No. 4 BBodSchG. This means that the use of fertilisers and plant protection agents is not covered by the BBodSchG to the extent where it concerns the regulation of effects on the soil. The BBodSchG, in contrast, is also applied in these areas if and as long as the effects on the soil are not regulated by these provisions, e.g. for troubleshooting in case of faulty use of the fertilisers.

A precautionary principle can potentially be seen in the Law on Fertilisers:

According to § 1, the purpose of the Fertilising Law is, inter alia, to conserve fertility of the soil, especially to conserve or sustainably improve the humus content typical for the respective location and use.[80] In addition, it contains soil-protecting regulations: §§ 2, 3 DüngG provide for requirements defined for the use of fertilisers. Furthermore, § 5 DüngG regulates that substances that are not named "EC fertilisers" may only be put on the market as long as they are "appropriate [...] to conserve

77 Hoppe, Werner, Martin Beckmann and Petra Kauch (2000): Umweltrecht, 2nd edition, C.H. Beck Verlag.

78 Vanheusden, Bernard (2006): The sustainability of brownfield redevelopment incentives, In: Strategies, Science and Law for the Conservation of the World Soil Resources, International Workshop, Selfoss, Iceland, September 2005, Rit LBHI nr. AUI Publ. No. 4; cp. also Thornton, Gareth, Martin Franz, David Edwards, Gernot Pahlen and Paul Nathanail (2007): The Challenge of Sustainability: incentives for brownfield regeneration in Europe, Environmental Science and Policy, Volume 10, Issue 2, April 2007, pp. 116 – 134.

79 Ordinance on the use of fertilisers, soil additives, growing media and plant aids according to the good professional practice of fertilising.

80 Bundesministerium der Justiz und für Verbraucherschutz, Section 5 Inverkehrbringen, http://www.gesetze-im-internet.de/d_ngg/__5.html.

or sustainably improve the fertility of the soil, especially the humus content typical for the respective location and use, and as long as they do not harm human and animal health during competent use and as long as they do not endanger the ecosystem."[81] The Fertiliser Ordinance (DüV) regulates, according to § 1, the good professional practice concerning the use of fertilisers, soil additives, growing media and plant aids on agriculturally used areas and on other areas as long as it is expressly regulated by this ordinance.[82]

Conceptual approach: The aim of the law is to achieve a "minimum required storage capacity for livestock manure, the limitation of land application of fertilisers and land application near waters or on slopes".[83] It is therefore dealing with the specific problem of eutrophication of landscapes and their soils by the agricultural sector and provides specific answers.

Suitability: The law provides very detailed standards, guidelines and measures and presents a source of transferable solutions although not directly compatible with the international legal system.

1.1.6.3 Sectorial laws: Soil protecting law against land take and site consumption – Regulatory and planning instruments

Soil protection is generally an important aim of each decision about planning and admission. Aside the Building Law (BauGB) other laws are important within urban and land-use planning which underlines the cross-cutting position of soil protection.[84]

The German planning system is rather complex. This follows from the fact that several instruments exist; in addition, there are complex interlinkages between the federal, state, regional and the local/municipal level[85].

There are four planning levels in Germany (municipal, the regional, the federal state and the federal level).[86] The Spatial Planning Act ("Raumordnungsgesetz") establishes a framework for spatial order and planning, which the federal states make operational through their respective federal state level planning. Additional planning regions in the federal states are in charge of working out regional plans with guidelines for the structure of the regional planning. The municipal level takes these guidelines into consideration.[87]

81 Ibid.

82 Bundesministerium der Justiz und für Verbraucherschutz, Section 1 Geltungsbereich, http://www.gesetze-im-internet.de/d_v/__1.html.

83 Report from the Commission to the Council and the European Parliament on the implementation of Council Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources based on Member State reports for the period 2008–2011, http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52013DC0683, para. 5.

84 Kluth, Winfried and Ulrich Smeddinck (eds.) (2013): Umweltrecht: Ein Lehrbuch; Springer Spektrum.

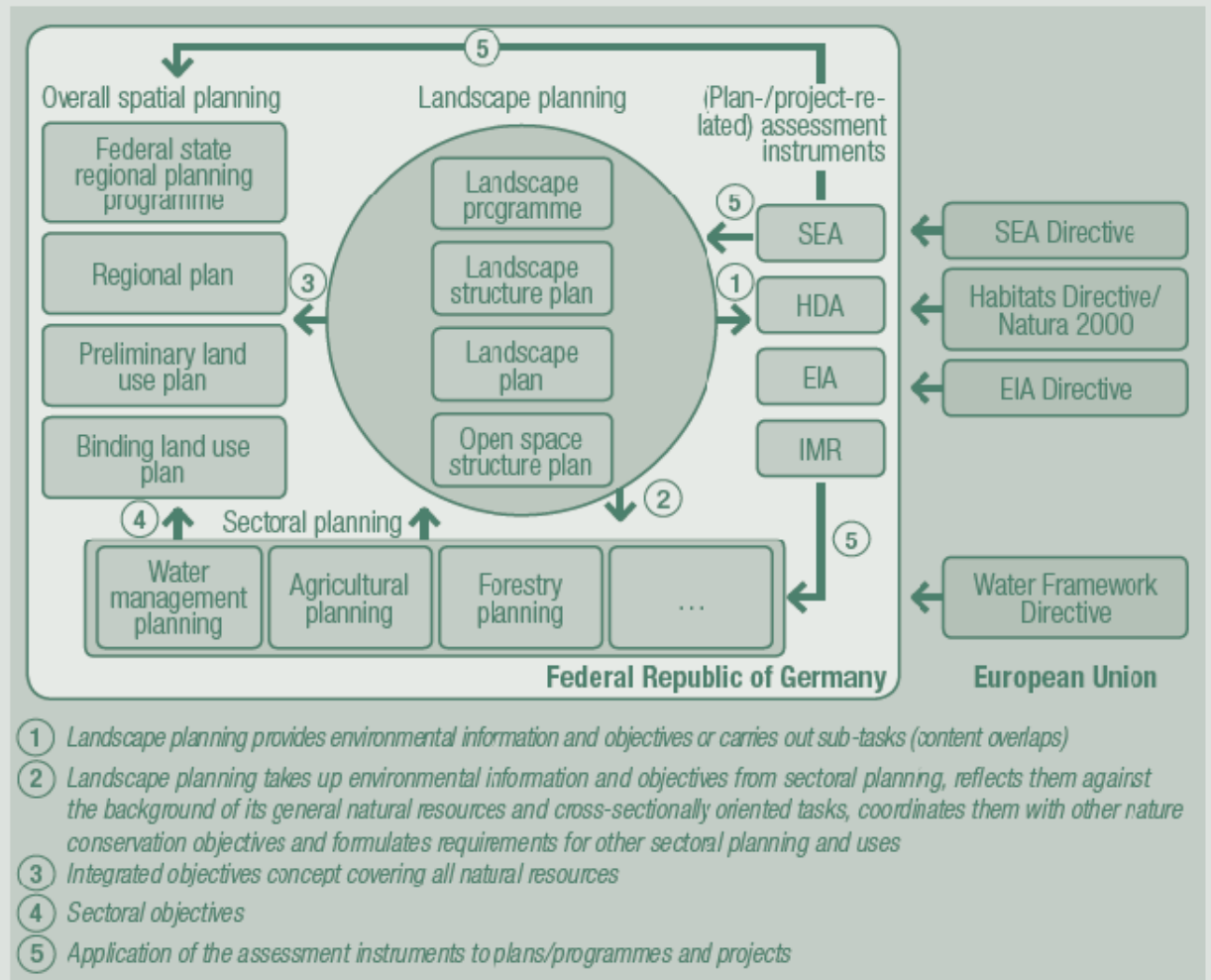
85 Wunder, Stephanie, Leonardo Mazza and Ana Faria Lopes (2013): Reducing land sealing in Germany. DYNAMIX Policy mix evaluation, http://dynamix-project.eu/results.

86 Wunder, Stephanie, Leonardo Mazza and Ana Faria Lopes (2013): Reducing land sealing in Germany. DYNAMIX Policy mix evaluation, http://dynamix-project.eu/results.

87 Malburg-Graf, Barbara, Angelika Jany, Metke Lilienthal and Frank Ulmer (2007): Strategies and instruments to limit excessive land use in Germany - a proposal to the German Council for Sustainable Development. Proceedings 2nd International Conference on Managing Urban Land; Wunder, Stephanie, Leonardo Mazza and Ana Faria Lopes (2013): Reducing land sealing in Germany. DYNAMIX Policy mix evaluation, http://dynamix-project.eu/results.

Landscape planning complements the overall spatial planning process and comprehensively addresses environmental issues (cp. for details Figure 1 below).[88]

Figure 1: Position of landscape planning in the German planning system



Abbreviations: SEA: Strategic Environmental Assessment, HDA: Habitats Directive Assessment, EIA: Environmental Impact Assessment, IMR: Impact Mitigation Regulation

1.1.6.3.1. The Federal Nature Conservation Act

The Federal Nature Conservation Act also serves the protection of the soil (see § 1 para. 1 No. 2, § 1 para. 3 No. 2, § 7 para. 1 No. 2 BNatSchG). By means of the intervention rule according to § 13 BNatSchG or landscape development, impairments of the soil shall be avoided and/or compensated. Since 1976, the Federal Nature Conservation Act has established landscape planning as a central planning instrument of prevention oriented nature conservation and describes the core objectives

88 Haaren, Christina v., Carolin Galler and Stefan Ott (2008): Landscape planning. The basis of sustainable landscape development. Published by the Bundesamt für Naturschutz, Bonn, http://www.umwelt.unihannover.de/haaren.html?&no_cache=1&tx_tkinstpersonen_pi1[showUid]=75&tx_tkinstpersonen_pi1[publikationen]=1; cp. Wunder, Stephanie, Leonardo Mazza and Ana Faria Lopes (2013): Reducing land sealing in Germany. DYNAMIX Policy mix evaluation, http://dynamix-project.eu/results.

and tasks[89] (§9 BNatSchG).[90] According to § 9(1) BNatSchG, "[t]he tasks of landscape planning shall include specifying the purposes of nature conservation and landscape management, for the respective planning area, and identifying applicable requirements and measures for achieving such purposes [...]."[91]

Information (e.g. on soils, bodies of water, air and climate) can "inform planning processes, e.g. to guide the location of traffic and settlement areas and other projects (or even prevent/reduce these developments)."[92]

Beyond these general regulations, protected areas and FFH (flora-fauna habitat) areas can be defined in accordance with § 32 BNatSchG. Hence, the relationship between the soil protection law and the law on the protection of nature is significant. Both fields of legislation are applicable in parallel; unlike in § 3 BBodSchG, no subsidiarity was legally prescribed. Areas of risk are not restricted by the possibilities for definition of protected areas according to the Federal Nature Conservation Act (§ 20 ff. BNatSchG).93 However, the instruments can overlap or complement each other; if, based on this, areas with soils that are worthy of protection overlap with already designated areas protected by law, there will usually be no more need for a special protected area designation under soil protection law. This leads to a factual – not legal – subsidiarity. In practice, however, it was often pointed out that, for example, the share of grassland in the EU bird reserves had dropped by 31 percent in the past twelve years.94 The change has direct soil-damaging effects and also progresses massively in FFH areas these days.95 In this respect, discussions shall be held among nature protection professionals about the extent to which, for example, FFH areas can guarantee effective soil protection.

Also, the instrument of the eco-account, which is based on the legal provisions of §§ 16 and 18 to 21 of BNatSchG as well as § 200a of BauGB is provided. Eco-accounts are a mechanism which local authorities can use to mitigate for land degradation by holding a reserve of compensatory sites.96 Compensation and replacement measures are also documented and can be entered into an area registry. The areas will be available for unavoidable damage to nature and landscapes.

89 Ibid: "Since 2002 the Federal Nature Conservation Act also contains more instruments to improve sustainable land use and reduce the pressure on habitats, e.g. through provisions on wildlife corridors, green belts etc ("Biotopverbund")."

90 Ibid: "After its amendments in 2002 and 2010 the Federal Nature Conservation Act was again strengthened to reduce land take, protect habitats and support land recycling."

91 Cp. §9(1) Act on Nature Conservation and Landscape Management (Federal Nature Conservation Act – BNatSchG) of 29 July 2009, unofficial translation, Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, http://www.eui.eu/Projects/InternationalArtHeritageLaw/Documents/NationalLegislation/Germany/federalnaturecon servationact.pdf.

92 Wunder, Stephanie, Leonardo Mazza and Ana Faria Lopes (2013): Reducing land sealing in Germany. DYNAMIX Policy mix evaluation, http://dynamix-project.eu/results: "For example in many regions landscape planning instruments/ plans define suitable areas for wind power parks ("Eignungsgebiete")".

93 Ministerium für Klimaschutz, Umwelt, Landwirtschaft, Natur- und Verbraucherschutz des Landes Nordrhein-Westfalen, http://www.umwelt.nrw.de/.

94 http://www.nabu.de/themen/naturschutz/eunaturschutz/schutzgebiete/natura2000/14866.html.

95 NABU (2012): Defizitanalyse Natura 2000, Situation von artenreichem Grünland im süddeutschen Raum, http://www.nabu.de/imperia/md/content/nabude/landwirtschaft/gruenland/nabu_gr__nlandstudie.pdf.

96 The Baltic Spatial Conceptshare, BSR INTERREG III B project „Promoting Spatial Development by Creating COMmon MINdscapes – COMMIN", National Glossary Germany, http://commin.org/upload/Glossaries/National_Glossaries/COMMIN_German_Glossary.pdf.

Conceptual approach: The law follows a comprehensive approach to protect nature. Its instruments are planning instruments, instruments to control behaviour directly ("Eingriffsregelung"), and instruments to control behaviour indirectly ("Flächen- und Biotopschutz").[97]

The Federal Nature Conservation Act demands the avoidance and compensation of severe impacts of ecosystems. Generally negative effects on the ecosystems have to be avoided if it is proven that they are unavoidable which in reality is the case. Importantly, in this case the negative effects have to be offset and compensated. The provision is seen as one of the most crucial provision of German environmental law.

The law further provides a standardised evaluation scheme of impacts which has been further outlined in several regulations of the "Länder", e.g. in the frame of eco-account regulations. Another new aspect is the approach to protect particularly sensitive soils within protected areas. Standards for the agricultural sector are outlined as well providing guidance with regard to Codes of Good Practices.

Suitability: The law provides a variety of approaches and instruments such as the eco-account regulations to protect soils, which could be applied step-wise to international law regimes. However, the quite complex German law system differs strongly from the international frameworks.

1.1.6.3.2. Federal Building Law – BauGB, BGBl. I S. 2141

The Federal Building Law ("Baugesetzbuch") regulates local land use planning. The local planning autonomy ("kommunale Planungshoheit") is enshrined in Article 28 of the German Basic Law ("Grundgesetz").[98]

The Federal Building Law has a soil conservation section and refers to the Federal Nature Conservation Act (BNatSchG).[99] The Federal Nature Conservation Act requires the legally binding compensation of environmental impacts caused by building measures ("Eingriffsregelung").[100] This Impact Mitigation Regulation (IMR) ("Eingriffsregelung") aims to avoid and minimise environmental impacts; impacts that are not avoidable shall be compensated. In fact, it is very important that the authorities in charge have to think about compensation already while deciding upon the future local planning within municipalities.

In 2004, after the adoption of the European Law Adaptation Act for the Construction Sector ("Europarechtsanpassungsgesetz Bau"), the Federal Building Law implemented requirements for strategic environmental assessments in accordance with Directive 2001/42/EC on the assessment of

97 Erbguth, Wilfried and Sabine Schlacke (2010): Umweltrecht, 3rd edition, Nomos Verlag.

98 Cp. Article 28(2) Basic Law: "Municipalities must be guaranteed the right to regulate all local affairs on their own responsibility, within the limits prescribed by the laws. Within the limits of their functions designated by a law, associations of municipalities shall also have the right of self-government according to the laws. The guarantee of self-government shall extend to the bases of financial autonomy; these bases shall include the right of municipalities to a source of tax revenues based upon economic ability and the right to establish the rates at which these sources shall be taxed.", Deutscher Bundestag, Basic Law for the Federal Republic of Germany, print version (October 2010).

99 Cp. Section 202 and, for example, Section 1a(2), Section 29 and 243(2).

100 Malburg-Graf, Barbara, Angelika Jany, Metke Lilienthal and Frank Ulmer (2007): Strategies and instruments to limit excessive land use in Germany - a proposal to the German Council for Sustainable Development. Proceedings 2nd International Conference on Managing Urban Land; Wunder, Stephanie, Leonardo Mazza and Ana Faria Lopes (2013): Reducing land sealing in Germany. DYNAMIX Policy mix evaluation, http://dynamix-project.eu/results.

the effects of certain plans and programmes on the environment (Strategic Environmental Assessment Directive[101]).

The Federal Building Law was amended again in 2013.[102] This amendment supports the recycling of sites and is directly linked to Art. 15 para. 3 of the Federal Nature Conservation Act to avoid land take of forestry and agricultural sites as far as possible.

Conceptual approach:

- Soil Protection Clause
- Extensive Soil Protection
- Testing of the compatibility with soil fertility
- EIA and impact mitigation regulation which demands the offset of negative effects
- Temporarily limits for the permission of building plans
- City centre development

Suitability: Several aspects of the building law may serve as example for international soil protection laws. Mainly the strong connection to nature conservation law with its impact mitigation regulation is worth being transferred to other legal systems. Also the strong promotion of the development of city centres shows convincing results and could be used as a model for other regions.

1.1.6.3.3. Spatial Planning Law – ROG, BGBl. I S. 2081

Along with common baselines for spatial planning, the functioning of soils has to be ensured. In § 2 para. 2 No. 6 ROG it says: "With respect to the functionality of soils [...] the space has to be developed, protected or as far as necessary, possible and adequate, to be restored." Risk areas are normally important for spaces according to § 3 No. 6 ROG. It is therefore very relevant to consider the aims of the spatial planning law and to ensure the framework and other requirements of the law when defining risk areas.[103]

Conceptual approach: The law mainly targets the protection and development of nature and landscapes including soil and ecosystems. The principles of spatial planning support the reduction of land and site consumption due to its estimations and discretionary decisions (§ 3 No. 3 ROG).

Suitability: The law can be seen as excellent theoretical basis for spatial planning. However, in practice it lacks compliance and does not fully support the aim to reduce site consumption due to a variety of German specific reasons (e.g. the tax system etc.). However, the main aspects of the law could be used as a starting point for international frameworks.

1.1.6.4 Federal Forest Law (Bundeswaldgesetz – BWaldG), chapter 2

The Federal Forest Law (BWaldG) as a regulatory framework and the forest laws of the Länder, which have priority over the Soil Protection Law according to § 3 No. 6 BBodSchG, regulate the forestry use of soils. In this respect, the idea of sustainability and the principle of correct management are para-

101 Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment.

102 Gesetz zur Stärkung der Innenentwicklung in den Städten und Gemeinden und weiteren Fortentwicklung des Städtebaurechts", June 11, 2013. Bundesgesetzblatt Jahrgang 2013, Teil 1, Nr. 29, ausgegeben zu Juni, http://dipbt.bundestag.de/extrakt/ba/WP17/467/46764.html.

103 Ministerium für Klimaschutz, Umwelt, Landwirtschaft, Natur- und Verbraucherschutz des Landes Nordrhein-Westfalen, http://www.umwelt.nrw.de/.

mount.[104] In § 1 No. 1 BWaldG, the BWaldG makes general reference to the protection of the soils that shall be considered for good professional practice as well as for the designation of protected woodland. While the BWaldG does not contain any regulations for identification of and compliance with environmental risks (and hence also indirect risks for the soil), many forest laws of the "Länder" regulate protection obligations including the obligation to take preventive measures. With regard to planning law, especially the designation of protected woodland plays a role in national forest law.[105] Based on § 12 BWaldG, the instrument of protected woodland designation was integrated in the laws of the Länder; the existence of a particularly protection-worthy territorial situation is a precondition.

The nationwide soil condition survey (BZE) and the European extensive monitoring (BioSoil) provide meaningful basic data for regionalisation e.g. of the C-inventories as two inventory count sessions (15 years: BZE I → BZE II) can be compared to determine the C-inventory changes in German forest soils.[106]

Conceptual approach: The law provides specific solutions to assess and reduce risks to soil in forests.

Suitability: At the international level there seem to be a variety of suitable regulations in place. The conceptual approach of the German Forest Law provides for forests as a special land cover type specific regulations which include a range of interesting instruments for this specific ecosystem. Although Northern forest types are strongly diverging from tropical and other forest types, tools to protect soils underneath can be transferred.

1.1.6.5 Soil protection law of the Länder

After the concluding elaboration of the Soil Protection Law by the national legislators, the soil protection law of the "Länder" only has a gap-filling function, e.g. for the administration of registries of allegedly contaminated sites, execution of soil protection measures in case of extensive harmful soil alterations and for the establishment of separate soil information systems.[107] In the context of the analysis, the Soil Protection Law ("Gesetz zum Schutz des Bodens") of Baden-Wuerttemberg, the Hessian soil protection law as well as the first law for waste management and soil protection of the Free State of Saxony ("Erstes Gesetz zur Abfallwirtschaft und zum Bodenschutz im Freistaat Sachsen"), inter alia, were addressed.

The law of the Länder currently elaborates on the federal law in connection with the creation of soil information systems. Based on the authorisation in § 21 para. 3 BBodSchG, a series of federal states have provided for soil information laws in their Länder laws (see for example § 9 LBodSchG Rheinland-Pfalz, § 6 LBodSchG NRW, § 5 HamBodSchG or § 11 Bay LBodSchAG). According to § 19 para. 2 BBodSchG, the federal government "may" create a multi-state soil information system for federal tasks, making use of the data submitted by the "Länder". No such system has been completed so far. In the context of the soil information systems regulated under "Länder" law, there are several hundreds of permanent observatories that record and assess the short- or long-term alterations of the

104 Möckel, Stefan (2010): Naturnahe Landbewirtschaftung –„Permanent Agriculture" als Chance für die Umsetzung des Naturschutzrechts. Natur und Landschaft (NuL) (4), pp. 149 -153.

106 Wellbrock, Nicole and Erik Grüneberg (2010): Die Bodenzustandserhebung im Wald (BioSoil / BZE) als Grundlage für den Bodenschutz insbesondere der C-Speicherfunktion. In: Tagungsband Bodenschutz in Europa – Ziele und Umsetzung. Marktredwitzer Bodenschutztage Tagungsband 6.

107 Altvater, Susanne (2013): Gutachten „Kosten und Nutzen einer Europäischen Bodenschutzrichtlinie für Deutschland" – FKZ: 3712 14 230 (Study for the Federal Environmental Agency), not published.

soils108. However, the creation of a multi-state soil information system for federal tasks has been launched since 1999 within the framework of UMPLIS projects at the Federal Environmental Agency (the so-called bBIS – bundesweites Bodeninformationssystem (multi-state soil information system)). The project's goal is to detect, display and assess information about the soil functions, soil conditions, and soil contamination and about inputs and outputs of substances. The bBIS shall be understood as an umbrella instrument for relevant soil protection data and is composed of three specialist information systems with professional soil protection topics.109 In connection with this, the national and European digital geo-data infrastructure according to the EU-INSPIRE guideline 2007/2/EG shall also be mentioned.

The sealing regulations shall be outlined as an example. The current regulations (§ 179 BauGB, § 5 BBodSchG) only provide for the possibility for public agencies to take unsealing measures. Regulations under Länder law partially elaborate on this matter.

For example, § 2 LBodSchG Baden-Wuerttemberg requires public agencies to particularly take into account issues of soil protection according to § 1 BBodSchG during planning and implementation of their own construction works and other projects. They shall check in case of intended use of unsealed, not structurally changed or vacant land, inter alia, whether re-use is possible, for example of areas that are already sealed. § 1 LBodSchG NRW also elaborates on the federal law and stipulates: "Land and soil shall be given economic and careful consideration whereby soil sealing shall be limited to what is necessary". However, not all Länder laws on soil protection currently include comparable obligations to take precautionary measures to limit the effects of sealing; for example, there is currently no such obligation explicitly regulated in the state law of Bavaria.

Recently, Hessen has set up standards for soil standards for soil protecting (ecological) construction support. They force relevant stakeholders involved in building processes to evaluate their activities in view of soil conservation.

Conceptual approach: The laws of the federal "Länder" provide for a variety of interesting approaches starting with the obligation for precautionary measures to limit sealing, followed by very detailed soil information systems and standards for soil protecting (ecological) construction support for different stakeholders involved.

Suitability: These approaches therefore seem partly very suitable for adoption under international legal frameworks, although they are not directly transferable due to their regional focus.

1.1.6.6 Soft law zum Flächenverbrauch

Regulatory law either restricting or mandating certain actions is not all-encompassing and could be supplemented by soft law measures, such as economic instruments, to provide flexibility and encourage innovation, cooperation and collaboration in the treatment of land/soil. In addition to assessment of brownfields sites for redevelopment and land recycling, the working group from the Umweltbundesamt (KBU)[110] to reduce consumption of land has issued recommendations which are relevant to land degradation prevention, remediation/offsetting, and planning. Below are some of their recommendations:

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108 Möckel, Stefan (2010): Naturnahe Landbewirtschaftung –„Permanent Agriculture" als Chance für die Umsetzung des Naturschutzrechts. Natur und Landschaft (NuL) (4), pp. 149 -153.

109 1) FIS Bodenkunde der BGR, 2) FIS Altlasten des UBA, and 3) FIS Bodenschutz des UBA, see also: German environmental web platform (Umweltportal Deutschland) at www.portalu.de.

110 Wiggering, H. et al. (2009): Flächenverbrauch einschränken – jetzt handeln. Empfehlungen der Kommission Bodenschutz beim Umweltbundesamt, http://www.umweltbundesamt.de/sites/default/files/medien/479/publikationen/e6e82d01.pdf.

