



Re-Imagining soils sustainable futures: a critical inquiry at the science-policy interface for soils re-politicisation

by Mariana Gonzalez Lago

A thesis submitted for the degree of
Doctor of Philosophy in
Sustainable Futures

Under the supervision of Brent Jacobs, Roel Plant
and Martin Blumenthal

Institute for Sustainable Futures
University of Technology Sydney

June 2022

Certificate of Original Authorship

I, Mariana Gonzalez Lago declare that this thesis, is submitted in fulfilment of the requirements for the award of Doctor of Philosophy in Sustainable Futures, in the Institute for Sustainable Futures at the University of Technology Sydney.

The thesis is wholly my own work unless otherwise referenced or acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

This document has not been submitted for qualifications at any other academic institution.

This research is supported by the Australian Government Research Training Program.

Production Note:

Signature: Signature removed prior to publication.

Date: 03/06/2022

Acknowledgments

This research could not have been possible without the support and guidance of many people to whom I am deeply grateful.

First, I want to express my gratitude to all the participants in New South Wales and Uruguay for dedicating their time to sharing their knowledge and experiences that have nurtured this dissertation.

A heartfelt thank you to my supervisors, Brent Jacobs, Roel Plant and Martin Blumenthal, for your generosity, patient support and academic guidance throughout these years. Your constant feedback and encouragement helped me find a way to see the light after an intense and challenging journey. I am deeply grateful for your empathy and support during the hardships of the Covid-19 lockdowns in Australia.

My gratitude to the Institute for Sustainable Futures and the University of Technology Sydney for offering the UTSP and IRS scholarships that made this research possible.

A special thank you to the New South Wales Soils Knowledge Network (NSW SKN) for supporting and collaborating with this research.

I am grateful to the South American Institute for Resilience and Sustainability Studies (SARAS) for giving me the opportunity to share and discuss my research with peers and leading scholars in sustainability science and the environmental humanities. Thank you for supporting the creation of the Socio-ecological Co-creation Network for Latin America (RESACA) to foster collaboration in transdisciplinary and sustainability research. To all the members of RESACA, it has been a joy to share experiences and learn from you in the past years.

To Cristina, for your friendship and guidance in finding new and captivating research pathways.

To Paloma and Evelyn, for your unconditional companionship throughout all these years in which we navigated the PhD experience together.

To my dear friends in Australia, Belen, Ernesto, Marie, Oxana and Paola. Gracias por haberse convertido en un refugio lejos de casa.

I am grateful to my friends and family in Uruguay and other parts of the world who have been there, showing their support and finding the time for a chat or sharing a “mate” online.

To my grandmothers, Manola and Chola, your kindness and fortitude are my sources of inspiration, las llevo conmigo siempre.

To my parents, your unconditional love, trust, and support have given me the courage to pursue my interests, los quiero con toda mi alma.

To Diego, I would not have come this far without your encouragement and love. Thank you for being a patient listener and helping me think “outside of the box” to overcome each difficulty that appeared along the way.

List of Papers

Paper I

Gonzalez Lago, M., Plant, R., Jacobs, B. (2019). Re-politicising soils: What is the role of soil framings in setting the agenda? *Geoderma*, 349, 97-106.

Statement of Contributions of Authors

We, Roel Plant and Brent Jacobs attest that the PhD candidate Mariana Gonzalez Lago was the principal contributor to the conception, design, writing and revision of the manuscript:

Gonzalez Lago, M., Plant, R., Jacobs, B. (2019). Re-politicising soils: What is the role of soil framings in setting the agenda? *Geoderma*, 349, 97-106.

Production Note:
Signature removed
prior to publication.

Signature
Dr Roel Plant

Production Note:
Signature removed
prior to publication.