- The land categories could be harmonised throughout Germany. Statistical assessments should be standardised as well using new geo-information systems.
- Section 35 para. 2 of the BauGB should be reformulated so that construction would only be allowed if unsealing and renaturation (creation of a permeable soil layer) occurred elsewhere to the same extent.
- To optimise allocation of newly developed sites (working toward the 30 ha reduction goal), a nationwide trade in land certificates should be introduced. This would optimise development in the locations where it would generate the most economic benefits while preserving other ecologically important areas. Municipalities that do not need their allocations of land could sell them and receive funds to upgrade existing settlement areas.
- Municipalities could be granted a right to adopt bylaws to increase the property tax in certain zones to mobilise sites that are developed but unused and ready to be built upon.
- Stricter enforcement of the law, including regulations of sectoral law to protect the soil and inhibit land consumption as well as limit the municipal competence with regard to land designation and encourage interconnection with a regional land management system.
- Economic instruments could potentially be used, such as a sealing charge for new development and land conversion, land use tax, lower taxation of recycled land, and the introduction of a system of tradable land designation rights (Länder allocation according to clearly defined criteria by the Federal Planning Agency (Bundesraumordnung)).
- Inter-municipal and regional cooperation should be reinforced, e.g. by linking the allocation of grants to the presentation of regionally aligned development concepts.

Conceptual approach: The soft law measures presented above to encourage prevention, remediation/offsetting and planning against land degradation include land recycling, land category standardization, offsetting with specific regeneration standards (e.g., unsealing, permeability), land certificate trading scheme, property tax incentives or disincentives, charges (sealing or conversion), coordinated landscape or regional land management planning, etc.

Suitability: Some of the elements outlined above could be used within the international regime and provide flexible options for systems in which strict land regulation or legal enforcement is not as effective as i.a. economic instruments in influencing behaviour.

1.2 United States

1.2.1 Introduction

Land degradation within the United States involves a variety of threats that occur at various scales and intensities throughout the country, which spans about over 800 billion hectares in total. Aside from rural Federal lands (21%), there are three major land uses within the United States, each of which comprise similar amounts of surface area: rangeland (21 %), forest land (21 %), and cropland (19 %).[111] Developed land only makes up 6 % of the total surface land cover.[112] Thus, the country is predominantly rural and has a significant amount of natural resources primarily controlled by private actors or state and local governments.

Soil erosion is a serious concern that continues to affect land in the US despite many years of targeted government programs and policies. According to the 2010 National Resources Inventory conducted by the Natural Resources Conservation Service (NRCS) of the United States Department of Agriculture (USDA), both water and wind soil erosion from cropland has decreased by approximately 40% since 1982.[113] However, approximately 1.7 billion tons of soil are still lost from cropland every year, which is attributed to management practices as well as natural conditions.[114] Soil erosion depletes soil quality through loss of organic matter and may lead to reductions in soil productivity.[115] An extreme example of soil loss through wind erosion was the Dust Bowl in the 1930s, which involved a decade-long drought that caused the semi-arid and dry sub-humid perennial grassland soils of the Great Plains to be blown away as they had been cultivated to produce wheat crops.[116] This environmental disaster spurred the federal farm legislation, still existing today in a heavily amended form, which attempted to move production away from soil-depleting crops to soil-conserving crops.[117]

Large quantities of US land are also developed for a number of different uses, e.g., residential, commercial, industrial. Forty-three million acres were converted from another use for development during the period 1982 to 2010, including even "prime farmland".[118] Thus, soil sealing is a concern since covering soils with buildings, parking lots, or roads, for instance, destroys the ecological functions of the soil.[119] Lands most at risk of being converted for development are the areas surrounding urban settlements due to urban sprawl, or expansion of the city.

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111 U.S. Department of Agriculture (2013). Summary Report: 2010 National Resources Inventory, Natural Resources Conservation Service, Washington, DC, and Center for Survey Statistics and Methodology, Iowa State University, Ames, Iowa. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1167354.pdf.

112 Ibid.

113 Ibid.

114 Ibid. Soil erosion levels steadily declined since 1982, but starting in 2007, loss rates plateaued to approximately the same amount every year.

115 Eswaran, H., Lal, R., Reich, P.F. (2001) Land Degradation: An overview. In: Bridges, E.M., I.D. Hannam, L.R. Oldeman, F.W.T. Pening de Vries, S.J. Scherr, and S. Sompatpanit (eds.). Responses to Land Degradation. Proc. 2nd. International Conference on Land Degradation and Desertification, Khon Kaen, Thailand. Oxford Press, New Delhi, India.

116 Worster, D., Dust Bowl: The Southern Plains in the 1930s (Oxford U. Press, 1982).

117 For a historical look at the development of the Farm Bill, see McGranahan, D.A. et al., A historical primer on the US farm bill: Supply management and conservation policy, 68(3) J. of Soil and Water Conservation, May/June 2013.

118 Ibid. See also International Union for Conservation of Nature and Natural Resources, World Conservation Strategy, Chapter 5: Priority requirements: ecological process and life-support systems. Available at https://portals.iucn.org/library/efiles/html/WCS-004/section11.html.

119 Prokop, G., Jobstmann, H., Schönbauer, H. (2011) Overview of best practices for limiting soil sealing or mitigating its effects in EU-27, Final Report by the Environment Agency Austria to the European Commission, DG Environment.

Due to industrialisation and the use of chemicals in manufacturing processes, toxic waste is generated which must be disposed of. Land contamination has occurred at numerous sites around the country from improper disposal or leakages which have occurred during manufacture, for example, which pose significant human and environmental health hazards.[120] Costs for remediation of such sites are extremely high; thus, the federal government created the Superfund program (see below Section 3) to provide funds to respond quickly to these problems and to impose liability for remediation on those responsible.[121]

Wetlands are also threatened with conversion and degradation of their rich organic soils, ecosystem service functions, and biodiversity.[122]

1.2.2 United States' legal system

The United States is a federal system established by the Constitution, which is the supreme law of the land.[123] It enumerates certain powers granted to a central federal government, and the remaining powers are reserved to the jurisdiction of the fifty states.[124] The Constitution establishes and grants specific power to three branches of the federal government: executive, legislative, and judicial.[125] The legislature makes the laws, the executive implements and enforces the laws, and the judiciary interprets the laws within a common law system which operates on precedent under the doctrine of *stare decisis*.[126] This principle of "separation of powers" allows each branch to act as a check and balance on the constitutionality of the other branches' actions.[127] Additionally, administrative agencies play a significant role in implementing the laws. Congress typically delegates authority to an agency to issue detailed regulations through the "notice and comment" process, to enforce the regulations (e.g., compliance orders), and to adjudicate regulatory violations.[128]

As stated above, the states have the power to enact their own constitutions and laws, but pursuant to the Supremacy Clause, those enactments must not exceed or conflict with the federal Constitution and federal statutes.[129] Each state has its own legislature, a governor which is head of the state exec-

120 Environmental Protection Agency, Superfund, http://www.epa.gov/superfund/sites/.

121 E.g., $500 million for the Gowanus Canal in New York. The New York Times, Superfund: Chronology of Coverage, http://topics.nytimes.com/top/reference/timestopics/subjects/s/superfund/index.html. As described below in Section 3, under the statute the government can then sue the party responsible for the toxic waste contamination to recover the cleanup costs. However, in some cases the party may not be identified or the responsible party might move too slowly in response to the toxic waste problem, so rather than waiting, the Superfund program allows the government to move forward immediately.

122 Sucik, M.T., Marks, E., The Status and Recent Trends of Wetlands in the United States. Natural Resources Conservation Service, http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1262239.pdf.

123 U.S. Constitution, Article VI.

124 Calabresi, S.G. (1995): "A Government of Limited and Enumerated Powers": In Defense of United States v. Lopez, Michigan Law Review 94(3):752; Pryor Jr., W.H. (2001) Madison's Double Security: In Defense of Federalism, the Separation of Powers, and the Rehnquist Court, Alabama Law Review 53(4):1167.

125 U.S. Constitution, Articles I-III.

126 Rehnquist, J.C. (1986): The Power that Shall be Vested in a Precedent: Stare Decisis, the Constitution and the Supreme Court, Boston University Law Review 66:345.

127 Levi, E.H. (1976): Some Aspects of Separation of Powers, Columbia Law Review 76(3):371; Pryor, see note 2 (quoting The Federalist No. 51, at 67 (James Madison) (Lester DeKoster ed., 1976).

128 Rosenbloom, D.H. (1983): Public Administrative Theory and the Separation of Powers, Public Administrative Review 43(3):219 (discussing the multi-faceted role of administrative agencies in terms of "managerial", "legal", and "political" functions following the separation of powers divide).

129 U.S. Constitution, Article VI.

utive, and a supreme court that issues rulings on matters of state law.[130] States are then further subdivided into counties (or parishes in Louisiana and boroughs in Alaska), which might then be subdivided into townships and municipalities of various titles depending on the state (e.g., city, town, village, borough). Typically local governments function as councils, boards, a local mayor (the representative of the city/town), etc., which make decisions on local issues that are in accordance with the state and federal constitutions. States may also delegate responsibilities to the local level, which would include issuing local ordinances such as for land use planning and zoning.

Table 5: Overview of the United States legislative system

Federal level	Congress of the United States (divided into the Senate and the House of Representatives) Multiple administrative agencies with delegated rulemaking authority (e.g., Environmental Protection Agency)
State level	State legislatures
Local level	County council, city council, mayor, planning and zoning commission, etc.

International treaties are within the President's power to negotiate and agree to, but they must be ratified by the Senate by a two-thirds majority.[131]

As mentioned above, administrative agencies may be delegated the power to conduct a notice and comment rulemaking, which involves publishing a proposed version of a regulation in the Federal Register and opening it up to comments by any person or institution for a certain period of time.[132] The agency must keep a record of the rulemaking process and address all comments which are submitted, which for highly contested regulations (e.g., the current proposed "Waters of the US" regulation by the EPA) may involve hundreds of thousands.[133]

1.2.3 Important laws

Below is Table 6 indicating the land degradation categories to which each relevant law identified in the EU/Germany case study applies.

130 Federal Judicial Center, The U.S. Legal System: A Short Description, http://www.fjc.gov/public/pdf.nsf/lookup/U.S._Legal_System_English07.pdf/$file/U.S._Legal_System_English07.pdf.

131 U.S. Constitution, Article II, Section 1.

132 Administrative Procedure Act, 5 U.S.C. § 553.

133 Ibid. § 552. See, e.g., Fatka, J., House sends strong message against EPA's water rule, Feedstuffs, September 9, 2014, http://feedstuffs.com/story-house-sends-strong-message-against-epas-water-rule-45-117479 (discussing the legislative act proposed in the House of Representatives aimed at blocking the EPA from adopting the Waters of the US rule); The Hagstrom Report, EPA responds to SBA Advocacy office on WOTUS, October 2, 2014, http://www.hagstromreport.com/2014news_files/2014_1002_epa-responds-sba-advocacy-office-wotus.html; Traxler, M., Proposed EPA water rules worry farmers, Prairie Business, October 10, 2014, http://www.prairiebizmag.com/event/article/id/21216/.

Table 6: Matrix of United States laws by category and soil threat

Laws	Prevention	Remediation/ Offsetting	Planning	Threats
Resource Conservation and Recovery Act	X	X	X	Contamination
Clean Water Act	X	X		Erosion, contamination
Agricultural Act of 2014	X	X	X	Erosion, sealing, salinisation
National Environmental Policy Act	X		X	Sealing, contamination, erosion
Conservation Title 16	X	X	X	Erosion, sealing
Comprehensive Environmental Response, Compensation , and Liability Act		X		Contamination
National Urban Policy and New Community Development Act			X	Sealing, contamination

1.2.3.1 Resource Conservation and Recovery Act of 1976

The Resource Conservation and Recovery Act of 1976 (RCRA) helps to prevent and remediate soil contamination by regulating the land-based disposal of solid waste and hazardous waste management.[134] The law is primarily aimed at preventing contamination of the environment, but it also provides for planning in terms of waste disposal sites and corrective actions (remediation) following leaks from hazardous waste disposal sites and underground storage tanks. Thus, the process of designating sites for disposal activities may help avoid sensitive soil areas as well.

Federal technical and financial assistance is mandated to assist States and regional authorities in developing comprehensive planning for solid waste disposal which is environmentally sound, recovers materials from solid waste, and encourages resource conservation.[135] Under these plans, solid waste must be disposed of in a sanitary landfill or in an otherwise environmentally sound manner – "open dumps" of solid waste outside of a sanitary landfill are prohibited under section 4005 of RCRA.[136]

The Environmental Protection Agency (EPA) was required to develop solid waste management guidelines with criteria for solid waste disposal facilities and practices, i.e., sanitary landfills.[137] If those criteria are violated, the solid waste disposal facilities and practices are considered to pose a "reasonable probability of adverse effects on health or the environment" and are thereby classified as an "open dump".[138] For example, regulations aim to prevent facilities or practices on floodplains that

134 42 USC § 6902.
135 42 USC § 6941.
136 42 USC § 6945 (Pub. L. 89-272, title II, § 4005, as amended).
137 42 USC § 6907.
138 40 CFR pt. 257.1-257.3.

could affect the quality of the floodplain as well as "pose a hazard to human life, wildlife, or land and water resources" through a washout of solid waste.[139] Contamination of surface water and groundwater from non-hazardous solid waste disposal is also targeted, as is "land used for the production of food-chain crops" by restricting types of solid waste to application levels corresponding with the soil pH.[140]

RCRA also outlines detailed standards owners and operators of treatment, storage and disposal facilities for hazardous wastes listed by the EPA (as well as for generators and transporters) have to follow.[141] If the waste meets the criteria and thresholds for toxicity, ignitability, corrosivity, and / or reactivity, it will be listed as a hazardous waste.[142] The system is intended to prevent contamination by controlling the wastes "cradle to grave", or from the time they are created until they are disposed of, and preventing migration from the specifically designated disposal sites using materials such as double-impervious liners. Requirements include recordkeeping of the hazardous material and the method with which it was treated, stored, and disposed of, which must be pursuant to the regulations created by the EPA.[143] In addition, the location, design and construction of the treatment, storage and disposal facilities is regulated, permits are required, and contingency plans must be in place to effectively minimize unanticipated damage from such treatment, storage and disposal of the hazardous waste.[144] Some hazardous wastes are also prohibited from land disposal due to the potential for contamination of the environment and risk of adverse human health impacts.[145]

Provisions pertaining to underground storage tanks are also included under the statute, which are intended to prevent harm to human health and the environment by detecting, preventing, and correcting releases from the tanks. A leak detection system as well as records must be maintained, releases must be reported, and corrective action must be taken to respond to releases.[146] Corrective actions are taken using a risk-based approach, so the degree of cleanup would depend on the potential for exposure and amount of risk to human health and the environment.[147] Due to the high potential for damage to the environment if the tanks leak and the need for quick responses, the statute includes a useful mechanism for remediation. Each tank owner and operator must provide financial evidence of being capable to respond to leaks, but if the State must address the leak instead of the owner or operator, the EPA can recover the costs.[148] In addition, the liable person may not be indemnified, held harmless, or have the liability transferred through an agreement or conveyance to another person, though insurance agreements are allowed, and there is no statute of limitations to bringing a cause of action against the liable person.[149] These provisions collectively aim to ensure the liable owners and operators take necessary precautions to prevent leakage, both in the short and long term.

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139 40 CFR pt. 257.3-1.

140 40 CFR pt. 257.3-257.5.

141 40 CFR pt. 261.

142 40 CFR pt. 261.20.

143 42 USC § 6924.

144 42 USC §§ 6924-6925 (including the Land Disposal Restrictions program under the EPA regulations 40 CFR pt 268).

145 42 USC § 6924(d). Land disposal is defined as "any placement of such hazardous waste in a landfill, surface impoundment, waste pile, injection well, land treatment facility, salt dome formation, salt bed formation, or underground mine or cave". 42 USC § 6924(k).

146 42 USC § 6991b.

147 42 USC § 6991b(h)(5).

148 42 USC § 6991b(h)(6).

149 42 USC § 6991b(h)(6)(C).

Conceptual approach: The RCRA employs different types of legal approaches to avoiding land contamination from waste disposal and storage activities.

- A scheme of oversight and support (e.g., guidance and financial and technical assistance) for the state actors who implement federal standards, in this case designating and managing locations for non-hazardous solid waste disposal.
- A permit scheme for private actors who conduct these potentially extremely dangerous and harmful activities (e.g., generating, storing, transporting and disposing hazardous waste.
- A tracking system with information reported by each actor along the chain (e.g., tracking hazardous waste movement from "cradle-to-grave").
- Financial evidence required of the private actors' ability to respond to environmental contamination resulting from their activities, e.g., including transport, storage and disposal of hazardous waste and installing/using underground storage tanks.
- A cost-recovery mechanism in case the government has to pay for response and clean-up actions and then recover the costs from the responsible actor.
- No ability to transfer liability or be indemnified or held harmless by another actor (polluter-pays principle).
- No statute of limitations to bring a cause of action against the responsible actor.

Suitability: The RCRA statute is not suitable for verbatim adoption at the international level in order to prevent, remediate, or plan against land degradation. It is tailored to the US system whereby power is delegated to decentralised governmental actors (i.e., state agencies) to carry out the mandates and is centred around the assumption that some, if not all of the operators who would be regulated and permitted are private actors, which may not always be the case in other countries. However, the tracking mechanism within RCRA as well as the permitting scheme for actors generating, handling, and disposing of potentially dangerous and environmentally harmful materials could be a useful example of preventative mechanisms to upscale to the international level in order to avoid contamination and land degradation. Additionally, the cost-recovery mechanism from responsible actors after government response and clean-up of contamination is a useful tool for remediation of land degradation, and it could prevent even larger or more detrimental pollution from slow responses by the responsible actors. The unlimited statute of limitations for bringing a tort-style cause of action (e.g., injured person suing for damages due to negligence or strict liability on the part of the responsible actor) could be useful to upscale in order to prevent land degradation. A suit would be brought after the damage has occurred, but such threat of financial liability would disincentivise actions through the potential threat of liability after harm has been done.

1.2.3.2 Clean Water Act

The Clean Water Act (CWA) is the comprehensive federal legislation dealing mainly with water pollution, but some of its provisions such as wetlands protection contribute to prevention of soil degradation. To protect water quality, the CWA establishes a framework of standards and limitations for the direct discharge of effluent by point sources into water bodies within the US. The CWA provides for effluent limitations on point sources based on the best technology available, taking cost into account. In addition, the Act requires states to set water quality standards for particular bodies of water which would "assure protection of public health, public water supplies, agricultural and industrial uses, and the protection and propagation of a balanced population of shellfish, fish and wildlife, and allow recreational activities in and on the water".[150] For those water bodies exceeding the established standards for a particular pollutant, the state must calculate a total maximum daily load of pollution

150 33 USC § 1312-1313.

allowable and then ensure that the sources of the pollution meet that limit. Additionally, it provides for remediation by the EPA of contamination from oil spills and other releases of hazardous substances into water or on land which threatens water bodies.[151] However, these provisions primarily target pollution sources which directly impact water bodies rather than land uses which indirectly influence water quality.

Nonetheless, the CWA also encourages States to implement non-point source pollution programs, which more directly impact soil protection.[152] These programs are based on the assessment that certain water bodies cannot be reasonably expected to attain water quality standards without addressing non-point sources of pollution, such as dense livestock production near waterways or soil erosion carrying nutrient loads into the water.[153] Best management practices and measures should be identified which can help to reduce the pollution levels.[154] These non-point source pollution programmes can have a preventative effect on land degradation, e.g., reducing the amount of nutrients applied to land for crop production which exceed plant uptake and can cause either leaching or run-off into water bodies as well as installing buffer strips or grassed waterways along water bodies.[155] Although nonpoint source controls are not mandated by the federal act, EPA ties some grant funding to state implementation of these programs.

Additionally, helps control wetland destruction by requiring a permit for dredging and filling any water of the United States, which includes some wetlands.[156] It is notable that the dredge and fill permitting scheme, administered by the Army Corps of Engineers, specifically exempts from coverage normal farming activities, “such as plowing, seeding, cultivating, minor drainage, harvesting for the production of food, fiber, and forest products, or upland soil and water conservation practices”.[157] Permits for filling wetlands may be granted if the Corps is convinced that the action will not have an unacceptable adverse effect on the environment.

Impacts under the scheme must be avoided and minimized, but for unavoidable impacts, the Corps (or a designated state authority) determines the appropriate amount and form of compensatory mitigation to be stipulated in the permit. Wetland mitigation banking is one possible method, which involves offsetting wetland destruction in one location with creation or enhancement of a wetland in another location subject to official rules issued by the EPA). However, it should be noted that the dredge and fill permitting scheme does not necessarily prevent wetland destruction, and mitigation banking of wetlands does not actually remediate the land degradation on the land which has necessitated the dredge and fill permit. Instead, it is aimed at offsetting the degradation with potential remediation of land degradation on another parcel of land.

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151 33 USC § 1321.

152 Non-point sources can be defined as sources of pollution that are not point sources under 33 USC § 1362(14) (“The term "point source" means any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural stormwater discharges and return flows from irrigated agriculture.”).

153 33 USC § 1329(a).

154 33 USC § 1329(b).

155 Iowa Department of Natural Resources, Watershed Improvement Section, Total Maximum Daily Load for Nitrate: Cedar River, Linn County, Iowa, at 37-43 (2006), http://www.epa.gov/region07/water/pdf/ia-tmdl/cedar_river_final_tmdl100206.pdf; Environmental Protection Agency, Neosho Basin Total Maximum Daily Load, at 19, http://www.epa.gov/region07/water/pdf/ks-tmdl/eaglecreek_copper_final022505.pdf.

156 33 USC § 1344.

157 Ibid. §1344(f).

The impact of these requirements has been limited somewhat because the Act reaches only wetlands defined as "navigable waters." The term "navigable waters" has been the subject of several U.S. Supreme Court decisions and yet uncertainty remains (e.g., whether intermittent streams which only have flowing water after heavy rainfall are included).[158] In general, the term "navigable waters" is understood to encompass "interstate waters, plus waters that are navigable, wetlands adjacent to navigable waters and other waters with a *substantial connection* to navigable waters."[159] The EPA has currently proposed the "Waters of the US" rule to clarify which waters are covered and need dredge and fill permits based on a recent hydrology connectivity study.[160] The proposed rule is intended to avoid regulatory uncertainty[161]; however, farmers and farming organizations are generally resistant to the rule since they fear it will lead to expanded regulatory control over small streams or wetlands on their farms which do not demonstrate an obvious connection to navigable waters.[162] For those wetlands not covered by the federal provision, individual states may have legal restrictions which apply.

Conceptual approach: The CWA includes the following legal concepts to address land degradation actions which have an impact on water quality.

- Water quality standards based on the existing or potential uses for different water bodies, e.g., drinking, recreation, protection of aquatic life.
- Programmes designed to identify contributors to pollution levels and reduce their individual contributions according to the percentage by which overall pollution levels need to decrease in order to meet the water quality standard.
- Different treatment of pollution sources – direct (point) and indirect/diffuse (non-point).
- Permitting scheme for direct discharge of pollution into water.
- Permitting scheme for dredging and filling wetlands, including an offsetting requirement.

Suitability: The CWA is not suitable for adoption as a comprehensive example of national legislation aimed at land degradation neutrality which could implement the LDNW target on the international scale. It is limited to prevention of negative impacts on water quality from land-based activities and remediation of land degradation with regard to a specific land type – wetlands. However, the particular instruments employed under the statute to prevent and remediate land degradation provide useful examples which could be tailored to the international context and upscaled. For example, setting water quality standards which may not be exceeded means that even contributing non-point sources of pollution must modify their actions to meet those finite targets. Additionally, a permitting scheme

158 Most recently, two cases were decided which caused ambiguity in terms of whether the Army Corps of Engineers' jurisdiction would extend to certain water bodies. Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers, 531 U.S. 159 (2001) (isolated wetland without a substantial nexus to a navigable water and neither bird migration nor bird-watching tourism had a substantial impact on interstate commerce to justify federal regulation); Rapanos v. United States, 126 S. Ct. 2208 (2006) (split opinion with tests for determining whether the wetland is covered – Scalia insisted on a continuous hydrological connection to water traditionally navigable, e.g., not ephemeral or temporary, and Kennedy stated there must be a significant nexus to a navigable water).

159 Gruenhagen, C. (2014): Environmental Law Conference Regulatory Update, Iowa State Bar Association, pp.14-15 (on-file with author) (emphasis added). The "substantial connection" requirement is derived from the US v. Lopez case which limited the federal government's ability to justify regulation of isolated wetlands with the Commerce Clause, instead requiring a substantial connection or nexus between a wetland and navigable waters. United States v. Lopez, 514 U.S. 549 (1995).

160 Ibid.

161 EPA, Waters of the US, http://www2.epa.gov/uswaters.

162 Traxler, M., Proposed EPA water rules worry farmers, Prairie Business, October 10, 2014, http://www.prairiebizmag.com/event/article/id/21216/.

for sensitive lands (e.g., wetlands) would help prevent uncontrolled degradation, and the remediation requirement (e.g., offsetting) would help to achieve a balance of net land degradation neutrality.

1.2.3.3 Agricultural Act of 2014

The Farm Bill is a comprehensive piece of legislation passed every five to seven years and has included various forms of agricultural support over the years (e.g., price support, direct payments, crop insurance) as well as conservation and food assistance programs.[163] Similar to the EU Common Agricultural Policy, the Farm Bill greatly influences land use within the United States from an agricultural perspective, in relation to commodities planted, production practices used (conservation programs), forestry provisions, livestock management, and other land-related topics.

The Agricultural Act of 2014 is the most recent Farm Bill passed by Congress, which continued the mandatory restrictions for production on certain types of land. Sodbuster and Swampbuster are conservation compliance measures originally adopted in the 1985 Farm Bill which require landowners who have highly-erodable land (HEL) and/or wetlands to create and abide by a conservation management plan developed with the NRCS and to not convert wetlands.[164] Similar to the mitigation banking requirement under the Clean Water Act, non-compliance under the Swampbuster programme requires some form of mitigation, including restoring a converted wetland, enhancing an existing wetland, or creating a new wetland.[165] Compliance is now tied to crop insurance since direct payments were eliminated by the 2014 Farm Bill, so farmers who do not come into compliance lose *inter alia* their eligibility for federally subsidized crop insurance premiums.[166] These measures aim to prevent land degradation on special types of land which are prone to erosion and fulfil many different necessary ecosystem services.[167] As discussed in Section 1.3.3.8 below, land use is often under the jurisdiction of the state and local governments, but the federal government has prioritised these land types as important to preserve. Thus, they have conditioned the purveyance of federal funding to local private actors with those types of land upon certain sustainable land management requirements.

Additionally, voluntary incentive programmes were continued and consolidated from past Farm Bills.[168] Below in Table 7 is a brief description of the most relevant programmes which contribute to land degradation prevention and remediation.