Signature
Dr Brent Jacobs

Table of Contents

Certificate of Original Authorship	ii
Acknowledgments	iii
List of Papers.....	v
Statement of Contributions of Authors	vi
Table of Contents	vii
List of Tables	x
List of Figures.....	x
List of abbreviations and acronyms	xi
Abstract	xiii
Chapter 1	1
Introduction	1
1.1 Research purpose	5
1.2 Research design: introduction to the theory, conceptual framework and methodological approach.....	6
1.3 Research questions	9
1.4 Thesis structure	10
Chapter 2	13
A soil story told through three challenges	13
2.1 The social-ecological challenge.....	14
2.1.1 Human life and soil liveliness: interdependent natures	15
2.1.2 Soils vital functions and processes.....	18
2.1.3 Characterising human-induced soil degradation	25
2.1.4 Conclusions.....	33
2.2 The global governance challenge	34
2.2.1 Conceptualising soil governance.....	35
2.2.2 Global soil governance: a historical perspective	40
2.2.3 A timid momentum	46
2.2.4 Conclusions.....	51
2.3 The public policy challenge	53
2.3.1 Exploring reasons for soil neglect in public policy	54
2.3.2 A constructive approach to policy problems.....	59
2.3.3 Politicising public problems: a policy process perspective.....	73
2.3.4 Conclusions.....	81
2.4 Synthesis of the literature review	82
Chapter 3	83
What is the role of soil framings in setting the agenda?.....	83

Chapter 4	96
Research Design	96
4.1 The Politics of Framing Framework (PoFF)	97
4.2 Research questions	113
4.3 Methodology	116
4.4 Case studies: setting the boundaries.....	117
4.5 Data gathering methods.....	123
4.6 Data collection process	125
4.7 Analytical process	132
4.8 Ethical considerations.....	134
4.9 Challenges.....	134
4.10 Conclusions	135
Chapter 5	137
Tracing the career of soils in the New South Wales policy arena: a political ontology perspective	137
5.1 Problematising soils de/politicisation	140
5.2 The career of soils in the NSW policy arena.....	147
5.2.1 Soils politicisation: reversing degradation and securing food production	148
5.2.2 Soil depoliticisation: displacing responsibility	152
5.2.3 The formation of a policy window.....	158
5.3 Exploring a failed attempt at re-politicising soils with a political-ontological lens.....	162
5.3.1 The soils policy proposal “Looking Forward, Acting Now”	163
5.3.2 Soils political ontology: ‘the glue that binds’ all terrestrial ecosystems	166
5.3.3 Normative considerations	169
5.3.4 The shift of government and a covert political-ontological dissensus	171
5.4 Conclusions.....	174
Chapter 6	178
Keeping soils captive: concealing their political condition	178
6.1 Two interrelated views on power.....	181
6.2 New South Wales: present context	189
6.3 Exploring the role of power in current soils framings	192
6.3.1 Strategic framings and agenda control: from an unbreakable resource to an eco-technological fix for climate change mitigation	192
6.3.2 Private interests and policy lock-in.....	200
6.3.3 Incomplete information and policy subsystem biases.....	207
6.4 Conclusions.....	212
Chapter 7	216
Justice for soils: exploring emergent notions from the Uruguayan case	216
7.1 Justice in the Anthropocene	219
7.2 Uruguayan soils: past and current trends.....	229

7.3 What justice for soils?	233
7.3.1 From predatory to sensible extractivism: taking responsibility for soils restoration	234
7.3.2 A fragmented recognition	244
7.3.3 Soils representation through an equation	249
7.4 Conclusions.....	254
Chapter 8.....	257
Discussion.....	257
8.1 About the PoFF: Connecting political ontology, power and justice	260
8.2 About soils political ontologies at the science-policy interface.....	266
8.3 About power and soils politics	270
8.4 About soils justice and awareness creation	273
8.5 Conclusions.....	277
Chapter 9.....	278
Conclusions.....	278
Research Contributions.....	283
Limitations	286
Further research	286
Concluding remarks	287
Bibliography	288

List of Tables

Table 2. 1 Soil Ecosystem Services	21
Table 2. 2 Summary table: epistemological approaches to policy analysis and policymaking.....	69
Table 2. 3 Vesely’s “problem delimitation” approach	79
Table 4. 1 List of Interviewees	130