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163 Agricultural Act of 2014, H.R. 2642, Pub. L. 113-79; see Dimitri, C. et al., The 20th Century Transformation of U.S. Agriculture and Farm Policy, Economic Research Service, United States Department of Agriculture, Economic Information Bulletin No. 3, June 2005, available at file:///C:/Users/owner/Downloads/00b7d51e844f9326d0000000%20(1).pdf.

164 Food Security Act of 1985, Public Law No. 99-198, 99 Stat. 1354; Hamilton, N.D. (1989) Legal Issues in Enforcing Federal Soil Conservation Programs: An Introduction and Preliminary Review, U.C. Davis Law Review 23:637; Malone, L.A. (1988) Swampbuster, Sodbuster, and Conservation Compliance Programs, Popular Media, Agricultural Law Update, Paper 103, http://scholarship.law.wm.edu/cgi/viewcontent.cgi?article=1105&context=popular_media.

165 Agricultural Act of 2014, H.R. 2642, Pub. L. 113-79, § 2609.

166 Agricultural Act of 2014, H.R. 2642, Pub. L. 113-79, § 1118. See generally Stubbs, M. (2014) Conservation Provisions in the 2014 Farm Bill (P.L. 113-79). Congressional Research Service report, available at http://nationalaglawcenter.org/wp-content/uploads//assets/crs/R43504.pdf.

167 Ramsar Convention, The Importance of Wetlands, http://www.ramsar.org/about/the-importance-of-wetlands.

168 Stubbs, note 94, provides an excellent overview of the Farm Bill conservation programmes which were adopted under the Agricultural Act of 2014 as well as non-Farm Bill conservation programmes.

Table 7: 2014 Farm Bill conservation programmes contributing to LDNW

Programmes in the 2014 Farm Bill	Description
Conservation Reserve Program (CRP)	The landowner contracts with the Farm Service Agency (FSA) to take HEL or environmentally sensitive land out of production and convert it to vegetative cover for between 15-20 years.[169] A conservation plan must be adopted (NRCS provides technical assistance), and payments are issued to the farmer in the form of annual rental payments and cost-sharing to establish the vegetation.[170]
Conservation Stewardship Program (CSP)	This is a working land conservation programme under which the landowner takes on specific, appropriate conservation measures to address at least two priority resource concerns on his or her land under a five-year contract with the Natural Resources Conservation Service (NRCS).[171] The payments are now assessed according to the extent to which the conservation measures address the identified problem, the level of stewardship over time, and the integration of the activities throughout the operation.[172]
Environmental Quality Incentives Program (EQIP)	A working land conservation programme under which the landowner must demonstrate implementation of conservation practices and activities from an EQIP plan of operations designed to address natural resource concerns on his or her land.[173] Payments are issued through the NRCS for these activities for income foregone, as well as cost-sharing and advance payments in certain circumstances, under a contract that may last up to ten years.[174]
Agricultural Conservation Easement Program (ACEP)	This programme adopted under the Agricultural Act of 2014 is a combination of former easement programmes: Wetlands Reserve Program, Grassland Reserve Program, and Farmland Protection Program.[175] Financial assistance up to 50% of the market value of the agricultural land may be contributed to help protect productive farmland from conversion to other uses.[176]

169 Agricultural Act of 2014, H.R. 2642, Pub. L. 113-79, §§ 2001-2008.

170 USDA-NRCS, Conservation Reserve Program, http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/?cid=stelprdb1041269.

171 Agricultural Act of 2014, H.R. 2642, Pub. L. 113-79, § 2101. The NRCS is an agency under the United States Department of Agriculture (USDA), which works with other agencies, local and state governments, as well as farmers and ranchers to help conserve the nation's soil and water resources. USDA-NRCS, History of NRCS, http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/about/history/.

172 Stubbs, note 94.

173 Agricultural Act of 2014, H.R. 2642, Pub. L. 113-79, §§ 2201-2208; USDA-NRCS, 2014 Farm Bill: Environmental Quality Incentives Program, http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/about/?cid=stelprdb1242633.

174 Stubbs, note 94.

175 Stubbs, note 94. Easements are a voluntarily adopted permanent or long-term land-use restriction, for which the government makes payments under this programme but easements may also be granted to private individuals.

176 Agricultural Act of 2014, H.R. 2642, Pub. L. 113-79, §§ 2001-2508.

A new programme adopted under the Agricultural Act of 2014 was the Regional Conservation Partnership Program (RCPP).[177] This programme integrates elements of four former programmes: the Agricultural Water Enhancement Program, the Chesapeake Bay Watershed program, the Cooperative Conservation Partnership Initiative, and the Great Lakes basin program for soil erosion and sediment control.[178] It involves partners (which may include private farmer organisations, state and local governments, water districts or treatment facilities, etc.) establishing conservation projects with producers in limited geographic areas and entering into a contract with USDA of up to five years wherein the federal government leverages the private financing of these projects.[179]

The voluntary incentive programmes are mainly focused on prevention of land degradation through conservation measures and contracts with private landowners to sustainably manage the land in exchange for payments by the federal government. The restoration element of note is the CRP, which aims to improve the condition of highly-erodable and sensitive lands by specifically increasing vegetation as well as preventing them from potentially further degradation. Planning is carried out with the NRCS to implement the long-term contracts for conservation actions (whether to take land out of production or use conservation practices on working lands). These measures target not only the soil threats of erosion and wetland destruction, but also sealing through the easement against land use conversion and potentially salinisation and contamination from excessive fertiliser or pesticides if those are identified issues for the particular area of land under agreement with the NRCS.

Conceptual approach: The Farm Bill incorporates both mandatory and voluntary legal concepts to prevent, remediate, and plan against land degradation resulting from agricultural activities.

- Mandatory compliance measures on high-risk land to prevent degradation.
- Remediation measures for non-compliance with restriction on wetland conversion.
- Governmental subsidies conditioned on compliance with the mandatory measures.
- Funds available for voluntary actions in the public interest, e.g., set-asides, sustainable agricultural practices, legal protection against conversion of land.
- Government funding to incentivise collective action or public-private partnerships.

Suitability: The Farm Bill is highly specific to the US agricultural context whereby producers are subsidised for agricultural crop insurance premiums and incentivised to provide environmental services beyond the baseline of good management practices. It does not provide a mechanism to implement the LDNW target on the international scale. There are elements of the law which could be useful for inclusion in an international approach to land degradation neutrality. The conservation compliance measure which conditions any governmental funding on the producer abiding by restrictions on high-risk lands, as well as the offsetting mechanism for non-compliance with the restriction on wetland conversion are two mechanisms for prevention and remediation that could contribute to achieving zero net land degradation. They are only applicable to a limited amount of sensitive lands though, so it would not cover all land degradation. The funds provided for voluntary action to avoid land degrading activities are useful, in particular the set-aside of sensitive lands, the easement mechanism to maintain the land under a certain use, and the governmental funds to leverage public-private partnerships.

177 Agricultural Act of 2014, H.R. 2642, Pub. L. 113-79, § 2401.

178 Stubbs, note 94.

179 Agricultural Act of 2014, H.R. 2642, Pub. L. 113-79, § 2401.

1.2.3.4 National Environmental Policy Act of 1969

The National Environmental Policy Act (NEPA) is the environmental statute that applies to federal agencies' proposed actions on Federal lands which may have a significant impact on the environment and requires integration of this consideration into the government agency's planning and decision-making process.[180] In order to ensure that environmental impacts were taken into account, NEPA requires that a baseline environmental assessment be conducted to determine whether there could be significant environmental impacts resulting from the proposed action if the significance of the impacts is uncertain. If there is a finding that significant impacts may result, an environmental impact statement (EIS) must be prepared, outlining unavoidable impacts which will result if the project is implemented and reasonable alternatives which exist to the proposed actions, including methods to mitigate the impacts. The federal actions triggering NEPA consideration include not only federal projects, but also state or private projects that require federal permits or funding. The Council on Environmental Quality (CEQ) approves the EIS; however, the entity proposing the federal action is subsequently not required to choose an alternative with less significant environmental impacts. CEQ regulations require a public record of decision following approval of the EIS and the final decision of action to be taken, the reasonable alternatives considered, whether all reasonable measures for avoiding impacts have been taken, and if they have not, why not.[181]

This statute is a mixture of prevention and planning in terms of proposed federal actions. This type of procedure can structure the process so that environmental impacts are taken into account and the agency chooses to carry out the action differently. However, there is no requirement that the alternative with the least significant impacts must be chosen, so as long as the actor can illustrate that the impacts have been adequately considered. The procedural requirements within this statute may help avoid or reduce sealing, contamination, erosion, or wetland destruction which may result from the agencies' proposed projects, decisions, funding allocations, and/or actions on Federal lands.

An important US mechanism to ensure that an agency's decision-making process adequately considered environmental impacts is the possibility for citizens to bring suit under the Administrative Procedure Act.[182] Standing is necessary, or the right of the plaintiff (challenger) to bring suit against the defendant (agency), which generally requires a showing of "(1) injury in fact; (2) the injury is fairly traceable to the challenged action of the defendants; and (3) it is likely that the injury will be redressed by a favorable decision".[183] *City of Los Angeles v. National Highway Traffic Safety Administration* is an example of a case wherein citizens challenged an agency decision not to conduct an environmental impact statement regarding its proposal to lower fuel economy standards.[184]

Conceptual approach: NEPA applies the conceptual approach of a procedural check on agency decision making and action so that environmental impacts are considered. If significant impacts are shown to result, alternative actions must be proposed but need not be adopted instead. Public recordkeeping and transparency is required in the agency's consideration of the various options as well as consideration of the unavoidable impacts from the final action it decides to pursue. Suit may be brought under the APA by any citizen adversely affected by action to ensure compliance.

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180 42 U.S.C. §§ 4331-4347.

181 Luther, L. (2005) The National Environmental Policy Act: Background and Implementation. Congressional Research Service Report for Congress.

182 5 U.S.C. § 500-596.

183 O'Brien, C. (2009) I Wish They All Could Be California Environmental Quality Acts: Rethinking NEPA in Light of Climate Change. Boston College Environmental Affairs Law Review 36:239.

184 912 F.2d 478 (D.C. Cir. 1990).

Suitability: NEPA is not a sufficient piece of legislation to implement the LDNW target at international level. Aside from the fact that many international agreements require the inclusion of environmental impact assessments as a national measure to implement their objectives and obligations, the environmental impact statement codified in this statute does not contain sufficiently stringent requirements to prevent land degradation. It simply requires the potential for degradation to be considered before action is taken. In the end, however, even if a suit is brought to require an agency to complete an environmental impact statement and a full analysis is completed with a report on the unavoidable impacts and alternate action, the original proposed action may still be taken and land may be degraded. In addition, only those actions with some federal involvement (e.g., a permit or funding) are covered, which would leave many private actions involving degradation unaddressed.

1.2.3.5 Conservation Title 16 provisions in the US Code

The laws included under Title 16 of the US Code include different types of prevention, remediation, and planning provisions. They vary in scope as to the specific land type, public or private land, as well as to which target actor they apply. The various laws will be briefly presented and then collectively analysed for the conceptual approaches used as well as their suitability for use at the international level in implementing the LDNW target.

1.2.3.5.1. Soil Conservation and Domestic Allotment Act

The Soil Conservation and Domestic Allotment Act is a US law directly targeting the threat of soil erosion. It authorizes the Secretary of Agriculture to conduct surveys and research into soil erosion and preventative measures that could help combat it, enter into cooperative agreements with persons or agencies, acquire rights to or an interest in land, and "carry out preventative measures, including, but not limited to, engineering operations, methods of cultivation, the growing of vegetation, and changes in use of land".[185] The scope of the law applies to government-owned or -controlled lands and other non-governmental land for which consent and/or the necessary rights and interests have been obtained.[186]

Additionally, under the law specific lands are recognized as highly prone to soil and water erosion, e.g., Great Plains, and in need of sustainable management by owners and operators by conversion to soil conserving rather than soil depleting uses.[187] The government may enter into two-year contracts with producers to:

- plant cover crops and legumes in particular
- stop producing certain types of soil depleting crops according to the Secretary of Agriculture
- refrain from "harvest[ing] any crop from or graz[ing] the designated acreage during the agreement period, unless the Secretary determines that it is necessary to permit grazing or harvesting in order to alleviate damage, hardship, or suffering caused by severe drought, flood, or other natural disaster, and consents to such grazing or harvesting subject to an appropriate reduction in the rate of payment".[188]

185 16 U.S.C. § 590a.
186 16 U.S.C. § 590b.
187 16 U.S.C. § 590q-3.
188 Ibid.

1.2.3.5.2. Soil and Water Resources Conservation

This law authorizes and directs the USDA to "develop in cooperation with and participation by the public through conservation districts, State, tribal, and national organizations and agencies, and other appropriate means, a national soil and water conservation program".[189] It mandates that USDA shall create landowner and user guidance for private, tribal and non-federal lands upon analysis of different factors, including potential alternative measures for "conservation, protection, environmental improvement, and enhancement of soil and water resources".[190] This measure thus contains elements focused on preventing land degradation as well as remediation through, for example, the potential addition of organic waste materials.[191]

1.2.3.5.3. Cooperative Forestry Assistance Act of 1978

The Cooperative Forestry Assistance Act of 1978 authorises the Secretary of Agriculture to establish a forestry stewardship programme regarding non-Federal forest lands in the US and foreign forests. In addition to other objectives, the programme is intended to assist with "the prevention and control of insects and diseases affecting trees and forests, the prevention and control of rural fires", as well as encouraging timber production.[192] Forest degradation could lead to land degradation and increased potential for the soil erosion threat, as well as reduced air and water quality, biodiversity levels, carbon storage, etc. State foresters must conduct a state-wide forest assessment in order to be eligible to receive funds under the programme, identifying the condition of the forests, threats, and areas which are a priority both within the state and spanning multiple states.[193] Based on this assessment, a long-term forest resource strategy must be developed to outline how threats will be addressed and the necessary resources. This preventative law also provides for "financial, technical, educational, and related assistance" to State foresters and extension officers in order to improve their ability to provide "technical information, advice, and related assistance to private forest land owners and managers, vendors, forest resource operators, forest resource professionals, public agencies, and individuals".[194] The assistance is intended enable these actors to protect, maintain, enhance, restore, and preserve forest lands as well as many other objectives.

The Forest Legacy Program is a preventative mechanism that involves collaborative identification of "environmentally important forest areas that are threatened by conversion to nonforest uses" and use of conservation easements and similar approaches to protect the areas.[195] The Pest and Disease Revolving Loan Fund established under the law is another mechanism available to address forest degradation due to pest and disease infestation. Low-interest loans up to $5 million may be given to eligible local government units to purchase equipment necessary to "monitor, remove, dispose of, and replace infested trees".[196] Emergency reforestation assistance is a provision which allows landown-

189 16 U.S.C. § 2005.

190 Ibid.

191 Organic waste material addition under the programme includes "analysis of the practicability, desirability, and feasibility of collecting organic waste materials, including manure, crop and food wastes, industrial organic waste, municipal sewage sludge, logging and wood-manufacturing residues, and any other organic refuse, composting, or similarly treating such materials, transporting and placing such materials onto the land to improve soil tilth and fertility". Ibid.

192 16 U.S.C. § 2101.

193 16 U.S.C. § 2101a.

194 Ibid.

195 16 U.S.C. § 2103c.

196 16 U.S.C. § 2104a.

ers who lose over 35 % of their commercial tree stand due to weather damage or fire to be reimbursed for up to 65 % of the cost to re-establish the trees or provision of seedlings, which depends on the discretion of the Secretary of Agriculture.[197] Due to increasing potential damages resulting from climate change events, this provision could continue to rise in importance as a remediation provision. "Good neighbor agreements" are an example of a way in which different governmental levels can cooperate to carry out restoration activities.

1.2.3.5.4. Emergency Conservation Program

The Emergency Conservation Program authorises the Secretary of Agriculture to allocate payments to "agricultural producers who carry out emergency measures to control wind erosion on farmlands or to rehabilitate farmlands damaged by wind erosion, floods, hurricanes, or other natural disasters" as well as water conservation and enhancing measures.[198] The assistance with erosion control is aimed at avoiding danger to the land if it is left untreated, impacts on the land's productivity, unusual events and resulting damages, and very high rehabilitation costs which require government funds. In extreme cases, the "Secretary of Agriculture is authorized to undertake emergency measures, including the purchase of floodplain easements, for runoff retardation and soil-erosion prevention, in cooperation with landowners and land users".[199] Similarly, there is an Emergency Forest Restoration Program which addresses damages from natural disasters in nonindustrial private forest lands that need to be treated otherwise they may lead to impaired natural resources on the land or affect the future use.[200] The emergency measures also aim to restore forest health and resources on the land. As with other measures, there is a cost-share requirement for the private owner, so that 25 % must accompany the 75 % provided by the government.

1.2.3.5.5. Forest Landscape Restoration

The Collaborative Forest Landscape Restoration Program is a competitive process whereby the applicant outlines a restoration strategy for ecological treatments over a 10-year period of over 50,000 acres.[201] Forests under the National Forest System are the primary aim, but proposals may also include other federal lands and private lands. The landscape restoration strategy must be developed through a collaborative process with different interested persons and it must be transparent, which is a useful example of a participatory mechanism. The Program also has a fund which may pay up to 50 % of the restoration activity and monitoring costs for selected proposals.

1.2.3.5.6. National Landscape Conservation System

This preventative mechanism establishes a framework within the Bureau of Land Management agency for designating certain ecologically, culturally, or scientifically valuable landscapes as a "national conservation area", "wilderness study area", national monument, etc.[202] These landscapes are then conserved and protected, and restoration is also mentioned as a potential activity within the designated areas.

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197 16 U.S.C. § 2106a.
198 16 U.S.C. § 2201.
199 16 U.S.C. § 2203.
200 16 U.S.C. § 2206.
201 16 U.S.C. § 7303.
202 16 U.S.C. § 7202.

1.2.3.5.7. Healthy Forests Restoration Act of 2003

One of the objectives of the Healthy Forests Restoration Act of 2003 is to "protect, restore, and enhance forest ecosystem components", which is accompanied by aims to enhance protection of watersheds, address forest and rangeland threats, reduce wildfire risk, promote more of a systematic gathering of information about insect and disease infestations and other threats, etc.[203] Authorised hazardous fuel reduction projects are aimed at reducing potential contamination of water supply but also erosion as an impact of a fire. Priority is given to those projects which target at-risk communities or watersheds or with community wildfire protection plans, and primarily those on non-Federal lands. Each authorised hazardous fuel reduction project must have an environmental assessment or environmental impact statement prepared for it in accordance with NEPA (see Section 1.3.3.4), proposing alternative actions to the project as designed. The Healthy Forests Reserve Program was also created under the Act, which uses 10-year cost-share agreements, 30-year easements or permanent easements according to State law to restore and enhance private forest ecosystems in which endangered or potential candidates for endangered species are located and would benefit from restoration actions.[204] Stewardship contracting projects for "the national forests and the public lands that meet local and rural community needs" are possible with both public and private actors to provide services to achieve land management goals, such as soil productivity, wildlife habitat, restoration and maintenance of watersheds and resulting improvements in water quality.[205]

Conceptual approach: The laws under the Conservation Title 16 of the US Code employ many different conceptual approaches in the effort to prevent, remediate, and plan against land degradation. Some examples include:

- sustainable management contracts
- conservation programmes and long-term strategies
- low-interest loans, cost-share agreements, and reimbursement (e.g., for remediation actions)
- participatory planning
- protected area designation.

Suitability: None of the laws included under Title 16 are individually suitable for upscaling to the international level to implement the LDNW target. If taken separately, they present a fragmented approach to conservation and enhancement of various types of land owned by different actors and implemented by different stakeholders. However, the various mechanisms in the list above could be very useful to extract and integrate into a comprehensive scheme at the international level for implementing LDNW. In particular, the Collaborative Forest Landscape Restoration Program is an interesting example of remediation being conducted on a wide landscape scale over a decade (which is not a long period of time for forests, but is sufficient to show evidence of progress). It covers both public and private lands, the creative proposal for restoration measures must be developed through a transparent, participatory process with various stakeholders, and it includes a funding mechanism for successful proposals. Thus, there are many different mechanisms included in that one specific law which could be used more broadly on the international scale to contribute to the LDNW target.

203 16 U.S.C. § 6501.
204 16 U.S.C. §§ 6571-6572.
205 16 U.S.C. § 6591c.

1.2.3.6 Comprehensive Environmental Response, Compensation, and Liability Act of 1980

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) focuses on the release or threat of release of hazardous substances which "may present substantial danger to the public health or welfare or the environment".[206] Certain quantity thresholds are set by the EPA above which releases of the hazardous substance must be reported. In addition, owners or operators of hazardous waste storage facilities are required to provide notification of their existence, materials disposed, and potential releases that could occur.[207]

In accordance with the national contingency plan, federal action may be taken to respond to the release of hazardous substance in order to protect the public health, welfare, or the environment.[208] Based on a tax imposed on the chemical and petroleum industries, the Superfund program was included under CERCLA to make a significant amount of funds available to remedy abandoned toxic waste dumps. However, the tax has expired under the legislation and the fund has limited resources to carry out the objective of the law. The fund was intended for EPA to clean up such sites and require reimbursement from the responsible party, or the party may be compelled to clean up the site.[209] Basically, the former results in the government suing the responsible party after clean-up so quick action can be taken to address the hazardous environmental situation rather than taking time to identify the correct party and waiting for them to respond / initiate cleanup. Additionally, the responsible party may not be identified in some cases, so the fund allows for remedial action in spite of no contribution by the liable party. The Superfund may not be used to fund long-term actions to eliminate or significantly reduce the dangers associated with release of a hazardous substance, however, unless the site is included on the National Priorities List (NPL).[210]

Additionally, sites which are not included on the NPL or undergoing a removal action are regulated as "brownfield" sites under the statute, defined as "real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant".[211] Provisions for remedial action on these "eligible response sites" aim to "promote economic development or facilitate the creation of, preservation of, or addition to a park, a greenway, undeveloped property, recreational property, or other property used for nonprofit purposes" while at the same time protecting human health and the environment.[212] Funds are made available for this type of regenerative activity, which is carried out through site assessments, remediation, community involvement, among other actions.[213]

Conceptual approach: CERCLA is basically a remediation statute targeting sites where hazardous substances have been released and contaminated the environment. It uses the following mechanisms to remediate as well as indirectly prevent land degradation from occurring.

- Large amount of funds collected through a tax on the industries producing and selling the hazardous products which may lead to contamination, e.g., polluter-pays principle, but suffers from lack of funding now, limiting EPA options.
- Funds available for quick governmental response to hazardous environmental incident.

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206 42 USC § 9602.
207 42 USC §§ 9602-9603.
208 42 USC § 9604.
209 42 USC §§ 9611-9613; Executive Order No. 12580, Superfund Implementation.
210 42 USC § 9605.
211 42 USC § 9601(39).
212 42 USC § 9601(41).
213 42 USC § 9604.

- Cost-recovery mechanism for the government to claim reimbursement for cleanup by the responsible actor.
- Funds available for regeneration of a polluted or contaminated area for economic or recreational reuse.
- Notification of location of hazardous substances and reporting of releases.

Suitability: CERCLA is not a suitable piece of national legislation to upscale to the international level due to its limited focus primarily on remediation after contamination has already occurred. However, the mechanisms of taxing industrial actors to create a large fund for governmental response to contamination and cost-recovery from the responsible actors are useful to incorporate into a comprehensive approach to implementing the LDNW target. Additionally, remediation actions under the statute directly benefit contaminated soil but also indirectly prevent degradation by restoring brownfield sites for reuse, thereby reducing pressure to develop greenfields.

1.2.3.7 National Urban Policy and New Community Development

The National Urban Policy and New Community Development legislation mandates the development of a national urban policy which "encourage[s] the rational, orderly, efficient, and economic growth, development, and redevelopment of our States, metropolitan areas, cities, counties, towns, and communities in predominantly rural areas which demonstrate a special potential for accelerated growth".[214] It should also aim to improve energy use and conservation of energy and natural resources as well as ensure high quality urban development (e.g., adequate tax bases, community services, job opportunities). However, land use planning is under the jurisdiction of the states (except for federally-owned or controlled land) due to federalism and the decentralised regulation of land in the US. State legislatures then further delegate land use planning authority to the local government level. Therefore, the national act can only attempt to encourage and facilitate better land use planning.

State governments enact "enabling" legislation specifically authorizing local land use planning, and these state provisions may place certain requirements on the local government actions. For example, the California Planning and Zoning Law is an example of a state statute which delegates authority to local governments to regulate land uses (zoning ordinances, plans, etc.).[215] Specifically, Section 65030.1 on Growth Planning states: "The [State] Legislature also finds that decisions involving the future growth of the state, most of which are made and will continue to be made at the local level, should be guided by an effective planning process, including the local general plan, and should proceed within the framework of officially approved statewide goals and policies directed to land use, population growth and distribution, development, open space, resource preservation and utilization, air and water quality, and other related physical, social and economic development factors".[216]

At the local level, planning is typically carried out by planning commissions and zoning boards (quasi-judicial bodies) which hear challenges to land use restrictions, applications for zoning changes, etc. For instance, the city of Bakersfield in California has a "land use zoning ordinance of the City" adopted using the delegated power from the State which authorises the creation of a zoning plan for the city. The plan must "assist in providing a definite plan of development for the City and to guide, control and regulate the future growth of the City" as well as "protect the established character and the social and economic stability of agriculture, residential, commercial, industrial and other areas

214 42 USC § 4501.

215 California Government Code, Sections 65000-66037.

216 Ibid. at Section 65030.1.

within the City".[217] This requirement of development according to a comprehensive plan is important not only to ensure that "orderly and beneficial" development takes place rather than haphazard mixing of uses that may lead to conflicts (e.g., an industrial plan in the middle of a residential suburb), but it may help avoid rapid conversion of agricultural land due to urban sprawl leading to soil sealing. Vermont and Oregon are two states which provide good examples of comprehensive attempts to preserve rural land and prevent land degradation through urban sprawl.

These local planning mechanisms vary in terms of goals and objectives for the city's development but also include the ability to rezone or amend the comprehensive long-term plan. Atlanta, Georgia provides a good example of restoration of a contaminated railway corridor into a nature trail system which has sparked economic development and new affordable housing being built in numerous districts around the city.[218] However, it may be the case that in the consideration of whether to allow expansion into agriculturally zoned land, economic possibilities trump soil protection or nature conservation objectives in the planning or zoning commissions' decision. Prioritisation of nature protection and/or careful expansion into "undeveloped" agricultural or rural areas largely depends on the priorities of the persons who make up the planning and zoning commissions.

Since land use planning is designed and carried out at the local scale where comprehensive plans and objectives differ and decisions to stray from the plan simply need to be justified, this leads to diverse approaches and fragmented urban planning between urban areas in the US. Each city has an incentive to grow and consideration of the environmental effects of that growth (e.g., whether expanding commercial businesses along an urban corridor will cause increased loss of wildlife habitat or prime agricultural land) varies depending upon the priorities of the individual local planning authorities and cities. Regional approaches would be more effective in terms of determining where the most appropriate areas are for growth and allocating new development there. As seen above, the federal government would like to have a more strategic approach to urban planning, for which it has proposed a national urban policy, but generally states and local areas need only voluntarily abide by such a federal policy since it is beyond the federal government's jurisdiction.

Conceptual approach: Land use planning in the US contains measures such as:

- Comprehensive long-term planning of existing and future land uses.
- Zoning ordinances designating certain areas of the city for specific uses in accordance with the comprehensive land use plan.
- Decentralised delegation of power from state level to local commissions.
- Comprehensive measures to preserve greenfields and prevent unnecessary urban sprawl.
- Procedure for rezoning to change approved land use within a certain area.
- Economic, social, and environmental factors to be considered in deciding whether to allow rezoning.

Suitability: The land use planning approaches across the US may provide good examples in terms of zoning for specific uses to avoid conflicts, but they do not provide an approach which would be suitable for implementing the LDNW target. The highly decentralised nature of each local area planning its strategy for development does not lead to a coherent approach across the country but rather a highly contextual, sometimes fragmented approach ranging from highly controlled, central urban mixed-use planning to wide urban sprawl with expanding suburbs and greater infrastructure,

217 Bakersfield Municipal Code, Title 17, Zoning Ordinance, Section 17.02.030.

218 Atlanta was the winner of the EPA's National Award for Smart Growth Achievement: Overall Excellence in Smart Growth 2013. See EPA, Smart Growth, http://www.epa.gov/smartgrowth/awards/sg_awards_publication_2013.htm#overall_excellence.

transport, and lost agricultural/rural land issues. The examples provided at the local level in terms of preventing urban expansion into land or soils which are designated with a special status may be appropriate and useful measures to upscale for comprehensive prevention of land degradation on the international level.

1.3 Brazil

1.3.1 Introduction

When speaking of land degradation, the Amazon Forest is of particular importance. While it is not Brazil's only forest, it is an area with one of the greatest degrees of biodiversity in the world and covers around 49% of Brazil's total land area. The greatest threats to the Amazon include agricultural expansion, mining, and the growth of infrastructure. It has also been found that deforestation occurs in particular in areas in which property rights are unclear.[219] Desertification constitutes another threat and already affects or directly threatens 11% of Brazil's territory, including cropland areas. Desertification affects the Northeast where Brazil's drylands are located. It is estimated that economic losses resulting from land degradation or desertification could amount to US$ 800 million a year.[220]

Regarding land degradation, also Brazil's grasslands (such as the Cerrado (e.g. Campo limpo, Campos rupestres), the Pantanal, parts of the Mata Atlântica (Campos de altitude), and the Campos sulinos (South Brazilian grasslands)[221]) are under threat. Their destruction takes place mainly in regions with large potential for intensive agriculture, i.e. mostly soybean or rice production which causes considerable land degradation and soil erosion. In addition, also grasslands under grazing management are exposed to different degradation processes, including the invasion by non-native species.[222] Another problem is that in some cases, restoration requires the active destruction of grass in certain areas for which herbicides are used. Also, restoration is extremely expensive, ranging from US$3,000 to $20,000 per hectare, making vast restoration measures difficult to implement.[223]

In general, another problem is that law enforcement remains difficult in Brazil and the pressure of agribusiness is extremely high.[224]

As far as a commitment to the idea of a "land degradation neutral world" is concerned, Brazil has recently emphasised its view that this concept "cannot be translated into targets and indicators." Brazil further held that "its meaning is still controversial, since the feasibility of a land degradation

219 World Resources Institute, The Governance of Forest Initiatives, http://www.wri.org/our-work/project/governance-forests-initiative/brazil.

220 Mayrand, Karel, Marc Paquin, Stéphanie Dionne, From Boom to Dust? Agricultural trade liberalization, poverty, and desertification in rural drylands: The role of UNCCD, Prepared by Unisféra International Centre, 2008.

221 Hermann, Julia-Maria, Bianca O. Andrade, Ilsi I. Boldrini, Kathrin Kiehl, Anita Kirmer, Christiane Koch, Johannes Kollmann, Sebastian T. Meyer, Sandra C. Müller, Carlos Nabinger, Gabriele E. Pilger, José Pedro P. Trindade, Eduardo Vélez-Martin, Emer A. Walker, Deonir G. Zimmermann & Valério D. Pillar, Gerhard E. Overbeck, Restoration Ecology in Brazil – Time to Step Out of the Forest, Natureza & Conservação 11(1):92-95, July 2013.

222 Hermann, Julia-Maria, Bianca O. Andrade, Ilsi I. Boldrini et al., Restoration Ecology in Brazil – Time to Step Out of the Forest, Natureza & Conservação 11(1):92-95, July 2013.

223 Gromko, Duncan, Brazil's Atlantic Forest Faces Many Environmental Challenges, 2013, http://www.dcbureau.org/201305038493/bulldog-blog/brazils-atlantic-forest-faces-many-environmental-challenges.html.

224 Machado Granziera, Maria Luiza, Fernando Rei, The Protection of Biomes and the International Commitments and the New Law Brazilian Forest. La protección del bioma y los acuerdos internacionales en el nuevo Derecho forestal brasileño, Revista de Derecho de la Pontificia Universidad Católica de Valparaíso no.40, Valparaíso ago. 2013, http://www.scielo.cl/scielo.php?pid=S0718-68512013000100014&script=sci_arttext.

neutral world has not been technically confirmed and is being discussed under UNCCD." Thus Brazil added that it believes that "any target on land degradation should adopt a more concrete conceptual basis in order to be effectively translated into targets and indicators."[225]

1.3.2 Brazil's Legal System

The legal system in Brazil is based on a civil law tradition. It has been influenced by the French Code Civil and the German Civil Code (Bürgerliches Gesetzbuch).[226] Brazil's Federal Constitution (Constituição Federal; CF) is the supreme rule of the country.[227] It entered into force in 1988.

The Constitution determines unalterably[228] that Brazil shall be organised as a federal republic (República Federativa).[229] Brazil is made up of four entities: the Union (federal government; União Federal), the states, the federal district and the municipalities.[230] These entities have three governmental branches: the legislative, executive and judicial branch, except for the municipalities, which do not have a judicial branch.[231] Brazil has 26 federate states (Estados federados), a federal district and more than 5,500 municipalities.[232]

The federate states are entitled to adopt their own Constitutions and laws. According to Article 25 CF[233], this right, however, is subject to the principles established in the Federal Constitution. The municipalities are politically, administratively and financially autonomous.

225 10th Session of the Open Working Group on the Sustainable Development Goals, 31 March - 04 April, 2014, Cluster 6 - Conservation and Sustainable Use of Marine Resources, oceans and seas, http://sustainabledevelopment.un.org/owg10.html; Ecosystems and Biodiversity, 3 April, 2014, Statement by Brazil and Nicaragua, http://sustainabledevelopment.un.org/owg10.html.

226 Cp. Germany Trade and Invest, Recht kompakt – Brasilien, 2014, http://www.gtai.de/GTAI/Navigation/DE/Trade/Recht-Zoll/wirtschafts-und-steuerrecht,did=968530.html.

227 Organization of American States, The Brazilian Legal System, 2007, http://www.oas.org/juridico/mla/en/bra/en_bra-int-des-ordrjur.html.

228 Article 60 § 4 CF: "Não será objeto de deliberação a proposta de emenda tendente a abolir: I - a forma federativa de Estado [...]."

229 Cp. Oberheiden Law Group, Law of Brazil, http://www.lawofbrazil.com/legal-system/; Germany Trade and Invest, Recht kompakt – Brasilien, http://www.gtai.de/GTAI/Navigation/DE/Trade/Recht-Zoll/wirtschafts-und-steuerrecht,did=968530.html.

230 Cp. Article 1 CF: "A República Federativa do Brasil, formada pela união indissolúvel dos Estados e Municípios e do Distrito Federal, constitui-se em Estado Democrático de Direito e tem como fundamentos [...]."

231 Cp. Oberheiden Law Group, Law of Brazil, http://www.lawofbrazil.com/legal-system/; http://www.latia.org/index.php/brazil-legal-framework.

232 Cp. Oberheiden Law Group, Law of Brazil, http://www.lawofbrazil.com/legal-system/; http://www.gtai.de/GTAI/Navigation/DE/Trade/Recht-Zoll/wirtschafts-und-steuerrecht,did=968530.html.

233 Cp. Article 25 CF: "Os Estados organizam-se e regem-se pelas Constituições e leis que adotarem, observados os princípios desta Constituição."

Table 8: Overview of the Brazilian legislative system[234]

Federal level	National Congress (Federal Senate[235] and Chamber of Deputies[236])
State level	State Legislative Assembly (State Deputies)
Federal District Level	Legislative Chamber (Federal District Deputies)
Local level	City Council (City Councilmen)

According to Article 59 CF, Brazil's legislative system comprises the preparation of the following legal instruments:

- **Federal Constitution** (Constituição Federal; the supreme law)
  - The Federal Constitution is the supreme rule of the country.
- **Constitutional Amendments** (Emendas à Constituição)
  - Amendments to the Constitution must respect certain fundamental principles, including Brazil's federalistic structure and the separation of powers.
- **Complementary Laws** (Leis Complementares à Constituição; federal, state, Federal District, or local laws)
  - These laws supplement the Constitution and are of great relevance. They provide details but do not interfere with the constitutional text. They are admissible only when expressly authorised by the Constitution. They require an absolute majority of the two Houses of Congress.
- **Ordinary Laws** (Leis Ordinárias; either federal, state, Federal District, or local laws):
  - These laws deal with all subjects except those reserved to complementary laws. They originate from the legislative branch. Their purpose is to regulate "ordinary" aspects on the "daily agenda".
- **Delegated Laws** (Leis Delegadas; federal)
  - These laws are permissible in accordance with Article 68 CF. One branch (the delegating authority) can delegate an issue to another branch (the delegate). The delegate would not normally have the competence to prepare that law, but has acquired the power to do so by virtue of the delegation from the delegating authority. Delegated laws shall be drawn up the president, who shall request delegation from the National Congress. Delegated laws are approved by simple majority of the National Congress.[237]
- **Provisional Measures** (Medidas Provisórias)
  - Provisional Measures are sui generis legislative initiatives. They are issued by the president in important and urgent situations. Provisional measures are of a temporary nature and must be submitted to the National Congress for the leg-

234 http://www.llrx.com/features/brazil2002.htm.

235 Cp. Senado Federal, http://www.senado.gov.br/.

236 Cp. Câmara dos Deputados, http://www2.camara.leg.br/.

237 Carvalho de Figueirêdo Lopes, Laís Vanessa, Compendium of Third Sector Legislation – Analysis of the existing laws and regulation in Brazil, Paper presented at the 5a International Conference of the International Society for Third Sector Research - ISTR held at the University of Cape Town, South Africa, from July 7-10, 2002.

islative process. After their examination by the National Congress, they shall be converted into an ordinary law if approved.

- **Legislative Decrees** (Decretos Legislativos)
  - Legislative Decrees are acts of an administrative nature. They are initiatives within the exclusive competence of the National Congress and do not require the signature of the president.
- **Resolutions** (Resoluções)
  - Resolutions are initiatives linked to the exclusive activities of the National Congress. They do not require the signature of the president.[238]

International treaties and conventions must be approved by the National Congress to be enforced in Brazil.[239]

238 Cp. Oberheiden Law Group, Law of Brazil, http://www.lawofbrazil.com/; Organization of American States, The Brazilian Legal System, 2007, http://www.oas.org/juridico/mla/en/bra/en_bra-int-des-ordrjur.html; Hauser Global Law School Program, New York University School of Law, http://www.nyulawglobal.org/globalex/brazil.htm#_1.5_Brazilian_Legislative_System; OECD, Public Governance Reviews, Brazil's Supreme Audit Institution, The Audit of the Consolidated Year-end Government Report, 2013.

239 Cp. Latin American Trade & Investment Association (LATIA), Brazilian Legal Framework, http://www.latia.org/index.php/brazil-legal-framework; Kinoshita, Fernando, Ticiana Cesar de Noronha, A brief comparative analysis of the processualist of international acts in MERCOSUL until 2002, Âmbito Jurídico, Rio Grande, XIV, n. 91, ago 2011, http://www.ambito-juridico.com.br/site/?n_link=revista_artigos_leitura&artigo_id=11382&revista_caderno=19.

1.3.3 Important Laws

Below is Table 9 indicating the land degradation categories to which each relevant law identified in the EU/Germany case study applies.

Table 9: Matrix of Brazilian laws by category and soil threat

Laws	Prevention	Remediation/ Offsetting	Planning	Threats
Federal Constitution	X	X		Erosion, contamination
Contaminated Land, CONAMA Resolution 001/86	X		X	Erosion, contamination
National Environmental Policy (No. 6,938/1981)	X	X	X	Erosion, contamination
CONAMA Resolution 420/09		X		Contamination
Forest Code, Law No. 12,651/2012	X	X	X	Erosion, sealing, salinisation
Atlantic Forest Law, Law No. 11,428/2006	X	X	X	Erosion, sealing
Decree No. 59,263 on Contaminated Areas	X	X	X	Contamination
Brazilian Nature Conservation System (No. 9,985/2000)	X	X		Erosion
Water Law (No. 9,433/97)	X		X	Contamination
Waste Law (No. 12,305/2010)	X	X	X	Contamination
National Policy on Climate Change (No. 12,187/2009)		X		Erosion
Agricultural Policy (No. 8,171/1991)	X	X		Erosion

1.3.3.1 Brazil’s Federal Constitution - Constituiçao da Repùblica Federativa do Brasil de 1988[240]

Brazil’s Federal Constitution (CF) of 1988 reaffirmed the principles and guidelines that the National Environmental Policy of 1981 had established; this brought environmental issues to a constitutional level.[241] The Constitution dedicates an entire chapter to the protection of the environment. Under the Constitution, all individuals have the right to enjoy an ecologically balanced environment. The Constitution states that the environment is a common use asset, which both the government and society shall protect and preserve.[242] Furthermore, the Constitution also establishes a triple level of environmental liability: administrative, civil and criminal liability.[243]

Several provisions are of direct or indirect relevance for soil-related matters. The Constitution determines that certain areas (the Amazon Rainforest, the Atlantic Rainforest, the Mountain Range of the Sea (Serra do Mar), the Wetland crossing the States of Mato Grosso do Sul and Mato Grosso (Pantanal Matogrossense) and the Coastal Zone) are national patrimony and shall be used in a way, which ensures the preservation of the environment (Article 225 Paragraph 4 CF[244]).[245]

Pursuant to Article 23 CF, the union, the states, the federal district and the municipalities, in common, have the power to protect the environment and to fight pollution in any of its forms, to preserve the forests, fauna and flora and to promote agriculture and organise the supply of foodstuff.[246]

Article 24 CF determines that the union, the states and the federal district have the power to legislate concurrently, inter alia, on forests, hunting, fishing, fauna, preservation of nature, defense of the soil and natural resources, protection of the environment and control of pollution.[247]

Article 170 CF deems environmental protection as an underlying principle of the Brazilian economic order.[248] It establishes that the economic order of Brazil shall have due regard for, inter alia, envi-

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240 Constituiçao da Repùblica Federativa do Brasil de 1988, http://www.planalto.gov.br/ccivil_03/constituicao/Constituicao.htm.

241 Machado Granziera, Maria Luiza, Fernando Rei, The Protection of Biomes and the International Commitments and the New Law Brazilian Forest. La protección del bioma y los acuerdos internacionales en el nuevo Derecho forestal brasileño, Revista de Derecho de la Pontificia Universidad Católica de Valparaíso no.40, Valparaíso ago. 2013, http://www.scielo.cl/scielo.php?pid=S0718-68512013000100014&script=sci_arttext.

242 Doria, Maria Alice, Brazil, Doria, Jacobina e Gondinho Advogados, http://latinlawyer.com/reference/topics/51/jurisdictions/6/brazil/.

243 Sant’Anna, Luiz Fernando Henry, Julia Rabinovici and Marise Hosomi Spitzeck, Environment Brazil, Legal and regulatory framework, http://latinlawyer.com/reference/article/40585/brazil/; Article 225 Paragraph 3 CF determines that procedures and activities considered as harmful to the environment shall subject the violators, be they individuals or legal entities, to penal and administrative sanctions, cp. Constitution of the Federative Republic of Brazil, 3rd Edition, Bibliotheka Digital da Camara dos Deputados, Centro de Documentaçao de Bibliotheca, Coordenaçao de Bibliotheca, http://bd.camara.gov.br.

244 Article 225 Paragraph 4 CF: “The Brazilian Amazonian Forest, the Atlantic Forest, the Serra do Mar, the Pantanal Mato-Grossense and the coastal zone are part of the national patrimony, and they shall be used, as provided by law, under conditions which ensure the preservation of the environment, therein included the use of mineral resources”, cp. Constitution of the Federative Republic of Brazil, 3rd Edition, Bibliotheka Digital da Camara dos Deputados, Centro de Documentaçao de Bibliotheca, Coordenaçao de Bibliotheca, http://bd.camara.gov.br.

245 Sant’Anna, Luiz Fernando Henry, Julia Rabinovici and Marise Hosomi Spitzeck, Environment Brazil, Legal and regulatory framework, http://latinlawyer.com/reference/article/40585/brazil/.

246 Constitution of the Federative Republic of Brazil, 3rd Edition, Bibliotheka Digital da Camara dos Deputados, Centro de Documentaçao de Bibliotheca, Coordenaçao de Bibliotheca, http://bd.camara.gov.br.

247 Constitution of the Federative Republic of Brazil, 3rd Edition, Bibliotheka Digital da Camara dos Deputados, Centro de Documentaçao de Bibliotheca, Coordenaçao de Bibliotheca, http://bd.camara.gov.br; It has been held that “[t]he exclusion of the municipalities from this list has created uncertainties in the legitimacy of environmental regulation by local authorities in Brazil”, Luiz Fernando Henry Sant’Anna, Julia Rabinovici and Marise Hosomi Spitzeck, Environment Brazil, Legal and regulatory framework, http://latinlawyer.com/reference/article/40585/brazil/.

ronmental protection, which may include differentiated treatment in accordance with the environmental impact of goods and services and of their respective production and delivery processes.[249]

The Constitution also establishes in its Articles 184f that the Union has, under certain conditions, the power to expropriate against prior and fair compensation a rural property, which is not performing its social function. A rural property meets the social function when it complies amongst others with the following requirements: rational and adequate use, adequate use of available natural resources and preservation of the environment (cp. Article 186 CF).

Article 225 CF addresses various aspects of environmental protection and is in that regard the most important constitutional provision. Generally, it establishes that the public has the right to a balanced environment. Furthermore it establishes “a general duty for the government and citizens to protect and defend the quality of the environment for present and future generations”.[250] It lays out several rules that directly or indirectly affect the use of soil.

Importantly, it determines that it is generally incumbent upon the Government to preserve and restore the essential ecological processes and provide for the ecological treatment of species and ecosystems, preserve the diversity and integrity of the genetic patrimony of the country and to control entities engaged in research and manipulation of genetic material (Paragraph 1 I and II). The Ordinary Laws No. 9,985/2000[251] and No. 11,105/2005[252] establish detailed rules in that regard.

Furthermore, Article 225 obliges the Government to define territorial spaces, which are to receive special protection. It also determines that an environmental impact assessment must be carried out before the installation of works and activities, which may potentially cause significant degradation of the environment. This impact assessment shall be made public (Paragraph 1 IV).

In the context of mining, Article 225 CF determines that those who exploit mineral resources shall be required to restore degraded environment (Paragraph 2).[253]

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248 Luiz Fernando Henry Sant’Anna, Julia Rabinovici and Marise Hosomi Spitzeck, Environment Brazil, Legal and regulatory framework, http://latinlawyer.com/reference/article/40585/brazil/.

249 Constitution of the Federative Republic of Brazil, 3rd Edition, Bibliotheka Digital da Camara dos Deputados, Centro de Documentaçao de Bibliotheca, Coordenaçao de Bibliotheca, http://bd.camara.gov.br.

250 Luiz Fernando Henry Sant’Anna, Julia Rabinovici and Marise Hosomi Spitzeck, Environment Brazil, Legal and regulatory framework, http://latinlawyer.com/reference/article/40585/brazil/; Article 225 CF: “All have the right to an ecologically balanced environment, which is an asset of common use and essential to a healthy quality of life, and both the Government and the community shall have the duty to defend and preserve it for present and future generations”, Constitution of the Federative Republic of Brazil, 3rd Edition, Bibliotheka Digital da Camara dos Deputados, Centro de Documentaçao de Bibliotheca, Coordenaçao de Bibliotheca, http://bd.camara.gov.br.

251 Law establishing the Sistema Nacional de Unidades de Conservação da Natureza, see http://www.planalto.gov.br/ccivil_03/LEIS/L9985.htm and http://legislacao.planalto.gov.br/legisla/legislacao.nsf/Viw_Identificacao/lei%209.985-2000?OpenDocument.

252 Lei No. 11,105, de 24 de Março de 2005, http://www.planalto.gov.br/ccivil_03/_Ato2004-2006/2005/Lei/L11105.htm and http://legislacao.planalto.gov.br/legisla/legislacao.nsf/Viw_Identificacao/lei%2011.105-2005?OpenDocument.

253 Cp. Constitution of the Federative Republic of Brazil, 3rd Edition, Bibliotheka Digital da Camara dos Deputados, Centro de Documentaçao de Bibliotheca, Coordenaçao de Bibliotheca, http://bd.camara.gov.br; cp. also USAid, Country Profile, Property Rights and Resource Governance, Brazil, 2011, http://landwise.landesa.org/record/1290.

Conceptual approach: The Federal Constitution is to provide the general legislative order for Brazil. It provides broad concepts, such as the principle that environmental protection is deemed an underlying principle of the Brazilian economic order (cp. Article 24 CF). The Constitution requires further specifications through specific laws. More detailed laws implementing the Constitution's broad approaches are thus adopted. Examples are the Laws No. 9,985/2000 establishing the Sistema Nacional de Unidades de Conservação da Natureza or CONAMA Resolution 001/86, which regulates environmental impacts as required by Article 225 Paragraph 1 IV CF (see below). Also the basic approach of identifying areas that are held to be national patrimony (e.g. the Atlantic rainforest) is implemented through more specific laws (e.g. the Atlantic Forest law, see below Law No. 11,428/2006).

Suitability: With its protection of specific regions, the Federal Constitution, for example, is tailored to the national level and its specific regional circumstances. Brazil's Constitution is also too broad, i.e. not specific enough to fill gaps existing at the international level in view of land degradation. Also aspects such as environmental impact assessments are already addressed internationally (mentioned, for example, in the UNCCD and the CBD).

1.3.3.1.1. CONAMA Resolution 001/86

The Federal Constitution requires the development of an environmental impact assessment for projects potentially having adverse impacts on the environment (Article 225 Paragraph 1 IV CF). This is an important instrument for the prevention of environmental harm, including soil degradation.

Details are regulated by CONAMA Resolution 001/86[254], which holds that the environmental impact assessment is required for activities such as pipelines for oil, gas and minerals or mineral extraction. The environmental impact assessment process includes the development of an environmental impact study (Estudo de Impactos Ambientais, EIA) and an environmental impact report (Relatório de Impactos Ambientais, RIMA).[255] The EIA must be carried out by a legally qualified professional, and shall be accompanied by the RIMA, which is a summary of the EIA.[256] The RIMA shall be made available to the public.

According to CONAMA Resolution 001/86, the EIA must meet certain general guidelines, including identifying and assessing, on a continued basis, the environmental impact on environmental resources caused during the implementation and operation of the respective activity (cp. Article 4 of CONAMA Resolution 001/86).[257] Environmental impacts are defined in Article 1 of CONAMA Resolution 001/86. They cover any change to the physical, chemical or biological properties of the environment directly or indirectly resulting from human activities and which affect aspects such as health, safety and welfare of the population, social and economic activities, the biota or the quality of environmental resources, which includes soil.

The EIA must include analyses of alternatives to the project. The EIA is an important aspect of the licensing procedure.[258]

254 Resoluçao CONAMA No. 001, de 23 Janeiro de 1986, http://www.mma.gov.br/port/conama/res/res86/res0186.html.

255 Cp. Leibniz Institute of Ecological and Regional Development (IÖR), International Approaches to compensation for Impacts on Biological Diversity, Final Report 2009.

256 Luiz Fernando Henry Sant'Anna, Julia Rabinovici and Marise Hosomi Spitzeck, Environment Brazil, Legal and regulatory framework, http://latinlawyer.com/reference/article/40585/brazil/.

257 Practical Law, Environmental law and practice in Brazil: overview, http://us.practicallaw.com/2-508-8459.

258 See below.

Conceptual approach: CONAMA Resolution 001/86 regulates environmental impact assessments but not specifically in view of land but rather in view of environmental resources in general. It focuses on activities that can have hazardous impacts on such resources.

Suitability: Environmental impact assessments are already discussed intensively internationally; the obligation to undertake an environmental impact assessment where there is a risk that an activity may have negative transboundary effects has been found by the ICJ to constitute a requirement under general international law.[259] Environmental impact assessments are also mentioned, for example, in the UNCCD and the CBD. Given that the environmental protection scope is also rather broad, the added value and suitability of CONAMA Resolution 001/86 for upscaling purposes is limited.

1.3.3.2 National Environment Policy

Brazil's National Environmental Policy (Law No. 6,938/1981) is an important environmental protection law. Overall, the Law is held to constitute a milestone for environmental protection.[260] It provides an integrated approach to environmental protection, in contrast to prior laws that were, historically, scattered and regulated the exploitation of specific types of natural resources (e.g. the Water Code of 1934 - Decree No. 24,643/1934, Forest Code of 1965 - Law No. 4,771/1965 or the Mining Code of 1967 - Decree No. 227/1967).

The National Environmental Policy's main objectives relate to the preservation and restoration of environmental resources (cp. Article 2 and Article 4 of Law No. 6,938/81[261]). Environmental resources include soil and subsoil (cp. Art 3 V of Law No. 6,938/81[262]). Further objectives are the rational use of environmental resources for present and future generations and ensuring the compatibility of economic and social development with the preservation of the quality of the environment.[263] The restoration of degraded land has been included in the National Environmental Policy as one of the law's principles.[264]

The National Environmental Policy provides a regulatory framework for aspects such as "environmental standards, zoning, licensing, environmental impact assessments and penalties for non-compliance with environmental provisions".[265] With the establishment of the National Environmental System (O Sistema Nacional do Meio Ambiente, SISNAMA[266]), Law No. 6,938/1981 determines governmental bodies and defines their respective institutional powers and duties. These bodies include the Federal Environmental Agency (Instituto Brasileiro do Meio Ambiente e dos Recursos

259 Cp. ICJ, Case Concerning Pulp Mills on the River Uruguay (Argentina v. Uruguay), Judgment of 20 April 2010.

260 Machado Granziera, Maria Luiza, Fernando Rei, The Protection of Biomes and the International Commitments and the New Law Brazilian Forest. La protección del bioma y los acuerdos internacionales en el nuevo Derecho forestal brasileño, Revista de Derecho de la Pontificia Universidad Católica de Valparaíso no.40, Valparaíso ago. 2013, http://www.scielo.cl/scielo.php?pid=S0718-68512013000100014&script=sci_arttext.

261 Article 2 Law No. 6.938/81: "A Política Nacional do Meio Ambiente tem por objetivo a preservação, melhoria e recuperação da qualidade ambiental propícia à vida [...]."

262 Art 3 V of Law No. 6,938/81: "Recursos ambientais: a atmosfera, as águas interiores, superficiais e subterrâneas, os estuários, o mar territorial, o solo, o subsolo, os elementos da biosfera, a fauna e a flora."

263 Machado Granziera, Maria Luiza, Fernando Rei, The Protection of Biomes and the International Commitments and the New Law Brazilian Forest. La protección del bioma y los acuerdos internacionales en el nuevo Derecho forestal brasileño, Revista de Derecho de la Pontificia Universidad Católica de Valparaíso no.40, Valparaíso ago. 2013, http://www.scielo.cl/scielo.php?pid=S0718-68512013000100014&script=sci_arttext.

264 Hermann, Julia-Maria, Bianca O. Andrade, Ilsi I. Boldrini et al., Restoration Ecology in Brazil – Time to Step Out of the Forest, Natureza & Conservação 11(1):92-95, July 2013.

265 Luiz Fernando Henry Sant'Anna, Julia Rabinovici and Marise Hosomi Spitzeck, Environment Brazil, Legal and regulatory framework, http://latinlawyer.com/reference/article/40585/brazil/.

266 SISNAMA – Sistema Nacional do Meio Ambiente, http://www.mma.gov.br/port/conama/estr1.cfm.

Naturais Renováveis, IBAMA[267]), which is in charge of law enforcement and the National Council for the Environment (Conselho Nacional do Meio Ambiente, CONAMA[268]), which is in charge of creation of regulatory standards (cp. Article 6 of Law No. 6,938/81). The Ministry of the Environment[269] is responsible for aspects such as environmental preservation, conservation and inspection but also the implementation of international environmental agreements.

Several Articles regulate the rights and duties of individuals and legal persons in view of environmental protection. Articles 14f of Law No. 6,938/81 determine the liability for environmental degradation and determine fines for caused environmental damage. Article 4 of Law No. 6,938/81 determines the obligation to recover and/or indemnify the damage caused by the use of environmental resources for economic purposes. Environmental degradation is defined in Article 3 of Law No. 6,938/81 in which it is stated that all negative changes to environmental characteristics constitute environmental degradation (Art 3 II). Article 2 of Law No. 6,938/81 further determines that the soil and subsoil (and water and air) shall be used rationally (Art 2 II).

Conceptual approach: Brazil's National Environmental Policy stipulated in Law No. 6,938/1981 provides an integrated approach to the preservation and restoration of environmental resources. It addresses "environmental degradation" which includes but is not tailored to land degradation. Furthermore, it regulates liability and provides for a licensing system for potentially harmful activities.

Suitability: While one of the National Environmental Policy's principles is the restoration of environmental resources, including soil and subsoil, its suitability as a model for the international level is also limited. It again is rather broad, covering all environmental resources. The licensing system could fill a gap identified at the international level. It is, however, designed for a national system. Furthermore, it is not an instrument specifically addressing land degradation.

Generally, it is tailored to the national level and is too general in terms of environmental protection to provide a useful and suitable example for the international level.

1.3.3.2.1. Licensing

An important instrument of Law No. 6,938/81 is its regulation of hazardous activities to prevent the occurrence of environmental degradation (cp. Article 9 IV and Article 10 of Law No. 6,938/81). It sets up a complex licensing system for hazardous activities. For activities that have the potential to cause environmental damage, a license is required for the construction, establishment and operation of activities, which involve the use of natural resources, including soil and subsoil, if these activities have the potential to cause environmental damage.[270]

Complementary Law No. 140/2011 (which implements Article 23 CF, which establishes shared jurisdiction (competência comum) among the three levels of government over environmental issues[271]) and CONAMA Resolutions No. 237/2007 and No.01/1986 provide details of the three-step licensing system, regulating aspects such as the licensing procedures as such and the jurisdiction of environment agencies.[272]

267 IBAMA, http://www.ibama.gov.br/.

268 O que é o CONAMA?, http://www.mma.gov.br/port/conama/estr.cfm.

269 CONAMA – Conselho Nacional do Meio Ambiente, http://www.mma.gov.br/port/conama/.

270 Cp. Doria, Maria Alice, Brazil, Doria, Jacobina e Gondinho Advogados, http://latinlawyer.com/reference/topics/51/jurisdictions/6/brazil/.

271 Beveridge & Diamond PC, Brazil Highlights, http://www.bdlaw.com/news-1276.html.

272 Miguel, Carlos de (contributing author), Getting the deal through, Environment in 21 jurisdictions worldwide, 2014.

CONAMA Resolution 237/97 defines the details of the three-step licensing system. There are three consecutive environmental licenses:

1. Preliminary License: This license is granted at the preliminary stage of the enterprise or activity. It covers the envisioned location and conception, preliminarily certifies its environmental feasibility and establishes basic requirements and conditions to be met during the following stages of the project’s implementation.[273] This stage may also require an Environmental Impact Assessment.[274]
2. Installation License: This second license authorises the construction or expansion of the facility or activity in accordance with the previously determined specifications.
3. Operation License: The operation license authorises the operation of the activity or enterprise after effective compliance with the conditions of the preliminary and installation licenses has been confirmed.[275]

Whenever the company changes its facilities or acquires new equipment, a new environmental licence is required.[276] Municipalities are in charge of the licensing if the environmental impacts of the company remain local. In contrast, the federal government has jurisdiction if the environmental impacts extend beyond state borders. If this is not the case, a state government has jurisdiction over the licensing.[277]

1.3.3.3 Contaminated land - CONAMA Resolution 420/09

There are Resolutions and Decrees in place regulating aspects such as liability for contaminated land.[278] Generally, a strict liability scheme applies to the environmental contamination of soil. This means that no guilt has to be proven against a polluter to enforce the obligation of recovering the environment. Generally, the polluter concept is broad and covers anyone who directly or indirectly contributed to the damage. Furthermore, the ownership of polluted land and natural resources is subject to environmental civil liability. Thus, liability is based on the contaminated resource as such rather than on fault for contamination so that the landowner is liable for cleaning up damage that existed at the time the land was acquired.[279] A causal connection to the polluter's activity is sufficient for polluter liability. The owner can, however, exercise his right of recourse against the party from whom he acquired the land if the owner is capable of proving that the pollution occurred before the land was acquired.[280]

The technical rule CONAMA Resolution 420/09 establishes a standard procedure that aims to ensure the identification, public disclosure and remediation of contaminated sites.[281] Contamination refers to certain concentrations of chemical substances in the air, water or soil resulting from human

273 Doria, Maria Alice, Brazil, Doria, Jacobina e Gondinho Advogados, http://latinlawyer.com/reference/topics/51/jurisdictions/6/brazil/.

274 See below.

275 Miguel, Carlos de (contributing author), Getting the deal through, Environment in 21 jurisdictions worldwide, 2014.

276 Practical Law, Environmental law and practice in Brazil: overview, http://us.practicallaw.com/2-508-8459.

277 Cp. Practical Law, Environmental law and practice in Brazil: overview, http://us.practicallaw.com/2-508-8459.

278 Miguel, Carlos de (contributing author), Getting the deal through, Environment in 21 jurisdictions worldwide, 2014.

279 Doria, Maria Alice, Brazil, Doria, Jacobina e Gondinho Advogados, http://latinlawyer.com/reference/topics/51/jurisdictions/6/brazil/.

280 Practical Law, Environmental law and practice in Brazil: overview, http://us.practicallaw.com/2-508-8459.

281 Cp. e.g. Miguel, Carlos de (contributing author), Getting the deal through, Environment in 21 jurisdictions worldwide, 2014.

activities and that restrict the use of the respective environmental resource (cp. Article 6 V CONAMA Resolution 420/09).

The regulation sets out the criteria and guiding principles to evaluate the soil quality in terms of contaminating chemicals. In the event that substances are detected that have the potential of causing risks to human health, the relevant agencies must undertake actions to protect the exposed population (Article 17 IV of CONAMA Resolution No. 420/2009).[282] Facilities with the potential to pollute may be required to establish soil-monitoring programmes (Art. 14 of CONAMA No. 420/2009).

At the state level, São Paulo State Law 13,577/09 ensures that contaminated sites are adequately identified, publicly disclosed and remediated.[283]

Conceptual approach: CONAMA Resolution No. 420/2009 deals with contamination of land but with a focus on the protection of human health. It also regulates procedures for the disclosure of contaminated sites.

Suitability: Procedures established by CONAMA Resolution No. 420/2009 to register contaminated sites could potentially fill a gap at the international level. Also soil monitoring could provide a useful tool.

1.3.3.4 Forest Code

Forest protection measures date back to at least 1802. In 1921, the Servico Florestal do Brazil was created. Its objective was to restore and preserve the national forest.[284] The "old" Forest Code No. 4,771/1965 established the concepts of permanent preservation areas (APP) and legal forest reserves (LFR). Permanent preservation areas include the protection of soils and are defined as areas, whether or not they are covered by native vegetation, that have "the environmental role of preserving the water resources, the landscape, the geological stability, the biodiversity and the genetic flow of fauna and flora in addition to protecting the soil and ensuring the well-being of human populations". Due to their great environmental importance, permanent preservation areas have to be maintained as an "untouchable space with a permanent environmental function".[285] Legal forest reserves, in contrast, are areas in rural properties for which a certain amount of land must be maintained under native vegetation. The forest reserves shall assist the conservation and rehabilitation of ecological processes and promote the conservation of biodiversity, as well as provide shelter and protection to flora and fauna. For sustainable management of forest, a forest service (Serviço Florestal Brasileiro) has been established by Law No. 11,284/2006.

The "new" Forest Code Law No. 12,651/12[286], a revision of the 1965 Forest Code, includes the same general concepts but stipulates different requirements. Law No. 12,651/12 establishes general standards for the protection and sustainable use of forests and other forms of native vegetation in harmony with the promotion of economic development. It adheres to principles such as the recognition of existing forests in the country and other forms of native vegetation as goods of common interest to all inhabitants of the country, the assertion of sovereign commitment of Brazil to the preserva-

282 Practical Law, Environmental law and practice in Brazil: overview, http://us.practicallaw.com/2-508-8459.

283 Doria, Maria Alice, Brazil, Doria, Jacobina e Gondinho Advogados, http://latinlawyer.com/reference/topics/51/jurisdictions/6/brazil/.

284 Avanzi, Junior Cesar, Luís Antônio Coimbra Borges, Ricardo Carvalho, Proteçao Legal do Solo e dos Recursos Hidricos no Brasil, 2009.

285 Leibniz Institute of Ecological and Regional Development (IÖR), International Approaches to compensation for Impacts on Biological Diversity, Final Report 2009.

286 Lei No. 12.651, de 25 de Maio de 2012, http://presrepublica.jusbrasil.com.br/legislacao/1032082/lei-12651-12.

tion of their forests and other forms of native vegetation, biodiversity, soil and water resources, the integrity of the climate system for the well-being of present and future generations or the creation and mobilisation of legal and economic incentives to encourage the conservation and recovery of native vegetation, and to promote the development of sustainable productive activities (cp. Article 1 I, II and VIII of Law No. 12,651/12).

Law No. 12,651/12 reaffirms the importance of the strategic role of farming and the role of forests and other forms of native vegetation for sustainability, economic growth or the improvement of the quality of life of the Brazilian population (cp. Article 1a I of Law No. 12,651/12). Overall, the Forest Code's objective it to provide general rules for the protection of vegetation, areas of permanent preservation and legal reserve areas, regulate forest exploitation, the supply of forest raw material, control the origin of forest products and the control and prevention of forest fires.

In the new Forest Code, APPs and LFRs are defined in Article 3 II and III of Law No. 12,651/12. Soil affected by salinisation is addressed and defined in Article 3 XIV and XV of Law No. 12,651/12. For certain coastal areas, further details are provided in Law 12,727, de 17 de Outubro de 2012.

Article 6 of Law No. 12,651/12 regulates the prevention of soil erosion in permanent preservation areas. Pursuant to Article 61-A V of Law No. 12,651/12, the government must verify the existence of erosion threats and determine mitigation measures.

The adoption of the new Forest Code has been broadly criticised. It is viewed by many as decreasing the environmental protection standards applicable to the national forests in comparison to the old Forest Code. Forests are, ultimately, the most important factor in view of land degradation in Brazil, given that deforestation considerably contributes to land degradation.

The revised Code has, for example, decreased the amount of land that a landowner has to retain as natural forest, and decreased, for example, the size of forest belts around steams, watercourses and other water bodies. Areas that were previously considered to be unusable (e.g. flooded forests (igapós) and lowlands forests (várzeas) are no longer considered to be APPs; this concerns an area of more than 400,000 km2.[287] This is viewed by some to be a concession to Brazil's powerful farm lobby[288] and a result of the long-standing conflict between environmentalists and "ruralistas", i.e. the farmers and land owners.[289] Studies found that after the adoption of the new Forest Code, deforestation rates increased by 28% between August 2012 and July 2013.[290] The revision is also held to cause increased soil pollution and, in general, the "impoverishment of one of the greatest biodiversity areas of the planet".[291]

287 Morim Novaes, Roberto Leonan, Renan de França Souza, Legalizing environmental exploitation in Brazil: the retreat of public policies for biodiversity protection, Tropical Conservation Science, Vol.6 (4):477-483, 2013.

288 Gromko, Duncan, Brazil's Atlantic Forest Faces Many Environmental Challenges, 2013, http://www.dcbureau.org/201305038493/bulldog-blog/brazils-atlantic-forest-faces-many-environmental-challenges.html.

289 Ruralistas are "composed of large agribusiness producers allied with the majority of deputies and senators, who are opponents of the environmental agenda", Morim Novaes, Roberto Leonan, Renan de França Souza, Legalizing environmental exploitation in Brazil: the retreat of public policies for biodiversity protection, Tropical Conservation Science, Vol.6 (4):477-483, 2013.

290 Purdom, Rebecca, Kelly Nokes, Brazil Repeals Forest Code and Deforestation Accelerates, Environmental Protection, 8 January 2014, http://eponline.com/articles/2014/01/08/brazil-repeals-forest-code-and-deforestation-accelerates.aspx.

291 Morim Novaes, Roberto Leonan, Renan de França Souza, Legalizing environmental exploitation in Brazil: the retreat of public policies for biodiversity protection, Tropical Conservation Science, Vol.6 (4):477-483, 2013.

In addition to reducing the area subject to special protection, the provision of amnesty for illegal deforestation that took place before July 2008 is criticised. While previously 80% of such illegally logged land needed to be reforested, the new law now only requires the recovery of 50%. This is even held to incentivise more illegal logging.[292]

However, regardless of the negative trend, some aspects of the new law have been rated positively. One measure is the introduction of Forest Reserve Credits (Cotas de Reserva Ambiental, CRAs; cp. Article 5 I of Law No. 12,651/12). The CRAs allow for legal reserve offsetting in rural properties. CRAs can compensate for the lack of legal reserve in one rural property provided it is located in the same biome and in the same State where the CRAs are created.[293]

Conceptual approach: Given that large areas in Brazil are covered by forests, specific regulations are required, for example regarding deforestation – but also forest-related specific threats such as fires (cp. Chapter IX). Important concepts of the law are the established permanent preservation areas (APP) and legal forest reserves (LFR).

Suitability: Certain elements of the Forest Code, such as rules on APPs and LFRs or the introduction of Forest Reserve Credits, could be used as models for international approaches to fill identified gaps.

While the Forest Code Law No. 12,651/12 is undoubtedly one of the most important environmentally relevant laws, it is not suitable for the purpose of contributing to the LDNW. The Forest Code's focus on forests and its regulation of deforestation, the protection of vegetation, the sustainable use of forests etc. limits its suitability. In addition, from a practical point of view, the discussions about the revision of the Forest Code have made it a contentious issue subject to criticism.

1.3.3.5 Atlantic Forest Law, Law No. 11,428/2006

The Atlantic Forest Law[294] regulates the use and protection of the Atlantic Forest, which is – according to the Federal Constitution – national patrimony and thus shall generally be used in a way that ensures the preservation of the environment (Article 225 Paragraph 4 CF[295]).[296] The Law provides a number of interesting approaches worth mentioning. It is, however, tailored to forests and thus not a comprehensive approach to land degradation.

Pursuant to Article 1 Law No. 11,428/2006, the law aims to conserve, protect, regenerate and regulate the utilization of the Atlantic Forest. It focuses on native vegetation and restricts the further removal or degradation of this vegetation in the covered area.

Article 6 Law No. 11,428/2006 determines that the protection and utilisation of the Atlantic Forest shall promote sustainable development, safeguard biodiversity, human health, scenic, aesthetic and tourism values, the water regime and social stability. It also addresses issues such as the polluter

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292 Purdom, Rebecca, Kelly Nokes, Brazil Repeals Forest Code and Deforestation Accelerates, Environmental Protection, 8 January 2014, http://eponline.com/articles/2014/01/08/brazil-repeals-forest-code-and-deforestation-accelerates.aspx.

293 Cp. Bolsa Verde do Rio de Janeiro, Rio de Janeiro Environmental Exchange, Operational Report, 2011 – 2013.

294 Lei No. 11,428, de 22 Dezembro de 2006, http://www.planalto.gov.br/ccivil_03/_ato2004-2006/2006/lei/l11428.htm.

295 Article 225 Paragraph 4 CF: "The Brazilian Amazonian Forest, the Atlantic Forest, the Serra do Mar, the Pantanal Mato-Grossense and the coastal zone are part of the national patrimony, and they shall be used, as provided by law, under conditions which ensure the preservation of the environment, therein included the use of mineral resources", cp. Constitution of the Federative Republic of Brazil, 3rd Edition, Bibliotheka Digital da Camara dos Deputados, Centro de Documentaçao de Bibliotheca, Coordenaçao de Bibliotheca, http://bd.camara.gov.br, see above.

296 Sant'Anna, Luiz Fernando Henry, Julia Rabinovici and Marise Hosomi Spitzeck, Environment Brazil, Legal and regulatory framework, http://latinlawyer.com/reference/article/40585/brazil/.

pays principle and intergenerational equity. Small farmers and traditional communities are also specifically addressed (and defined in Article 3 paras. 1 and 2 of Law No. 11,428/2006).

A distinctive feature of the law is that it distinguishes different stages of regeneration (cp. Articles 20 et seqq. Law No. 11,428/2006). Pursuant to Article 11 Law No. 11,428/2006, the cutting and removal of vegetation in medium or advanced stages of regeneration are restricted. Furthermore, the law states that the removal of vegetation shall primarily take place on land that is already substantially degraded (cp. Article 12 of Law No. 11,428/2006). The cutting and removal of primary vegetation is only allowed under exceptional circumstances when necessary to carry out investment projects or public utility activities, scientific research and preservationist practices (cp. Article 12 of Law No. 11,428/2006).

In Articles 36 et seqq. of Law No. 11,428/2006, a Restoration Fund is established. Its purpose is to finance environmental restoration projects and scientific research.

Conceptual approach: The Atlantic Forest Law's conceptual approach is to regulate a specific area and its status as national patrimony, preserving its original state as far as possible. The Law regulates the utilization of this environmental resource by limiting the use under specific circumstances, e.g. the cutting and removal of primary vegetation.

Suitability: Rules such as that stating that the removal of vegetation shall primarily take place on land that is already substantially degraded (cp. Article 12 of Law No. 11,428/2006) could be further developed to fill identified gaps at the international level. Generally, however, the Law is tailored to a specific forest.

1.3.3.6 State of São Paulo: Decree No. 59,263 on Contaminated Areas

The State of São Paulo was the first state in Brazil to provide for treatment of contaminated areas.[297] The State Minas Gerais, for example, now has a similar law (Deliberative Resolution No. 116/2008) to protect soil quality and provide for management of contaminated areas.

The State of São Paulo Decree No. 59,263 of 2013[298] regulating State Law No. 13,577/2009 establishes guidelines and procedures for the protection of soil quality and the management of contaminated areas in the State of São Paulo.

Its objective is to ensure the sustainable use of soil, to protect it from contamination and prevent changes to its features and functions (cp. Article 2 of Decree No. 59,263). To meet this objective it notes that measures to protect the quality of soil and groundwater shall be promoted and that the contamination of areas shall be prevented. Further measures shall, for example, establish procedures to identify contaminated areas, ensure the health and safety of people exposed to contamination, promote the remediation of contaminated sites and groundwater affected by the contamination, encourage the reuse of remediated areas, promote articulation between institutions (cp. Article 2 I - VII of Decree No. 59,263). Article 3 of Decree No. 59,263 provides all relevant definitions, including definitions of contaminated areas and critically contaminated areas.

According to Article 3 II of Decree No. 59,263 contaminated area means an area that contains quantities or concentrations of matter, which cause or may cause harm to human health, the environment or property. According to Article 3 III of Decree No. 59,263, critically contaminated areas are areas that are contaminated due to damage or hazards, generate imminent risk to life or human health,

297 Sant'Anna, Luiz Fernando Henry, Julia Rabinovici and Marise Hosomi Spitzeck, Environment Brazil, Legal and regulatory framework, http://latinlawyer.com/reference/article/40585/brazil/.

298 Decreto No. 59.263, de 5 de Junho de 2013, http://governo-sp.jusbrasil.com.br/legislacao/1035183/decreto-59263-13.

unrest in the population or conflicts between the involved stakeholders, and that require immediate intervention. In addition, Article 3 of Decree No. 59,263 defines, for example, contaminated areas under investigation, contaminated areas undergoing a remediation process or a reuse process.

Article 11 of Decree No. 59,263 determines that any person or entity who, by act or omission, contaminates soil shall take the necessary steps to remediate the adverse and harmful changes to the soil functions measures.

The Decree establishes the requirement of a list containing all areas classified as contaminated (cp. Article 5f of Decree No. 59,263). These areas shall be published in Brazil's Official Gazette on an annual basis and be made available on the official website of the São Paulo Environmental Agency (Companhia Ambiental do Estado de de São Paulo, CETESB).[299] The Environmental Agency CETESB has published a technical manual for the investigation and cleanup of contaminated areas.[300] In general, the Decree aims to facilitate environmental management by serving as a public database for important environmental matters within the State of São Paulo.[301]

The Decree further establishes environmental insurance as a mandatory instrument that is intended to help businesses protect soil quality and manage contaminated areas. This approach, however, currently still needs to be implemented in practice. Thus far, no insurer has entered this market for such purposes. The relevant provision of the Decree will not become mandatory before such insurances are available.[302]

Decree No. 59,263/13 also requires that the Environmental Agency CETESB shall report to the State of São Paulo's Public Prosecutor all environmental irregularities it becomes aware of. The reported incidents will be investigated in view of criminal or civil liability.[303]

Conceptual approach: Decree No. 59,263 regulates several soil-related details with a focus on the prevention and remediation of soil contamination. The overall purpose is mainly to prevent harmful impacts on human health, the environment in general, and property. It establishes procedures for the identification of contaminated land.

Suitability: The procedures for the identification of contaminated land could be upscaled to the international level. Generally, however, its approach is not particularly distinct. Nonetheless, for the soil threat contamination it could provide useful monitoring incentives and guidance on transparency in contamination-related aspects of land degradation. As far as liability for soil contamination is concerned, it provides a standard approach.

1.3.3.7 Other laws directly or indirectly addressing or relevant in the context of land degradation

1.3.3.7.1. Law No. 9,985/2000: Brazilian Nature Conservation System

Law No. 9,985/00[304] establishes the Brazilian Nature Conservation System (Sistema Nacional de Unidades de Conservação da Natureza e dá outras providências; SNUC Act). It regulates the creation,

299 CETESB, www.cetesb.sp.gov.br.

300 Miguel, Carlos de (contributing author), Getting the deal through, Environment in 21 jurisdictions worldwide, 2014.

301 Gonçalves, Eduardo Damião and Lina Pimentel Garcia, Brazil: State of São Paulo Decree No. 59.263 - Contaminated Areas, 2013, http://www.mondaq.com/x/248116/Environmental+Law/State+of+So+Paulo+Decree+No+59263.

302 Gonçalves, Eduardo Damião and Lina Pimentel Garcia, Brazil: State of São Paulo Decree No. 59.263 - Contaminated Areas, 2013, http://www.mondaq.com/x/248116/Environmental+Law/State+of+So+Paulo+Decree+No+59263.

303 Gonçalves, Eduardo Damião and Lina Pimentel Garcia, Brazil: State of São Paulo Decree No. 59.263 - Contaminated Areas, 2013, http://www.mondaq.com/x/248116/Environmental+Law/State+of+So+Paulo+Decree+No+59263.

304 Lei No. 9,985, de 18 de Julho de 2000, http://www.mma.gov.br/port/conama/legiabre.cfm?codlegi=322.

management and use of conservation areas. These are classified either as Full Protection Units or Sustainable Use Units. The allowed uses and activities depend on the basis of this classification. Amongst the objectives of the law is the protection and restoration of water and edaphic (soil) resources and the recovery and restoration of degraded ecosystems (cp. Article 4 VIII and IX of Law No. 9,985/00).[305]

Conservation units are defined as territorial spaces including their environmental resources and jurisdictional waters, with significant natural features, that were legally instituted by the Government to meet conservation objectives and to which appropriate protection guarantees apply (cp. Article 2 I of Law No. 9,985/00). Nature conservation is defined as the management of the human use of nature, including the preservation, maintenance, sustainable utilisation, restoration and recovery of the natural environment to produce the greatest benefit, on a sustainable basis, for the present generations while maintaining its potential to meet the needs and aspirations of future generations and ensuring the survival of living beings in general (cp. Article 2 II of Law No. 9,985/00). Furthermore it determines that the soil and subsoil are amongst the addressed environmental resources (cp. Article 2 IV of Law No. 9,985/00). It provides detailed definitions also of important measures such as preservation, management, sustainable use, recovery or restoration (cp. Article 2 V-XIV of Law No. 9,985/00). Preservation is defined as covering a set of methods, procedures and policies aimed at the long-term protection of species, habitats and ecosystems, and the maintenance of ecological processes. Recovery is defined as a process aiming to turn a degraded ecosystem into a system that is a non-degraded condition, which may, however, differ from the original condition. Restoration, in contrast, is defined as a process of aligning a degraded ecosystem as closely as possible with its original condition.

Conceptual approach: Law No. 9,985/00 regulates the establishment of conservation areas for environmental protection purposes. These are subject to special protection measures.

Suitability: The law is presumably too general in its protective scope to be suitable for upscaling purposes at the international level. The list of objectives of the establishment of conservation areas includes the protection and restoration of soil resources. However, it is only one of many objectives, such as contributing to the maintenance of biological diversity and genetic resources, protecting endangered species, preserving and restoring the diversity of natural ecosystems, promoting sustainable development, protecting natural landscapes and landscapes of remarkably scenic beauty etc.

1.3.3.7.2. Law No. 9,433/1997: Water

The most important law on water is Law 9,433/97[306]. It establishes the National Policy on Water Resources (Política Nacional de Recursos Hídricos). This policy determines that the use of water resources aims to ensure the quantitative and qualitative control of water use and it regulates the exercise of rights concerning access to water.[307]

Article 12 of Law 9,433/97 determines that certain activities relating to the use of water require a specific permit. Of importance in terms of impact on groundwater and soil, a regulated activity is the release of water sewage and other liquid or gaseous waste in the watercourse. Generally, Law 9,433/97 determines that the joint management of water resources and land use belong to the general guidelines for the implementation of the National Policy on Water Resources (cp. Article 3 V of

305 Cp. for details also Leibniz Institute of Ecological and Regional Development (IÖR), International Approaches to compensation for Impacts on Biological Diversity, Final Report 2009.

306 Lei No. 9,433, de 8 de Janeiro de 1997, http://www.mma.gov.br/port/conama/legiabre.cfm?codlegi=370.

307 Doria, Maria Alice, Brazil, Doria, Jacobina e Gondinho Advogados, http://latinlawyer.com/reference/topics/51/jurisdictions/6/brazil/.

Law 9,433/97). Article 31 of Law 9,433/97 further notes that the implementation of the National Policy on Water Resources shall promote the integration of, inter alia, soil conservation in the federal and state water resource policies.

Articles 6 and 7 of Law 9,433/97 determine that Water Resources Plans shall be set up as long-term plans. The public, state and municipal governments and civil society participate in the development of the plans. They constitute management instruments that "set out priorities, actions, programmes and projects and aim to harmonise the uses of water with the preservation of water resources.[308] In addition to including at least a diagnosis of the current situation of water resources, the plans shall also include an analysis of changes in patterns of land use (cp. Article 7 II of Law 9,433/97).

Article 49 I of Law No. 9,433/1997 regulates prohibited activities. These include, for example, the drilling of wells to extract groundwater or operating them without proper authorisation or extracting or using water for any purpose without the proper grant of use rights.

The law also regulates the liability for any environmental damage caused by the polluter's activity. This includes the obligation to clean up or pay compensation for the water pollution. In addition, fines are imposed for carrying out water-related activities without the necessary license.[309]

Conceptual approach: The law's conceptual approach is to require permits for potentially harmful water-related activities and to prohibit certain activities altogether. Further, it establishes the need for long-term water resources plans and regulates liability for caused environmental damage.

Suitability: While the law has an impact on soil quality, its strong focus on specifically water-related issues implies that its suitability for upscaling purposes is limited.

1.3.3.7.3. Law No. 12,305/2010: Waste

Also the degrading and contaminating effects of waste are regulated. The management of solid waste is regulated by the Brazilian Solid Waste Management Policy (Política Nacional de Resíduos Sólidos), which was established by Law No. 12,305/2010 and Decree No. 7,404/2010. Given that the availability of landfills is one of Brazil's major environmental concerns as sufficient authorised landfills for the adequate treatment and disposal of waste are not available, Law 12,305/2010 established deadlines for states and municipalities to prepare solid waste plans. Upon this condition, federal financial resources for implementing landfills are made available.[310] In addition, there are numerous specific laws with details on specific types of waste (e.g. radioactive waste: Law No. 10,308/2001; hazardous civil construction waste: CONAMA Resolution No. 307/2002; hazardous waste in general: CONAMA Resolution No. 452/2012; pesticides: CONAMA Resolution No. 334/2003). [311]

Under this system, any person or company directly or indirectly causing environmental degradation is held to be the "polluter". The generator of waste is responsible for environmental damage caused as a result of the management of this waste, even if the temporary storage, transportation or final disposal is carried out by third parties. For waste disposal, the waste generators are obliged to rely on

308 Practical Law, Environmental law and practice in Brazil: overview, http://us.practicallaw.com/2-508-8459.

309 Practical Law, Environmental law and practice in Brazil: overview, http://us.practicallaw.com/2-508-8459.

310 Doria, Maria Alice, Brazil, Doria, Jacobina e Gondinho Advogados, http://latinlawyer.com/reference/topics/51/jurisdictions/6/brazil/.

311 Miguel, Carlos de (contributing author), Getting the deal through, Environment in 21 jurisdictions worldwide, 2014.

entities that hold the necessary environmental licences. In case of non-compliance, fines can be imposed on the respective company.[312]

Conceptual approach: Law No. 12,305/2010 adopts a comprehensive approach to the regulation of waste and its degrading and contaminating effects. In that vein, it also deals with liability issues.

Suitability: Like Law 9,433/97, Law No. 12,305/2010 is of limited suitability, given that is has a limited scope that is of relevance for land degradation.

1.3.3.7.4. Law No. 8,171/1991: Agricultural Policy

Law No. 8,171/91[313] (Agricultural Policy) determines that the government shall promote or encourage the recovery of areas affected by desertification (cp. Article 19 IV of Law No. 8,171/91).[314] Pursuant to Article 21a of Law No. 8,171/91, the Government shall also identify, throughout the national territory, areas affected by desertification; appropriate management plan for the use of technologies that can stop the process of desertification shall be adopted. To that end, the Government shall create registers for areas subject to desertification processes at the state and municipal level (cp. Article 21a of Law No. 8,171/91). There are requirements for agricultural planning, including that it shall be carried out in accordance with the provisions of Article 174 of the Federal Constitution[315] and in a democratic and participatory way (cp. Article 8 of Law No. 8,171/91). The environmental resources soil, water, fauna and flora shall be used rationally (cp. Article 19 II of Law No. 8,171/91). The use of natural fertilisers shall be encouraged (cp. Article 19 VII of Law No. 8,171/91).

Conceptual approach: Law No. 8,171/91 provides a detailed approach for an agricultural policy, covering agricultural activities, agro-industrial, fishing and forestry activities.

Suitability: In the context of planning, Law No. 8,171/91 includes elements that could be used to combat land degradation at the international level. This concerns the approach taken to the creation of registers for areas affected by desertification but also the technology requirements established.

312 Practical Law, Environmental law and practice in Brazil: overview, http://us.practicallaw.com/2-508-8459.

313 Lei No. 8,171, de 17 de Janeiro de 1991, http://www.planalto.gov.br/ccivil_03/leis/l8171.htm.

314 Avanzi, Junior Cesar, Luís Antônio Coimbra Borges, Ricardo Carvalho, Proteçao Legal do Solo e dos Recursos Hidricos no Brasil, 2009.

315 Article 174 CF: "As the normative and regulating agent of the economic activity, the State shall, in the manner set forth by law, perform the functions of control, incentive and planning, the latter being binding for the public sector and indicative for the private sector. Paragraph 1. The law shall establish the guidelines and bases for planning of the balanced national development, which shall embody and make compatible the national and regional development plans. Paragraph 2. The law shall support and encourage cooperative activity and other forms of association. Paragraph 3. The State shall favour the organization of the placer-mining activity in cooperatives, taking into account the protection of the environment and the social economic furthering of the placer-miners. Paragraph 4. The cooperatives referred to in the preceding paragraph shall have priority in obtaining authorization or grant for prospecting and mining of placer resources and deposits in the areas where they are operating and in those established in accordance with article 21, XXV, as set forth by law."

2 PART 2: ANALYSIS OF INTERNATIONAL CONTEXT

The following analysis will centre upon the possibility of integrating the LDNW target into international law through particular measures and instruments aimed at prevention and remediation/offsetting and/or planning against land degradation. The first section of this analysis provides a review of the UNFCCC and its Kyoto Protocol, the CBD and its two protocols, and the UNCCD with regards to the existing measures and provisions contained within the agreements that address prevention, remediation/offsetting, and planning as well as gaps which exist under these three categories in the respective agreements. The second section aims to identify the legal ability and procedure to integrate LDNW provisions into the international agreements by assessing the provisions that address amendments and adoption of protocols existing within the conventions. Finally, the third section aims to provide an assessment about the suitability of any national laws analysed in Part 1 of the report for the three case study countries to be upscaled and incorporated into international law. The section will further include an assessment of the most relevant instruments contained in the national systems which could provide examples to be incorporated into international law, e.g., a permitting system which requires wetland mitigation banking contained in one of the national laws of the United States.

2.1 Gaps in existing international agreements with regards to LDNW

This section is aimed at identifying existing provisions in the analysed international agreements which directly or indirectly prevent, remediate/offset and/or plan against land degradation. By taking stock of what already exists at the international scale, it helps demonstrate where there are gaps in provisions under these three categories. Once the gaps have been pointed out, the next step would be to identify whether there are available provisions from the three national legislative frameworks analysed which could fill those gaps. If none exist which could be directly inserted, certain elements or instruments might provide specific examples that could be tailored to the international context and inserted into the agreement. This potential upscaling to the international level was the reason the national law examples were identified and detailed in Part 1 of the report.

The agreements analysed below all have particular objectives and different focuses that influence the scope and aim of the various provisions contained within the agreement. For instance, the UNFCCC is aimed at climate change mitigation and adaptation. Thus, the provisions contained within the agreement might very well address prevention of land degradation, but it would be through the lens of preventing degradation since land is a sink for climate change-causing greenhouse gas emissions. The same applies to the CBD. It is aimed at preserving biological diversity, so provisions aimed at preventing degradation of land are specifically concerned with the biodiversity contained on the land. The UNCCD is aimed at preventing further degradation of land from the perspective of combating desertification. These emphases could potentially influence the way in which the LDNW target is incorporated into the respective agreements, e.g., instruments tailored or existing provisions amended to include land degradation neutrality in addition to another focus.

2.1.1 United Nations Framework Convention on Climate Change

The United Nations Framework Convention on Climate Change (UNFCCC) is a global agreement ratified by 195 Parties aimed at "prevent[ing] dangerous anthropogenic interference with the climate system".[316] In accomplishing this objective, the Convention states that it "should be achieved within a time-frame sufficient to allow *ecosystems to adapt naturally to climate change*, to ensure that *food*

316 United Nations Framework Convention on Climate Change (UNFCCC), 9 May 1992, 1771 U.N.T.S. 107 (entered into force 24 March 1994), Article 2.

production is not threatened and to enable *economic development to proceed in a sustainable manner*".[317] The Convention thus establishes a system whereby countries monitor their emissions and report to the Secretariat regarding annual emissions, removals, policies and measures taken to address climate change. There are different responsibilities for different Parties depending on whether they appear in Annex I of the UNFCCC.[318] Annex I countries are developed countries which have more historical responsibility in terms of emissions contributing to climate change, so they must take more steps to reduce their emissions than non-Annex I countries and provide funding to developing countries to complete their less frequent reporting on climate change measures (e.g., adaptation).

The UNFCCC has one protocol, the Kyoto Protocol, which was adopted, ratified by 192 Parties (though Canada has since withdrawn from the Convention), and entered into force on 16 February 2005.[319] This legally binding agreement establishes specific target emission reduction levels for the Annex I countries of the UNFCCC and provides different mechanisms by which these levels can be reached: Joint Implementation (Article 6)[320], the Clean Development Mechanism (Article 12)[321], and an Emissions Trading Scheme (Article 17)[322]. In addition to the legal framework of the UNFCCC, there are myriad decisions which have been adopted by the Conference of the Parties for implementation as well as reports issued from the supporting scientific and technical bodies.

2.1.1.1 UNFCCC

The UNFCCC provisions which would contribute to preventing or remediating land degradation are framed within the context of climate change mitigation and adaptation for sinks and reservoirs of greenhouse gases. Planning is also mentioned. However, many of the provisions present a general target or objective (e.g., that Parties' should take action to mitigate the effects of climate change) but the way in which the Parties should implement this is determined by the country. Therefore, national examples of legislation which fit within the context of the Convention could also contribute to the LDNW target. For example, many landscape mitigation and adaptation actions which may be incentivised within a legal framework can have positive impacts on or help avoid land degradation.[323]

317 Ibid. (emphasis added).

318 Ibid. at Article 4(2).

319 Kyoto Protocol to the UNFCCC, 10 December 1997, U.N. Doc FCCC/CP/1997/7/Add.1, 37 I.L.M. 22 (entered into force 16 February 2005).

320 The Joint Implementation mechanism allows Annex I countries to receive emissions reduction units (ERUs) from another Annex I country in exchange for a project which creates emissions reductions that would not have otherwise occurred, e.g., Germany creates a renewable energy project in an Eastern European country with an economy in transition and receives ERUs it can use toward its national target.

321 The Clean Development Mechanism allows Annex I countries to receive certified emission reductions (CERs) for developing a project in a non-Annex I country which results in emissions reductions which would not have otherwise occurred, e.g., Germany creates a renewable energy project in Kenya and receives CERs it can use toward its national target.

322 An Emissions Trading Scheme establishes a capped level of emissions and allocates a certain amount of allowed emission units to each regulated entity within the system, e.g., a power plant. If the entity will exceed its allocated amount of emissions, it must either install modifications to its own operation which reduce its emissions or buy leftover emission units from another entity which will be under its allocated amount of emissions.

323 E.g., conservation tillage can provide adaptation benefits by increasing soil moisture retention as well as prevent land degradation by reducing erosion potential and losses of soil organic matter. Holland, J.M. (2004) The environmental consequences of adopting conservation tillage in Europe: reviewing the evidence, Agriculture, Ecosystems & Environment 103: 1-25. Science Communication Unit, University of the West of England, Bristol (2013). Science for Environment Policy In-depth Report: Sustainable food. Report produced for the European Commission DG Environment, November 2013. Available at: http://ec.europa.eu/science-environment-policy.

Under Article 3, section 3 requires that precautionary measures be taken to "anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects" on all relevant sinks and reservoirs, which include land, soil and forests. This would be applicable to prevention of land degradation from the threats soil erosion and salinisation (for coastal lands) caused by climate change events, but not more generally. However, section 3 also states that policies and measures should be cost-effective and section 4 provides for Parties to develop policies and measures that are contextually appropriate given their need for sustainable development. Thus, economic development could be prioritised over prevention of land degradation within countries' policies and measures and land degradation could occur. This could potentially include actions which lead to soil contamination and/or sealing from increased industrialisation.

Article 4, section 1(d) requires all Parties to promote sustainable management of sinks and reservoirs, which would again encompass prevention of land degradation, but remediation is also included since promotion and cooperation in the conservation and *enhancement* of sinks and reservoirs is required. This would likely include the soil threats of erosion and salinisation, the latter additionally including appropriate irrigation management to avoid soil salinisation since that would fall within sustainable management. Section 1(e) requires Parties to develop plans for the "protection and rehabilitation of areas, particularly in Africa, affected by drought and desertification, as well as floods", which actually encompasses both prevention and remediation of degraded lands. Section 1(f) finally requires Parties to take climate change into account in their social, economic, and environmental policies and actions through mechanisms such as environmental impact assessments (EIAs) in order to minimise adverse impacts on the environment (as well as the economy and public health). EIAs are key preventative mechanisms that provide a procedural check before government projects and measures are implemented. The EIAs proposed under this provision, however, are focused on climate change rather than broader land degradation.

Article 4, section 2(a) requires developed countries in Annex I to adopt national policies and take measures to mitigate climate change by protecting and enhancing their sinks and reservoirs. This includes both prevention and remediation of land degradation in relation to climate change, again confined to the soil threats of soil erosion and salinisation. Article 4, section 5 is a provision requiring developed countries and Annex II countries to promote, facilitate, and fund environmentally sound "know-how" transfer to other countries for implementation of the Convention. This provision supports sharing of best practice examples of legislative design for prevention, remediation, and planning. Particularly, section 8 of Article 4 also indicates that Parties must take developing countries' needs arising from adverse climate effects into consideration when implementing the Convention, including various categories of countries which are relevant to the soil threats discussed here: those prone to natural disasters, mountainous areas and liable to drought and desertification (erosion); high urban atmospheric pollution (contamination); and low-lying coastal areas (salinisation).

Finally, the funding mechanism under the Convention in Article 11, section 3 describes that there will be eligibility criteria and Parties will be evaluated as to whether their policies and measures match the aim of the Convention. This could be made to explicitly include land degradation prevention, remediation, and planning provisions within the national legislation in order to qualify for funding from the UNFCCC financial mechanism.

Summary

- The UNFCCC has many provisions which contribute to prevention of land degradation in the context of mitigating and adapting to climate change.

The UNFCCC includes provisions which prevent land degradation by requiring the Parties to adopt precautionary measures against the causes of climate change (e.g., unsustainable land management

contributing major emissions such as deforestation or wetland destruction) as well as mitigate the effects of climate change on all relevant sinks and reservoirs (i.e., grasslands, wetlands, etc.). Additionally, the requirement to promote sustainable management of sinks and reservoirs and the need to conduct EIAs regarding the impact of climate change within social, economic and environmental policies are ways in which the UNFCCC contributes to prevention of land degradation.

- Remediation of land degradation is less emphasised than prevention in the scope of measures Parties must implement to mitigate and adapt to climate change under the UNFCCC.

Remediation under the UNFCCC is mentioned in the requirement to not only conserve but *enhance* sinks and reservoirs. Parties could thus promote the remediation of degraded lands as a way to enhance carbon sequestration since the aim of enhancing the sink is to mitigate climate change.

- Planning to prevent and remediate land degradation is explicitly incorporated into the UNFCCC, which would contribute toward achieving zero net land degradation even though it is not the focus.

Parties are required to make plans as to how they will protect and rehabilitate areas (i.e., prevent degradation of and remediate degradation on specific lands). The relevant example in the Convention is areas affected by drought, desertification and floods. Additionally, the national policies and measures which must be adopted by Parties to mitigate climate change by protecting and enhancing sinks and reservoirs are also planning instruments which might be applied i.a. to determine how the zero net balance of land degradation will be achieved.

2.1.1.2 Kyoto Protocol

Similar to its parent convention, the Kyoto Protocol focuses on climate change when outlining provisions regarding sinks and reservoirs that are relevant to land degradation. Article 2 describes the Annex I Parties' mandate to adopt national policies and measures for protection and enhancement of sinks and reservoirs, promotion of sustainable forest management practices, and "promotion of sustainable forms of agriculture in light of climate change considerations". This would contribute to prevention and remediation of land degradation in terms of soil erosion and potentially salinisation.

Article 6 on the Joint Implementation mechanism could include projects that enhance removals by sinks, which could encompass projects which remediate degraded land. Additionally, the projects could reduce emissions from sources, so those could include prevention of land degradation since land can function as a source of emissions as well. However, national legislation is less relevant here due to the project basis (unless there was some type of requirement that government funding for these projects must be put toward projects which contribute to land degradation neutrality).

Under Article 10, the Parties are required to formulate, implement, publish and regularly updated programmes that aim to mitigate and facilitate adaptation to climate change, and agriculture, forestry and waste management are particularly mentioned. This would involve land degradation prevention and potentially planning to address the threats of soil erosion, salinisation, and contamination.

Article 12 on the Clean Development Mechanism does not include a reference to the type of projects which can or should be supported as under Article 6 (enhancing removals by sinks and reducing emissions from sources). This gap in promotion of land degradation prevention and remediation within the context of developed country support for projects in developing countries is important due to a potential lack of incentive to create land degradation-focused projects.

The Article 17 authorisation of emissions trading does not detail the types of emissions reductions which are eligible, so this gap could include land degradation remediation or prevention actions which also have a climate change benefit.

Summary

- The Kyoto Protocol also mandates that Parties adopt national policies and measures to prevent and remediate land degradation in the context of climate change mitigation and adaptation.

The Kyoto Protocol gets a bit more specific than the UNFCCC in terms of defining which types of national policies and measures should be adopted to promote the protection and enhancement of sinks and reservoirs. For example, promotion of sustainable forest management practices, and "promotion of sustainable forms of agriculture in light of climate change considerations" are too examples included in the text of the Kyoto Protocol for parties to adopt.

- The Kyoto Protocol includes planning provisions which help avoid land degradation but are directly focused on mitigating and facilitating adaptation to climate change.

Parties to the Kyoto Protocol must also adopt programmes that aim to mitigate and facilitate adaptation to climate change, specifically within the areas of agriculture, forestry and waste management, for instance. These types of planning instruments could be tailored to meet the objective of zero balance, but as of now, they generally aim to prevent degradation of sinks and reservoirs from a climate change perspective.

- The Kyoto Protocol includes provisions allowing for project-based actions and emissions trading which present possible entry points for land degradation prevention and remediation.

The provisions in the Kyoto Protocol which either allow for project-based actions (joint implementation and the CDM) or emissions trading vary in terms of whether the eligible actions include land degradation-relevant actions or whether the eligible actions are defined in the legally binding document at all. Rather, the Conference of the Parties (COP) decisions would typically define how the provisions in the protocol should be implemented by the Contracting Parties. One gap in particular is under the CDM, which details the ability of Annex I Parties to partially fulfil their emissions reduction commitments through developing projects in non-Annex I countries, but it does not outline the types of projects which may be included. This could specifically include or promote land degradation prevention and remediation actions as eligible to receive credits for the investing Annex I country.

2.1.2 Convention on Biological Diversity

The Convention on Biological Diversity (CBD) has 194 ratifying Parties and entered into force on 29 December 1993.[324] It has three main objectives: to conserve biological diversity, to achieve the sustainable use of biological diversity components, and to fairly and equitably share the benefits from using genetic resources.[325] The Parties create strategies, plans or programmes which are aimed at conserving and sustainably using biological diversity within their national jurisdiction as well as in actions abroad and monitor whether there is an urgent need for conservation or the biological diversity component is suitable for sustainable use.[326]

The CBD has two protocols: the Cartegena Protocol on Biosafety and the Nagoya Protocol on Access and Benefit-sharing. The Cartegena Protocol addresses the issue of living modified organisms and aims to ensure they are safely handled, transported and used between Contracting Parties in order to avoid adverse impacts on biological diversity. It entered into force on 11 September 2003 and estab-

324 Convention on Biological Diversity (CBD), 5 June 1992, 1760 U.N.T.S. 79 (entered into force on 29 December 1993).
325 Ibid. at Article 1.
326 Ibid. at Articles 6-7.

lishes information channels through which Parties can access information prior to allowing the biotechnology into the country. The Nagoya Protocol aims to ensure that the benefits which arise from different genetic resources are shared fairly and equitably between different users, which includes appropriate access and technology transfer and funding. It was adopted on 29 October 2010 and just recently received sufficient ratifications (50 Parties) to enter into force.

Neither of these protocols is directly relevant to the LDNW issue under analysis in this report, and even the associated effects to land which arise from implementation of their provisions are quite indirectly related, e.g., land degradation prevented through better coordinated notification of transfers of biotechnological living modified organisms. Additionally, the effect on land degradation resulting from implementation of the protocol's provisions may be quite speculative though perhaps an intended indirect consequence of adoption of the measure, e.g., valuing local communities' traditional knowledge on genetic resources may lead to better sharing of the benefits and compensation to the community which may put less pressure on the inhabitants to expand their agricultural subsistence production and may result in less agricultural expansion into forests. Thus, these protocols will not be analysed further within this report.

The CBD contains provisions mostly targeted at conservation and sustainable use to prevent degradation, but the focus is on preventing degradation of biological diversity more broadly than just on land. However, there are a few places where remediation is incorporated, and one land use planning measure in the form of establishment of protected areas. The CBD provisions allow the Parties flexibility in implementing the different requirements to adopt plans and programmes, so there is scope for example national legislation to help increase adoption of laws which prevent degradation by other Parties, but they must be within the context of preserving biodiversity to fit under the Convention.

Article 6 requires the Parties to develop or adapt national strategies, plans and programmes in order to target conservation and sustainable use of biological diversity, as well as integrate these objectives into other sectoral policies and programmes. These provisions focus on prevention against degradation, but with regards to biodiversity rather than land. Though actions on land affect the biodiversity existing on land, so these plans and programmes could indirectly prevent land degradation as well.

Article 7(c) aims to identify and monitor different processes and activities which have or are likely to have significant adverse impacts on biodiversity, which could include those that threaten soil contamination and soil sealing. Additionally, wetland destruction would impact biodiversity. Thus, this provision may contribute to prevention of land degradation through awareness of threats due to monitoring.

Article 8 discusses in-situ conservation or prevention of degradation of biodiversity through the Parties establishing protected areas, which would include land, soil and forest resources. This type of planning measure where certain areas are designated protected combats against the soil threats of sealing by preventing development and contamination by preventing industrial activity and waste disposal. Furthermore, section (e) requires Parties to promote sustainable development next to the protected areas in order to reduce harmful impacts on the neighbouring biodiversity, which also contributes to prevention against contamination and potentially sealing (e.g., migratory corridors destroyed by development). Erosion from use of the land resources may be reduced by classifying it as a protected area and restricting use, but natural erosion may still occur from weather events. Section (f) is the first to directly address remediation by requiring Parties, as appropriate and to the extent possible, to rehabilitate and restore degraded ecosystems, which includes land degradation remediation.

The sustainable use of biodiversity under the CBD is presented in Article 10, which requires Parties, as far as possible and as appropriate, to adopt measures about the use of biodiversity which prevent or minimise adverse impacts on it. This could contribute to sustainable use of land as a biodiversity resource and combat soil erosion from unsustainable land management practices and salinisation

from unsustainable irrigation practices. Section (d) also references remedial actions in areas where the biodiversity has been degraded, which could include soil and land resources.

Article 14 introduces the requirement for Parties to, as far as possible and as appropriate, conduct EIAs for proposed projects that are "likely to have significant adverse effects on biological diversity with a view to avoiding or minimizing such effects". They shall also duly consider the environmental consequences of other programmes and policies that are likely to significantly negatively impact biodiversity. This preventative mechanism should exist then in Parties' national legislation, but if not, examples of national legislation from the case studies can be used to fulfil this obligation.

Summary

- The CBD includes planning provisions in the form of national action plans and strategies that would contribute to land degradation neutrality.

The national action plans and strategies which are required by Parties to the CBD would be focused on conservation and the sustainable use of biodiversity, thereby indirectly preventing land degradation. A particularly specific form of planning that would contribute toward the LDNW target is required under the CBD – to define protected areas (or areas where degradation is prevented) from a biodiversity standpoint.

- The CBD contains prevention measures against biodiversity degradation and for sustainable use of biological resources, which would contribute to preventing land degradation.

Measures must be adopted by the Parties to promote sustainable use of biological resources and to prevent biodiversity degradation. These measures must specifically identify and monitor the drivers of degradation (actions, processes) and aim to combat the negative effects, which could help to prevent land degradation in addition to biodiversity degradation in general.

- The CBD also includes a few remediation provisions.

The CBD contains the requirement for Parties to rehabilitate and restore degraded ecosystems, but this is again from the perspective of remediation in areas where biodiversity has been degraded. These areas would include but are not confined to land-based ecosystems, so this measure could contribute to land degradation remediation to a certain extent.

2.1.3 United Nations Convention to Combat Desertification

The United Nations Convention to Combat Desertification (UNCCD) has been ratified by 195 Parties and entered into force on 26 December 1996. It aims to combat land degradation and desertification by focusing on sustainable land management within "affected country Parties". Those countries in arid, semi-arid and dry sub-humid areas (collectively known as drylands) are definitely included under the scope of the Convention, and debates between the Parties are currently underway to determine the wider applicability of the Convention to all lands which face the risk of or suffer from land degradation.[327] The Convention also includes provisions for financing support from developed countries which are not affected Parties.[328] The affected country Parties create National Action Programmes (NAPs) in order to identify drivers of desertification and develop measures to combat this

327 See Vardevanyan, A. (2014) Letter from the National Coordinator of the UNCCD in the Republic of Armenia to the Secretary-General of the UNCCD on behalf of the Parties of the Annex V of the UNCCD.

328 United Nations Convention to Combat Desertification (UNCCD), 17 June 1994, 1954 U.N.T.S. 3 (entered into force 26 December 1996), Article 2.

and mitigate desertification, as well as cooperate on scientific and technical matters under the Convention. The UNCCD has no protocols.

The UNCCD is the international agreement which most directly targets land degradation out of the three conventions analysed in this report. The framework is specifically aimed at preventing (further) land degradation in affected areas through planning of action programmes and/or long-term strategies. However, despite the fact that remediation is identified as an objective of the Convention, there are almost no provisions which incorporate a remediation element into the comprehensive preventative activities. Therefore, this is a large gap where national legislation could provide examples as to how remediation could be achieved within the context of the Convention, which would likely be relevant to the erosion, salinisation, and wetland destruction soil threats under this study.

The objectives laid out in Article 2 of the UNCCD specifically cover prevention and remediation of land degradation (and water resources), and even planning since it states that achieving the objective of combating desertification and mitigating the effects of droughts "will involve long-term integrated strategies".

Article 5, section (b) specifically requires affected country Parties to "establish strategies and priorities, within the framework of sustainable development plans and/or policies, to combat desertification and mitigate the effects of drought". Section (c) also requires the drivers of desertification to be identified and addressed, which would contribute to prevention of degradation from the soil threat of erosion under this study. Finally, national legislation examples are extremely relevant under section (e) as it calls for strengthening of existing and creation of new legislation to implement the Convention.

Article 10 describes the requirement that affected Parties must develop NAPs that incorporate long-term strategies, so a planning aspect. Section 2(c) aims to give particular attention to preventative measures so that land which is not degraded or slightly degraded can be preserved or enhanced. Section 3 sets forth the NAP measures for drought mitigation that can be included, such as strengthening drought preparedness and management. This preventative land degradation measure would combat against the soil erosion threat. Additionally, Section 3(e) points to sustainable irrigation programmes, which could help prevent salinisation of the soil.

The UNCCD provides more concrete provisions in terms of methods to directly address land degradation, such as Article 19 regarding capacity building, education and public awareness. These types of training and awareness raising activities presented (e.g., participatory approach, extension services and field agents, training and technology in renewable energy sources, etc.) can contribute to prevention of land degradation, but they can also support remediation actions if those are included. As the list appears under Article 19, most actions are aimed at prevention rather than remediation (e.g., "participatory approaches for the conservation and sustainable use of natural resources").

Article 20 focuses on the mobilisation of resources from developed countries to affected country Parties to support implementation of actions to combat desertification and mitigation drought, thereby supporting prevention of land degradation.

Summary

The National Action Programmes required under the UNCCD are planning instruments that target prevention of land degradation through long-term strategies. Remediation is to be included by the Parties, but the Convention does not specifically highlight examples of what types of remediation actions or measures are possible. Rather, it focuses in large part on prevention of further land degradation. Parties must identify the drivers of land degradation within their national context and strive to mitigate those drivers and the effects on land through the adoption of national legislation.

2.1.4 Summary

The international agreements discussed in this section contain different types of measures and varying levels of focus on the prevention, remediation, and planning against land degradation. Overall, there is an emphasis in all three conventions on the prevention of impacts on ecosystems, land, sinks and reservoirs (different terms are used in the conventions) within the focus of that particular convention – climate change, biodiversity degradation, or desertification/land degradation.

Environmental impact assessments, which operate as a procedural check on governmental action which could have significant environmental impacts, are mentioned under both the UNFCCC and CBD. The inclusion of this prevention mechanism would be relevant under the UNCCD as well so that Parties provide a procedural check to assess and prevent land degradation from being caused or furthered by government-sponsored policies, programmes, or projects, which Parties may choose to extend to private actions as well, before it occurs.

Each convention requires a large amount of planning through national strategies, plans, programmes, national measures, legislation, etc. to contribute to prevention of degradation of land, ecosystems, sinks and reservoirs. Nonetheless, land use planning or protection could be more effectively utilised, coordinated, and comprehensive to prevent and remediate/offset land degradation. Protected area designation is only included under the CBD, so this could be expanded to more broadly cover land degradation beyond simply the biodiversity focus.

Project-based mechanisms and emissions trading schemes include land degradation prevention and remediation actions only to a limited degree, so broadening the scope of actions accepted under the mechanisms would potentially increase the uptake and demand for this type of activity (e.g., more types of LULUCF projects accepted under the CDM than just afforestation and reforestation).

Finally, there are some specific instances where remediation is mentioned, but in general this is a weak point within the international agreements that were analysed. While preventative measures are important, there is also a need for remediation to counter-balance any degradation that happens regardless of the preventive actions.

2.2 Legal basis for amendments or adoption of a protocol

2.2.1 Amendment of international treaties

The inclusion of any kind of link to land degradation in an existing instrument of international law would be subject to standard amendment procedures. In general, the amendment of treaties follows the rules of the Vienna Convention on the Law of Treaties unless provided otherwise in the respective treaty.

2.2.1.1 Vienna Convention on the Law of Treaties (VCLT)

Unless the treaty in question provides otherwise, the amendment of multilateral treaties is determined by the rules stipulated in Article 40 VCLT ("Amendment of multilateral treaties" in "Part IV – Amendment and Modification of Treaties").

According to this Article, "[a]ny proposal to amend a multilateral treaty as between all the parties must be notified to all the contracting States, each one of which shall have the right to take part in: (a) the decision as to the action to be taken in regard to such proposal; (b) the negotiation and conclusion of any agreement for the amendment of the treaty."

In addition, Article 40 paras. 3 and 4 VCLT are of particular importance. Article 40 para. 3 VCLT holds that "[e]very State entitled to become a party to the treaty shall also be entitled to become a party to the treaty as amended." Article 40 para. 4 VCLT determines that "[t]he amending agreement

does not bind any State already a party to the treaty which does not become a party to the amending agreement; article 30, paragraph 4(b), applies in relation to such State.”

2.2.2 Amendment of the UNFCCC, UNCCD or CBD

Three international treaties are of particular interest and relevance when it comes to identifying an international instrument that is well-suited for the inclusion of rules on land degradation. These three treaties are the “United Nations Framework Convention on Climate Change” (UNFCCC), the “Convention on Biological Diversity” (CBD) and the “United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, particularly in Africa” (UNCCD). All instruments have similar rules regulating the amendment of the respective convention.

2.2.2.1 United Nations Framework Convention on Climate Change (UNFCCC)

The amendment of the UNFCCC is governed by Article 15 UNFCCC (“Amendments to the Convention”). Under this Article, any party to the UNFCCC has the right to propose amendments (“Any Party may propose amendments to the Convention”).

The adoption of amendments is, however, subject to specific formal requirements. First of all, the adoption requires the setting of an ordinary session of the Conference of the Parties (COP) according to Article 15 para. 2 UNFCCC (“Amendments to the Convention shall be adopted at an ordinary session of the Conference of the Parties.”). In addition, the text of the proposed amendment needs to be made available, inter alia, to the parties well in advance of this COP (“The text of any proposed amendment to the Convention shall be communicated to the Parties by the secretariat at least six months before the meeting at which it is proposed for adoption [...]”).

In addition, Article 15 UNFCCC provides detailed voting rules. Generally, an agreement on the proposed amendment requires consensus and the parties “shall make every effort to reach” such an agreement by consensus (cp. Article 15 para. 3 UNFCCC). Only “[i]f all efforts at consensus have been exhausted, and no agreement reached, the amendment shall *as a last resort* be adopted by a *three-fourths majority vote* of the Parties present and voting at the meeting [...].” (Article 15 para. 3 UNFCCC; emphasis added). Subsequently, the amendment requires the acceptance of the parties. For that purpose, the secretariat circulates the amendment to the Depositary, who then circulates it to all parties (cp. Article 15 para. 3 UNFCCC). The parties shall deposit their instruments of acceptance with the Depositary (Article 15 para. 4 UNFCCC).

It is also particularly important to note that the entry into force of the agreed amendment still depends on whether the specifically required number of parties deposits their instrument of acceptance. Provided this is the case, the amendment enters into force on the ninetieth day after the minimum number of acceptance instruments has been received (cp. Article 15 para. 4 UNFCCC: “[...] An amendment adopted in accordance [the mentioned requirements] shall enter into force for those Parties having accepted it on the ninetieth day after the date of receipt by the Depositary of an instrument of acceptance by at least three fourths of the Parties to the Convention.”

Article 15 paras. 5 and 6 UNFCCC provide details on the entry into force of the amendment for any other party and defines “Parties present and voting” (“Parties present and casting an affirmative or negative vote.”).

Article 16 UNFCCC (“Adoption and Amendment of Annexes to the Convention”) regulates the adoption and amendment of Annexes to the UNFCCC. These annexes are limited to “restricted to lists, forms and any other material of a descriptive nature that is of a scientific, technical, procedural or administrative character” (cp. Article 16 para. 1 UNFCCC) which limits the range of possible matters to be included in an annex significantly. In any event, the proposal and adoption of annexes is subject to the same rules as mentioned in the context of Article 15 UNFCCC (cp. Article 16 para. 2

UNFCCC: "Annexes to the Convention shall be proposed and adopted in accordance with the procedure set forth in Article 15, paragraphs 2, 3 and 4.").

Merely the entry into force of an annex is subject to other detailed provisions (cp. Article 16 para. 3 UNFCCC: "An annex that has been adopted in accordance with [Article 16 para. 2 UNFCCC] shall enter into force for all Parties to the Convention six months after the date of the communication by the Depositary to such Parties of the adoption of the annex, except for those Parties that have notified the Depositary, in writing, within that period of their non-acceptance of the annex. The annex shall enter into force for Parties which withdraw their notification of non-acceptance on the ninetieth day after the date on which withdrawal of such notification has been received by the Depositary.")

As far as options for the adoption of protocols is concerned, "[t]he requirements for the entry into force of any protocol shall be established by that instrument" (cp. Article 17 para. 3 UNFCCC).

2.2.2.2 Convention on Biological Diversity (CBD)

Article 29 CBD regulates both, the amendment of the Convention and the amendment of Protocols. According to Article 29 para. 1 CBD "[a]mendments to this Convention may be proposed by any Contracting Party. Amendments to any protocol may be proposed by any Party to that protocol."

Article 29 para. 2 CBD[329] is similar to Article 15 para. 2 UNFCCC and regulates the proposal and adoption of amendments to the CBD Convention or its protocols.

Also the following provisions in Article 29 paras. 3 – 5 CBD are similar to those in Article 15 paras. 3 – 5 UNFCCC. Like Article 15 para. 3 UNFCCC, Article 29 para. 3 CBD[330] provides detailed voting rules; as a last resort, a *two-thirds majority* vote is sufficient. Article 29 para. 4 CBD[331] provides rules for the entry into force of amendments. Article 29 para. 5 CBD defines "Parties present and voting" ("Parties present and casting an affirmative or negative vote.").

Article 30 CBD regulates the adoption and amendment of annexes. Pursuant to Article 30 para. 2 CBD, the following procedure generally applies:

a) Annexes to this Convention or to any protocol shall be proposed and adopted according to the procedure laid down in Article 29;
b) Any Party that is unable to approve an additional annex to [the CBD] or an annex to any protocol to which it is Party shall so notify the Depositary, in writing, within one year from the date of the communication of the adoption by the Depositary. The Depositary shall without delay notify all

329 Article 29 para. 2 CBD: "Amendments to this Convention shall be adopted at a meeting of the Conference of the Parties. Amendments to any protocol shall be adopted at a meeting of the Parties to the Protocol in question. The text of any proposed amendment to this Convention or to any protocol, except as may otherwise be provided in such protocol, shall be communicated to the Parties to the instrument in question by the secretariat at least six months before the meeting at which it is proposed for adoption. The secretariat shall also communicate proposed amendments to the signatories to this Convention for information."

330 Article 29 para. 3 CBD: "The Parties shall make every effort to reach agreement on any proposed amendment to this Convention or to any protocol by consensus. If all efforts at consensus have been exhausted, and no agreement reached, the amendment shall as a last resort be adopted by a two-third majority vote of the Parties to the instrument in question present and voting at the meeting, and shall be submitted by the Depositary to all Parties for ratification, acceptance or approval."

331 Article 29 para. 4 CBD: "Ratification, acceptance or approval of amendments shall be notified to the Depositary in writing. Amendments adopted in accordance with paragraph 3 above shall enter into force among Parties having accepted them on the ninetieth day after the deposit of instruments of ratification, acceptance or approval by at least two thirds of the Contracting Parties to this Convention or of the Parties to the protocol concerned, except as may otherwise be provided in such protocol. Thereafter the amendments shall enter into force for any other Party on the ninetieth day after that Party deposits its instrument of ratification, acceptance or approval of the amendments."

Parties of any such notification received. A Party may at any time withdraw a previous declaration of objection and the annexes shall thereupon enter into force for that Party subject to subparagraph (c) below;

c) On the expiry of one year from the date of the communication of the adoption by the Depositary, the annex shall enter into force for all Parties to [the CBD] or to any protocol concerned which have not submitted a notification in accordance with the provisions of subparagraph (b) above.

Article 30 paras. 3 and 4 CBD provide details on the adoption and entry into force of amendments to annexes to [the CBD] or to any protocol and the entry into force if an additional annex or an amendment to an annex is related to an amendment to the CBD or to any protocol.

2.2.2.3 United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, particularly in Africa (UNCCD)

Articles 30 (“Amendments to the Convention”) and 31 UNCCD (“Adoption and amendment of annexes”) deal with the amendment of the convention and the adoption and amendment of annexes similarly.

Thus, Article 30 UNCCD[332] regulates in detail, inter alia, the adoption of an amendment at an ordinary session of the Conference of the Parties, the voting requirements (i.e. consensus as a rule, and two-thirds majority as a last resort) and an amendment’s entry into force.

Adoption and amendment of annexes

Article 31 UNCCD on the adoption and amendment of annexes provides the necessary details, including specific details applicable to regional implementation annexes.

Regional implementation annexes are regulated in detail by Article 15 UNCCD. According to this Article, “[e]lements for incorporation in action programmes shall be selected and adapted to the socio-economic, geographical and climatic factors applicable to affected country Parties or regions, as well as to their level of development. Guidelines for the preparation of action programmes and their exact

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332 Article 30 Amendments to the Convention:

“1. Any Party may propose amendments to the Convention.

2. Amendments to the Convention shall be adopted at an ordinary session of the Conference of the Parties. The text of any proposed amendment shall be communicated to the Parties by the Permanent Secretariat at least six months before the meeting at which it is proposed for adoption. The Permanent Secretariat shall also communicate proposed amendments to the signatories to the Convention.

3. The Parties shall make every effort to reach agreement on any proposed amendment to the Convention by consensus. If all efforts at consensus have been exhausted and no agreement reached, the amendment shall, as a last resort, be adopted by a two-thirds majority vote of the Parties present and voting at the meeting. The adopted amendment shall be communicated by the Permanent Secretariat to the Depositary, who shall circulate it to all Parties for their ratification, acceptance, approval or accession.

4. Instruments of ratification, acceptance, approval or accession in respect of an amendment shall be deposited with the Depositary. An amendment adopted pursuant to paragraph 3 shall enter into force for those Parties having accepted it on the ninetieth day after the date of receipt by the Depositary of an instrument of ratification, acceptance, approval or accession by at least two thirds of the Parties to the Convention which were Parties at the time of the adoption of the amendment.

5. The amendment shall enter into force for any other Party on the ninetieth day after the date on which that Party deposits with the Depositary its instrument of ratification, acceptance or approval of, or accession to the said amendment.

6. For the purposes of this article and article 31, "Parties present and voting" means Parties present and casting an affirmative or negative vote.

focus and content for particular subregions and regions are set out in the regional implementation annexes."

The adoption and amendment of such annexes is, in principle, subject to the same procedure as stipulated in Article 30 UNCCD. An additional requirement pursuant to Article 31 para. 1 UNCCD is that in addition to the majority requirements of Article 30 UNCCD, the adoption of an additional regional implementation annex or the amendment to any regional implementation annex is subject to a two-thirds majority vote of the Parties of the region concerned present and voting.

Further rules contained in Article 31 UNCCD on the adoption and amendment of annexes are similar to those already explained. They deal with the entry into force of the adopted or amended annex.

Importantly, Article 31 UNCCD does not only provide for the adoption of regional implementation annexes but also refers to "[a]n annex, other than an addition regional implementation annex" in its paragraph 2. Accordingly, annexes to the UNCCD do not have o take the form of a regional implementation annex but can also be of a more general nature.[333] They would become an integral part of the Convention (cp. Article 29 UNCCD).

Adoption of a Protocol

The UNCCD does not contain specific rules on the adoption of a Protocol. However, this is not necessarily an argument against such an adoption. There is no rule that suggests that an enabling provision in the respective Convention on the adoption of Protocols is always required. So while the two abovementioned examples – the UNFCCC and the CDB – have such provisions (Article 17 UNFCCC and Article 29 CBD) and also accompanying Protocols, namely the Kyoto Protocol[334] and the Cartagena[335] and the Nagoya[336] Protocol, the UNCCD does not provide for such Protocols. Nonetheless, the parties to the UNCCD would be free to adopt such a Protocol as it is, essentially, an international legal instrument subject to the will of the states. It is not apparent why an amendment of the UNCCD would be necessary.[337]

In the past, there have been cases in which Protocols were adopted despite the fact that the respective Convention did not include rules on such an adoption. For example, there is a Protocol under the umbrella of the 1972 Convention on the Prevention of Marine Pollution by dumping of Wastes and Other Matter (London Convention). This Protocol, the 1996 Protocol to the Convention on the Prevention of Marine Pollution by dumping of Wastes and Other Matter (as amended in 2006), is "more restrictive" and aims to "further modernize the Convention and, eventually, replace it."[338] The 1998 Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (Aarhus Convention) merely states in its Article 10 para. 2 that "the Parties

333 Cp. also Legal Expert Group – Established by the First Global Soil Week. Discussion Paper on Options for a regulatory mechanism under the UNCCD for land degradation neutrality and the sustainable use, management and protection of soils and their functions, June 2013.

334 Kyoto Protocol to the United Nations Framework Convention on Climate Change.

335 Cartagena Protocol on Biosafety to the Convention on Biological Diversity.

336 Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity.

337 Cp., however, Institute for Advanced Sustainability Studies e.V., Minutes Workshop, Soil Protocol Workshop, June 2013: "The UNCCD was reviewed to define the most feasible option and it was agreed by the group that an Annex under UNCCD (according to Article 31 of the Convention) would be the most feasible and time-effective option as it wouldn't require an amendment to the Convention. A protocol under UNCCD, at this stage would appear to be less acceptable for UNCCD parties because such a protocol would probably require an amendment to the Convention first and involve extended negotiation." (emphasis added).

338 http://www.imo.org/OurWork/Environment/LCLP/Pages/default.aspx.

shall keep under continuous review the implementation of this Convention on the basis of regular reporting by the Parties, and, with this purpose in mind, shall [...] [p]repare, where appropriate, protocols to this Convention”. Further details are not provided. The 2003 Protocol on Pollutant Release and Transfer Registers is a Protocol under the umbrella of the Aarhus Convention.

2.2.3 Summary

These mechanisms could be integrated into a more comprehensive international instrument in order to implement the LDNW target. Of the international agreements analysed in this study, the UNCCD is thematically aligned with the achievement of LDN as it is already aimed at combating land degradation and offers multiple examples of provisions which target prevention, remediation/offsetting and planning against land degradation. Thus, integrating the LDNW target into the agreement would not require extensive amendments to the focus of the relevant provisions. The UNFCCC or CBD are both focused on other topics (respectively, climate change and biodiversity conservation). However, the UNCCD is limited in its coverage of land worldwide, applying to drylands in affected country Parties. If developed country Parties begin to take on increasingly similar obligations to the affected country Parties, the distinction between the two types of Parties becomes useless and misleading. Additionally, it could call into question the funding structure under the UNCCD whereby the affected country Parties’ fulfilment of obligations depends on financing from the developed country Parties. If the developed country Parties incur comprehensive and ambitious obligations of their own, the funding structure would become less justifiable. Yet proposals to revise the current structure would most likely pose a significant obstacle to implementation of the LDNW target through the UNCCD as affected country Parties would assumedly not be eager to lose their funding support. The agreement has also undergone modifications to try to strengthen its prevailingly weak instruments (e.g., 10-Year Strategy), and global rates of land degradation and desertification continue to rise, pointing to a lack of effectiveness of the Convention. This precedent demonstrates that it would likely be quite difficult to achieve adoption of any strong obligations under the UNCCD agreement, such as ambitious implementing mechanisms and obligations, let alone to achieve the LDNW target.

The CBD presents another option for integration of the LDNW target. In its focus on conserving and enhancing biological diversity, it encompasses the avoidance/prevention and remediation of land degradation, which affects biological diversity. Adoption of a protocol under the CBD is possible in accordance with the enabling clause and as demonstrated by the Convention’s adoption of two prior protocols. The CBD was also strengthened through modifications to its implementation (e.g., Aichi biodiversity targets), so it seems more likely that ambitious implementing mechanisms and obligations could be adopted under this agreement. However, global biodiversity is still being lost despite the implementation of this Convention, so this agreement faces a lack of effectiveness as well, which may make it difficult to achieve the LDNW target under the CBD. The general scope of the Convention applies to all country Parties rather than distinguishing between different categories of countries in terms of biodiversity levels, thereby widening the potential coverage if the LDNW target were adopted under the CBD.

2.3 National legislation potentially suitable for upscaling

As discussed before, there are several gaps within the international framework with regard to remediation, prevention or planning which could possibly be filled by national and EU law provisions or soft law measures. A range of environmental, agricultural, building, forestry, and land use planning legislative and judicial possibilities exist to reduce threats to and encourage sustainable use and protection of soils. However, the international framework for prevention of soil and land degradation could be strengthened, especially in the field of soil protection law.

None of the pieces of national legislation identified in Part 1 are suitable for direct incorporation into international law as a way to implement the LDNW target. However, multiple instruments and mechanisms were identified when analysing the conceptual approaches of the different laws which could potentially contribute to implementation of the LDNW target. The inclusion of any kind of new instrument or modification to an existing mechanism to increasingly address land degradation in an international agreement would be subject to standard amendment procedures as outlined in the chapter before. In the following section, some initial suggestions for conducting such an upscaling of national legislation to the international scale are presented.

2.3.1 EU /Germany

2.3.1.1 EU

EU provisions provide a range of approaches for remediation and prevention. However, most of the frameworks are quite general. Nonetheless, some could still be used as examples for how to include certain aspects in international policies.

Prevention/Planning

Thematic Strategy for Soil Protection

The overall objective of protecting soil and using it sustainably is based on a number of guiding principles of precaution and prevention which could be adopted by international agreements. Elements it mentions include direct initiatives in the environmental field (e.g., the amendment of the Sewage Sludge Directive). It further supports the inclusion of soil protection into other policies, in particular the Common Agricultural Policy (CAP), and it also promotes a soil monitoring system combined with the development of new measures on the basis of the monitoring results.

Directive 2008/1/EC of the European Parliament and of the Council of 15 January 2008 concerning integrated pollution prevention and control

The integrated approach to preventing pollution has a more direct effect on the soil than agricultural law because it clearly provides limits for pollutants and is therefore relevant for up-scaling through the concept of standard setting.

Article 1 states that the Directive "lays down measures designed to prevent or, where that is not practicable, to reduce emissions in the air, water and land from [...] activities, including measures concerning waste, in order to achieve a high level of protection of the environment taken as a whole". With reference to this Directive, the General Court ruled that having a plan does not mean a Member State has satisfied its obligations. In cases of non-compliance, national courts should order the relevant authorities to establish a plan that will ensure that the period in which the pollution limits are exceeded is as short as possible.[339] This concept could be applied to international planning obliga-

339 (ENDS Europe DAILY (Wed. 19 November 2014) National Courts must seek air quality compliance – CJEU.–,)

tions to avoid land degradation and help ensure that the plans are ambitious or stringent enough to accomplish the LDNW target.

Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control)

The Directive contains several novel instruments worth being considered at the international level:

- Permitting procedure
- Emission limit values, which support integrated pollution prevention and control
- Monitoring obligations for owners and public authorities
- Baseline reports: these provide an instrument for monitoring soil pollution and shall "ensure that the operation of an installation does not deteriorate the quality of soil and groundwater" (according to Recital 24).

Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment

SEA is well-known in international frameworks. Therefore, it is not necessary to recommend it as new tool for upscaling. However, with regard to cross-bordering projects, the use of SEA in EU Member States might be relevant for further consideration.

Council Directive of 12 June 1986 on the protection of the environment, and in particular of the soil, when sewage sludge is used in agriculture (86/278/EEC)

The Directive contains specific regulations on sewage sludge and provides different types of emission limit values. It is of interest for upscaling in particular since it sets soil protection standards concerning the content of heavy metals.

Biocidal Products Regulation – EU 528/2012

This Regulation prevents the entry of dangerous substances into the soil and strictly follows the precautionary principle. With the REACH system of registration, evaluation and authorisation of chemicals, it provides a comprehensive lifecycle analysis for highly soil-damaging harmful substances.

Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste

Annex I provides details on ways how to achieve the protection of i.a. soil, and Section 3.1 notes that this can "be achieved by the combination of a geological barrier and a bottom liner during the operational/active phase and by the combination of a geological barrier and a top liner during the passive phase/post closure".

Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora

Avoiding pollution and the deterioration of agricultural soils are implicit preconditions for the protection or recovery of habitats and species under the Directive.[340] It aims to prevent soil contamination, erosion and sealing. Also it stresses the protection of certain areas from conversion and development benefits soils. Commercial projects in these areas are only possible if overriding public interests exist.

340 Bowyer, Catherine, Sirini Withana, Ian Fenn, Samuel Bassi, Megan Lewis, Tamsin Cooper, Patricia Benito and Mudgal Shailendra (2009): Land Degradation and Desertification. Study for the European Parliament, Policy Department Economic and Scientific Policy. IP/A/ENVI/ST/2008-23.

Therefore, although not directly applicable, the concept of protected areas and/or environmental restrictions in land use could be useful in upscaling land/soil protection to the international level, though the concept of protected areas and the requirement for sustainable land use already exist in some form.

The **2013 CAP** reform with its approach "to green" direct payments is an appealing approach as it supports the idea of increased sustainable land management through financial support conditioned on more stringent requirements. Benefits may be reduced or eliminated if such requirements are not respected, e.g., ecological focus areas comprising 5% of the total area for farms above fifteen hectares. The agri-environment-climate incentive scheme within Pillar 2 of the CAP is meant to encourage farmers to use sustainable practices which benefit society as a whole, namely by protecting and improving the environment, natural resources, soil and genetic diversity and landscapes. Aspects of this aid scheme could be transferred to the international level and complement or be integrated into the existing schemes, e.g., the GEF or World Bank. This focus on integrated management of farmland may help to support a better combination of land use and nature protection.

Furthermore, although not adopted, the drafted **Soil Framework Directive (2006)**[341] as well as its Spanish version from 2010[342] provide helpful wording and contextual support for topics like programmes of measures to combat i.a. erosion (Art. 8), the prevention of soil contamination (Art. 9), remediation (Art. 13) or national remediation strategies (Art. 14). According to Art. 13 para. 3, "Member States shall set up appropriate mechanisms to fund the remediation of the contaminated sites for which [...] the person responsible for the pollution cannot be identified or cannot be held liable under Community or national legislation or may not be made to bear the costs of remediation" (polluter pays principle). Also, the idea to set up a system to identify risk areas of erosion, organic matter decline, compaction, salinisation and landslides (Art. 6) could support awareness among Contracting Parties about the situation of their soils. The drafted Art. 6 para.1 foresaw that Member States "shall identify the areas in their national territory, at the appropriate level, where there is decisive evidence, or legitimate grounds for suspicion, that one or more of the following soil degradation processes has occurred or is likely to occur in the near future". Additionally, for the purposes of preserving the soil functions, "Member States shall in respect of the risk areas identified, draw up, at the appropriate level, a programme of measures including at least risk reduction targets, the appropriate measures for reaching those targets, a timetable for the implementation of those measures and an estimate of the allocation of private or public means for the funding of those measures" (Art. 8 para. 1).

Remediation

The **Environmental Liability Directive** provides some elements for up-scaling as it is based on the "Polluter pays principle". Liability is therefore not dependent on whether the environmental good belongs to someone's property. Public authorities are obliged to act on behalf of private responsible.

In its Annex II ("Remedying of Environmental Damage"), the Directive addresses the remediation of land damage in detail. Necessary measures shall be taken to ensure the removal, control, containment or diminishment of the relevant contaminants. In addition, Annex II, Section 2 notes that the presence of such risks for human health needs "risk-assessment procedures taking into account the characteristic and function of the soil, the type and concentration of the harmful substances, prepa-

341 European Commission Proposal for a Directive of the European Parliament and of the Council establishing a framework for the protection of soil and amending Directive 2004/35/EC, COM(2006) 232 final.

342 6124/1/10 REV/ 1 from 4 March 2010, Council oft he European Union.

rations, organisms or micro-organisms, their risk and the possibility of their dispersion".[343] For upscaling, the question raised by the Directive whether instruments applicable to old damages are needed, should be included. An artificial retroactive effect could strengthen the effectiveness of instruments for a LDNW.

2.3.1.2 Germany

Germany provides a variety of hard and soft law measures which could serve as a basis for upscaling. Germany has some unique instruments, such as its complex system of landscape planning, impact mitigation regulation ("Eingriffsregelung") and trading certificates for land. Circular Flow Land Use Management is a concept that was first tested in Germany and now exists in Italy, Austria, Poland, Slovakia and the Czech Republic.

Other countries and EU regions that face challenges similar to Germany (land take, densely populated, demographic change, etc.) may find these instruments interesting or potentially suitable for application in their territories. However, Germany's complex spatial and landscape planning system is difficult to transfer due to its complexity and formalised structure tailored to the German federal system. It may therefore only be transferable to a limited extent, especially with its specific distribution of competences across different levels. Similar tools and instruments could be adapted to the institutional context, however, though this would be dependent upon political will. Administrative capacity to manage and enforce a complex system would be necessary as well. Where relatively effective spatial planning systems are already in place, some of the tools and instruments used or tested in Germany could potentially help to further increase their efficiency and effectiveness.

Prevention and Planning

- The soil protection clause § 1a para. 2 of the Federal Building Act (BauGB) could serve as an example of a comprehensive approach to protecting against soil erosion, sealing and contamination due to infrastructure and building development which could contribute to international obligations.
- The Federal Building Act is also linked to the Federal Nature Conservation Act (BNatSchG), which requires compensation for environmental impacts from building measures (remediation according to § 13 of the BNatSchG – the impact mitigation regulation)
- The amendment of the Federal Building Act in 2013 also allows for temporary limits on building permission. The amendment intends to further strengthen the requirement that new building developments take place within existing settlements, e.g. by requiring a written justification if agricultural and forestry areas are to be converted. This amendment supports the recycling of sites and is directly linked to Art. 15 para. 3 of the Federal Nature Conservation Act, which aims to avoid land take of forestry and agricultural sites as far as possible.
- The Fertiliser Decree (DüV) provides the rules and code of good practices for using fertilisers and growing substrates on farmland. It also provides for mitigation of risks from such substances. The focus on fertiliser limits rather than just land use practices is promising to reduce the risk of land degradation.
- Designation of risk areas to support soil protection as outlined in § 3 Nr. 6 of the Federal Spatial Planning Act (ROG).
- With the impact mitigation regulation (§ 13) or the regulations for landscape planning (§§ 11-12) of the Federal Nature Conservation Act, land/soil degradation may be prevented or balanced

343 European Union Directive 2004/35/EC of the European Parliament and of the Council of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage, Official Journal L 143/56.

through remediation. Other preventive instruments are provisions for biotope networks (§ 21) and protected areas (§ 32).
- Eco-accounts (Ökokonto), according to §§ 16 and 18 to 21 of the Federal Nature Conservation Act as well as § 200a of the Federal Building Act, are instruments that could be useful for upscaling to the international level as they provide a way for local actors to anticipate damage to land and acquire resources or sites to mitigate or compensate for any unavoidable harm that occurs.
- Additionally, the Federal Nature Protection Act provides instruments to control behavior indirectly (Flächen- und Biotopschutz)

German *soft law measures* could also provide potential measures for upscaling to the international level:

- Harmonisation of site categories to facilitate comparison of degradation losses.
- Brownfield site assessments to evaluate potential land recycling and urban development. Land recycling also included in planning policy.
- An example of identification of risk areas can be found in the former Draft Soil Framework Directive (Art. 6).
- Compensatory measures under the Federal Nature Conservation Act (§§ 13-16), such as better landscape planning, land recycling measures and offsetting building sites with unsealing and restoration actions on another site.
- Economic instruments, such as a trading system of site certificates, building site designation and/or development charge, and sealing charge, could also support prevention and planning against land degradation.
- Better implementation and enforcement of obligations is necessary for these measures, which requires capacity and support of administrative bodies. Appropriate measures to raise awareness about the importance of soil for human and ecosystem survival, and promote the transfer of knowledge and experience for a sustainable use of soil are an important, if not an underestimated tool.
- Cooperation between countries could be strengthened.

Remediation

The Federal Soil Protection Act foresees requirements to avert dangers and describes duties for remediation. In addition to remediation measures under § 2 are measures against removal and to minimise harmful changes to soils. For complex remediation of contaminated sites, the law provides for administrative measures like examinations and remediation plans. The Federal Nature Conservation Act also provides for eco-accounts, which could be useful for reserving sites at the local level and using those as offsetting or remediation for unavoidable harm done on other sites within the local area.

2.3.2 United States

US legislation is relevant to land degradation neutrality in many respects, particularly from the perspective of prevention of land degradation. However, none of the laws are relevant for direct upscaling onto the international level in order to implement the LDNW target. Many of the laws are too contextually specific to the US context either in terms of the structure of the legal system or issues targeted. Some laws are only focused on particular types of land (e.g., high-risk soils, wetlands, forests, or agricultural land) and/or only address a particular soil threat such as contamination or erosion. Below are some of the conceptual approaches which were used in the US laws that could potentially be used and integrated into a comprehensive approach to the LDNW target at the international scale.

Prevention

- Designation of protected areas, which was instituted under the Title 16 National Landscape Conservation System. This obligation is already found under the CBD and it could contribute to prevention of land degradation, but only in those specific areas.
- Sustainable management contracts can be agreed with private actors regarding their land management as found under the Title 16 Soil Conservation and Domestic Allotment Act, but this may not be suitable for all systems where different ownership structures may affect the legality of contractual relations with agricultural producers and it only targets working land rather than land degradation more broadly.
- Adding an EIA (or EIS under NEPA) obligation to the UNCCD could close that gap in the international agreements as both the UNFCCC and the CBD contain this requirement. However, this mechanism, while useful for providing a procedural check before action which may have a significant environmental impact occurs, may not actually reduce the amount of land degradation if the government is able to go ahead with the degrading action anyway rather than choosing the alternative with less impact. The citizen suit mechanism to challenge the government's failure to conduct an appropriate environmental assessment is similarly not that effective if it is after the fact, so the damage is done anyway, but it may provide a good disincentive to ignore the proper procedure in order to avoid lengthy, expensive litigation. However, this may be too specific to the US legal system as private citizens may not be allowed standing to challenge governmental actions in other countries.
- Mandatory compliance measures on high-risk lands to prevent degradation are seen in the conservation compliance provisions of the Farm Bill, but these only target highly-erodable land and wetlands, thereby limiting the scope of land covered and the soil threats addressed. The fact that governmental subsidies are conditioned on compliance with the mandatory measures can be a useful approach to ensure compliance, but this would depend upon availability of funds and enforcement/monitoring of whether the obligations have been met.
- Funds made available under the Farm Bill for voluntary actions in the public interest, e.g., set-asides, sustainable agricultural practices, legal protection against conversion of land could also be useful, though the first two are not particularly novel to the US context. However, easements or legal protection against conversion could be a useful tool to protect certain areas against degradation (i.e., sealing, contamination), but this is dependent upon the landowner agreeing or having the ability to grant an easement that is binding and moves with the land.
- Government funding to incentivise or leverage collective action or public-private partnerships could be very useful given the large deficit of public funds that are available to carry out comprehensive programmes or efforts. This could also increase the acceptability of solutions due to the integration of a broader range of stakeholders into the process.
- Setting water quality standards as done under the CWA that influence land-based actions as non-point sources of pollution is a good idea, but this relies on enforcement and monitoring of the various standards.
- Permitting schemes are not particularly novel, but they could be useful if an example is needed regarding regulated conversion of certain land types (e.g., wetland conversion under the CWA) and actors who conduct potentially extremely dangerous and harmful activities (e.g., generating, storing, transporting and disposing hazardous waste under the RCRA).
- A tracking system with information reported by each actor along the chain (e.g., tracking hazardous waste movement from "cradle-to-grave" under RCRA) could be useful to help prevent contamination, but it would be of limited relevance for the other sources of land degradation.

Remediation

Remediation was a category lacking a substantial number of international provisions, so the US legislation provided some examples of useful mechanisms that could fill this gap in implementing the LDNW target.

- The CERCLA statute allows for a large amount of funds to be collected through a tax on the industries producing and selling the hazardous products which may lead to contamination, e.g., similar to the polluter pays concept but their financial contribution is before harm has occurred and based on the high risk of harm presented by their activities. Those funds are then available for quick governmental response to hazardous environmental incidents. Also available under RCRA, a cost-recovery mechanism is then provided for the government to claim reimbursement for cleanup from the responsible actor. These provisions are specific to contamination and may be too specific to the US legal system where the government is able to bring a claim against a private legal person or private legal persons are handling hazardous materials rather than the government directly disposing of it.
- Funding provisions are provided for remediation under the Forest Landscape Restoration Act, for example, in the form of low-interest loans, cost-share agreements, and reimbursement of private actors for restoration costs. These provisions are dependent on governmental funding as well as the ability of private landowners or users to contract regarding their land and additionally contract with the government.
- Participatory planning is not novel, but an example of this within the realm of remediation actions is found under the Forest Landscape Restoration Act as well.
- Offsetting for wetland conversion under the CWA or non-compliance with restrictions under the Farm Bill conservation compliance programme is a useful tool which could help balance the amount of wetlands that are in existence. Quality standards and monitoring/enforcement would need to be established though to make sure the substitute wetland was of equal or greater ecological value as the destroyed wetland.

Planning

The planning provisions which are novel to the US system are also extremely contextual to the decentralised way that land uses are planned and controlled by the local planning commissions of the municipalities. Comprehensive long-term planning of existing and future land uses is not novel, but rather this would be a standard approach for designating certain uses throughout a landscape in order to identify where pressures exist and which would be the most appropriate use for different types of land. However, zoning ordinances designating certain areas of the city for specific uses in accordance with the comprehensive land use plan are potentially useful in some instances, but the fact that local actors who may have varying degrees of professional skill with regard to planning cities are making the decisions about development without significant oversight from a higher centralised actor might make this too specific to the US system.

2.3.3 Brazil

None of the analysed Brazilian laws appears to be of immediate relevance in terms of its suitability to serve as a model at the international level. Most laws discussed here are too broad in their protective scope (e.g. Brazil's National Environmental Policy (Law No. 6,938/1981), which adopts an integrated approach to the preservation and restoration of environmental resources or the Federal Constitution) or are tailored to national circumstances (such as particular regions of the state and their respective needs as highlighted in the Federal Constitution). Other laws focus on one resource only (e.g. water) and are thus of limited value for upscaling purposes. In addition, many of the addressed issues are

already dealt with at the international level (e.g. environmental impact assessments which are addressed in, for example, the Federal Constitution or in CONAMA Resolution 001/86).

- Generally, the analysis of the Federal Constitution, CONAMA Resolution 001/86 and the National Environmental Policy did not come up with compelling elements for the purpose of contributing to the LDNW objective.
- Also Law No. 9,985/00 on the Brazilian Nature Conservation System appears to be too broad. Furthermore, the water and waste laws (Law 9,433/97 and Law No. 12,305/2010) seem to be of limited suitability given that they have a specific focus and only superficially deal with land and land degradation.

An instrument focusing exclusively on land degradation was not identified. However, certain elements of the laws could nonetheless be looked at for upscaling purposes.

Prevention

Most laws analysed directly or indirectly contribute to the prevention of land degradation. Thereby, their focus is mainly on preventing soil erosion and/or soil contamination (e.g. CONAMA Resolution 001/86 or National Environmental Policy, Law No. 6,938/1981).

- The rules of CONAMA Resolution No. 420/2009 on soil monitoring could, potentially, provide an added value at the international level. In that respect, also the Forest Code's rules on APPs and LFRs or the introduction of Forest Reserve Credits could, potentially, be used as models for international approaches. Their focus on forests, however, presumably reduces this suitability.
- By comparison, the Atlantic Forest Law is suitable in so far as it contains rules stating that the removal of vegetation shall primarily take place on land that is already substantially degraded (cp. Article 12 of Law No. 11,428/2006); these could be further developed to fill existing gaps at the international level.

Remediation

Several Brazilian laws analysed also have rules on the remediation of damage to environmental resources.

- Amongst these laws are the Federal Constitution, the National Environmental Policy (Law No. 6,938/1981), CONAMA Resolution 420/09, the Forest Code (Law No. 12,651/2012), the Atlantic Forest Law (Law No. 11,428/2006), Decree No. 59,263 on Contaminated Areas, or the Brazilian Nature Conservation System (Law No. 9,985/2000).
- The approaches adopted therein, such as the liability approach of the National Environmental Policy (Law No. 6,938/1981), the National Policy on Water Resources (Law 9,433/97) or the Brazilian Solid Waste Management Policy (Law No. 12,305/2010 and Decree No. 7,404/2010) for environmental degradation, are of great importance but not per se innovative or novel approaches.

Some laws do, however, provide potentially suitable and interesting elements that could be useful models for the adoption of international rules.

- The procedures for the identification of contaminated land established by Decree No. 59,263, for example, could, potentially, be upscaled to the international level – despite its focus on human health. In view of the soil threat contamination it could provide useful monitoring incentives and guidance on transparency in contamination-related aspects of land degradation.

Planning

Several legal instruments analysed establish rules with details on the setting up of plans. Some of them could be of direct or indirect relevance in view of land degradation.

- In view of desertification but potentially applicable to other soil threats, Law No. 8,171/91 (Agricultural Policy) provides a number of planning approaches such as the approach taken in order to create registers for areas affected by desertification and the adoption of appropriate management plan for the use of technologies that can stop the process of desertification.
- In terms of contamination, the Brazilian Solid Waste Management Policy is an example for the preparation of solid waste plans by states and municipalities.
- Similarly, the National Policy on Water Resources (Law 9,433/97) determines that Water Resources Plans shall be set up as long-term plans.

CONCLUSION

The three case studies analysed in this report resulted in examples of national legislation which contribute to prevention, remediation, and planning against land degradation. The laws varied in terms of whether they covered one or all of these categories, and they also varied in the scope of soil threats addressed. Of the many soil threats which exist globally, only the following were included in the analysis: soil erosion, contamination, sealing, and salinisation. Wetland destruction was mentioned in the analysis in some relevant cases due to the special role wetlands and organic soils play in landscapes and the water and climate cycles.[344]

Overall, none of the individual national laws was found to be suitable for direct upscaling to the international level in order to implement the LDNW target. While each country's legal system is unique and there were specific reasons as to why the laws were found to be unsuitable for upscaling, many similarities existed across the case study countries as well. Below are some examples of similar reasons which posed an obstacle to adoption of the national legal instruments at international level as a way to implement the LDNW target.

- National laws were too embedded within their respective national legal structures. For instance, the land use planning and zoning laws in the United States are highly decentralised stemming from the system of federalism and are therefore instituted in the form of municipal ordinances implemented by local planning commissions.
- Many of the laws identified were too specific in terms of the scope of land which was covered, e.g., multiple Brazilian laws specifically targeted only forest land.
- Additionally, many of the laws identified were too specific in terms of the soil threat issue they were addressing, e.g., the RCRA from the US which only addresses contamination from solid and hazardous waste disposal.
- Some of the laws highlighted in the analysis were too broad or general in their coverage to be useful in contributing to land degradation neutrality.
- Laws were also identified which provide procedural requirements which are aimed at combating environmental harm or land degradation more specifically, but due to the lack of substantive requirements, they were unlikely to have much of an impact on LDN. For example, the NEPA law from the US only requires that government agency actions which might cause a significant impact on the environment be considered in the decision-making process, but the least harmful option need not be adopted; thus, degradation may occur regardless.

However, many of the laws offered elements or mechanisms which could potentially be integrated into a comprehensive international scheme designed to address land degradation and implement the LDNW target. Some examples of the conceptual approaches identified which could be useful at the international level are:

- Permitting schemes for potentially harmful activities, e.g., for actors handling wastes, industrial installations, to convert wetlands to other uses, to discharge pollutants, etc.
- Determination of emission limit value
    - Determination of specific environmental quality standards, especially for soil and water
    - Determination of monitoring requirements

344 Ramsar Convention, The Importance of Wetlands, http://www.ramsar.org/about/the-importance-of-wetlands.

- Requirement of a baseline report which documents the status of soil and groundwater before a potentially harmful activity is started combined with the obligation after the cessation of the operation to remediate negative effects to achieve the former status of soils and groundwater
- Mandatory conservation compliance measures in exchange for government payments as a means to allow e.g. farmers to abide by the standards
    - Determination of standards for certain land uses, e.g. agriculture
    - Pesticides, biocides, sewage sludge, nitrate
- Land use planning for designated uses as well as protected areas
    - Protection of land/soil of specific values: prohibition on use
    - Determination of areas which are already degraded: open for primary use
    - Detrimental projects are only allowed if public interests are overriding
- Urban planning requirements combined with an EIA and an offsetting obligation already during the planning phase
    - Obligation to primarily use already developed areas
- General offsetting requirement for degradation of a parcel of land
    - Need for indicators for land degradation and remediation: Eco-account approaches
- Obligation to remediate existing land degradation
    - Obligation for private and public actors, including the owner of the land, independent of whether he or she has caused the damage
    - Obligation of competent authorities to remediate the damage and gain reimbursement rights against the responsible private actors
    - If necessary, also for old brownfields sites
- Specific regulatory provisions for certain land cover types, such as forests or wetlands
- Planning instruments for the achievement of LDNW
    - Determination of main drivers of land degradation
    - Determination of programmes of measures
        - Reduction of land degradation
        - Remediation of land degradation
        - Balance has to be zero
- Funding mechanisms which provide for private actors to manage land using practices in the public interest or remediate degradation, e.g., through cost-sharing, low-interest loans, or partial reimbursement by the government, and innovative economic instruments
- Procedural mechanisms that require environmental impacts to be taken into account during the decisions-making process, i.e., EIA and SEA, including plans for activities which might cause land degradation
- Setting land/soil and water quality standards, which would require land-based modifications of use in order to reduce non-point source pollution levels
- Information-gathering systems
- Recordkeeping, reporting, tracking systems (e.g., hazardous waste movement), and transparent decision-making process using participatory approaches
- Taxation or monetary mechanisms to build up large funding reserves which can be used by government actors to address dangerous pollution incidents quickly rather than wait for the responsible private actor, as well as a cost-recovery mechanism to seek reimbursement for response costs.

These mechanisms could be integrated into a more comprehensive international instrument in order to implement the LDNW target. Of the international agreements analysed in this study, the UNCCD is thematically aligned with the achievement of LDN as it is already aimed at combating land degrada-

tion and offers multiple examples of provisions which target prevention, remediation/offsetting and planning against land degradation. Thus, integrating the LDNW target into the agreement would not require extensive amendments to the focus of the relevant provisions. The UNFCCC or CBD are both focused on other topics (respectively, climate change and biodiversity conservation). However, the UNCCD is limited in its coverage of land worldwide, applying to drylands in affected country Parties. If developed country Parties begin to take on increasingly similar obligations to the affected country Parties, the distinction between the two types of Parties becomes useless and misleading. Additionally, it could call into question the funding structure under the UNCCD whereby the affected country Parties' fulfilment of obligations depends on financing from the developed country Parties. If the developed country Parties incur comprehensive and ambitious obligations of their own, the funding structure would become less justifiable. Yet proposals to revise the current structure would most likely pose a significant obstacle to implementation of the LDNW target through the UNCCD as affected country Parties would assumedly not be eager to lose their funding support. The agreement has also undergone modifications to try to strengthen its prevailingly weak instruments (e.g., 10-Year Strategy), and global rates of land degradation and desertification continue to rise, pointing to a lack of effectiveness of the Convention. This precedent demonstrates that it would likely be quite difficult to achieve adoption of any strong obligations under the UNCCD agreement, such as ambitious implementing mechanisms and obligations, let alone to achieve the LDNW target.

The CBD presents another option for integration of the LDNW target. In its focus on conserving and enhancing biological diversity, it encompasses the avoidance/prevention and remediation of land degradation, which affects biological diversity. Adoption of a protocol under the CBD is possible in accordance with the enabling clause and as demonstrated by the Convention's adoption of two prior protocols. The CBD was also strengthened through modifications to its implementation (e.g., Aichi biodiversity targets), so it seems more likely that ambitious implementing mechanisms and obligations could be adopted under this agreement. However, global biodiversity is still being lost despite the implementation of this Convention, so this agreement faces a lack of effectiveness as well, which may make it difficult to achieve the LDNW target under the CBD. The general scope of the Convention applies to all country Parties rather than distinguishing between different categories of countries in terms of biodiversity levels, thereby widening the potential coverage if the LDNW target were adopted under the CBD.

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