List of Figures

Figure 2. 1 Framework for the provision of ecosystem services from soil natural capital.	23
Figure 2. 2 Global assessment of human-induced soil degradation (GLASOD)....	29
Figure 2. 3 International development of soil governance timeline.	45
Figure 2. 4 Peters' design framework for public policy.....	74
Figure 4. 1 The Politics of Framing Framework (PoFF).	108
Figure 4. 2 Structure of empirical chapters	115
Figure 4. 3 Main degradation issues in NSW within soil monitoring units.	120
Figure 4. 4 Comparison of the state of soil degradation in Uruguay between 2000 and 2015.....	122
Figure 5. 1 The Political Ontology dimension of the Politics of Framing Framework.	142
Figure 5. 2 Timeline of the metamorphoses and amalgamations of the Soil Conservation Service.....	155
Figure 5. 3 NSW Soils Policy Looking Forward, Acting Now approach to soils management: Objectives and Strategies.....	166
Figure 6. 1 The Power dimension of the Politics of Framing Framework.	183
Figure 7. 1 The Justice dimension of the Politics of Framing Framework.	224
Figure 8. 1 The framework’s contribution to exploring the political difference. .	265

List of abbreviations and acronyms

ABARES	Australian Bureau of Agricultural and Resource Economics
CBD	Convention on Biological Diversity
DINAMA	National Directorate of the Environment of Uruguay
DAFF	Australian Government Department of Agriculture, Fisheries and Forestry
DPI	New South Wales Department of Primary Industries
DPIE	New South Wales Department of Planning
EPA	New South Wales Environment Protection Authority
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
GEF	Global Environment Facility
GLADA	Global Assessment of Lands Degradation and Improvement
GLASOD	Global Assessment of Soil Degradation
GSP	Global Soil Partnership
INIA	National Agrarian Research Institute of Uruguay
IPBES	Intergovernmental Panel of Biodiversity and Ecosystem Services
IPCC	Intergovernmental Panel on Climate Change
ITPS	Intergovernmental Technical Panel on Soils
LADA	Land Degradation in Drylands
LDN	Land Degradation Neutrality
MGAP	Ministry of Livestock, Agriculture and Fisheries of Uruguay
MEA	Millennium Ecosystem Assessment
MSA	Multiple Streams Approach
MVOTMA	Ministry of Housing, Land Management and Environment of Uruguay
NRM	Natural Resource Management
NSW	New South Wales
OEH	New South Wales Office of Environment and Heritage
PNA	National Plan for the Promotion of Agroecological-Based Production in Uruguay
SCA	Soil Conservation Act of New South Wales
SCS	Soil Conservation Service of New South Wales
SDGs	Sustainable Development Goals
Soil CRC	Australia Soil Cooperative Research Centre for High Performance Soils
SUMPs	Soil Use and Management Plans of Uruguay
TEEB	The Economics of Ecosystems and Biodiversity
UNCCD	United Nations Convention to Combat Desertification
UNCED	United Nations Conference on Environment and Development
UNFCCC	United Nations Framework Convention on Climate Change
UNEP	United Nations Environment Programme
USLE	Universal Soil Loss Equation
RUSLE	Revised Universal Soil Loss Equation
WBGU	German Advisory Council on Global Change
WWF	World Wide Fund for Nature International
ZNLD	Zero Net Land Degradation

Abstract

Soils, the primary element on which all forms of terrestrial life depend, are now reaching critical thresholds, with one-third of global soil resources moderately to highly degraded. However, they remain “nearly forgotten” in the political domain and almost imperceptible to increasingly urbanised societies, persisting as a “dead matter” of seemingly little interest. This research aims to make visible the political nature of soils and the necessity to bring them into the policy arena to protect the sustainability of their vital functions and processes. To do so, it seeks to understand how framings are purposefully mobilised by actors at the science-policy interface to de/politicise soil issues affecting agenda setting processes and their overall protection. This dissertation presents a novel heuristic device for critical inquiry into soils framings: the Politics of Framing Framework, which combines approaches from political and social sciences, political ecology, and environmental humanities. This tool offers an organising principle in the analysis of framings through the exploration of three dimensions: political ontology, power, and justice. The premise is that by unpacking how these dimensions operate in soils framings, we will be in a better position to understand which visions of human-soils relationships are being actualised in reality and which are being silenced, how power is mobilised in those framings and what notions of justice are implied for guiding action. Using the PoFF, this research analyses how ontology, power and justice: 1) operate in the social construction of soil as a public policy problem in two jurisdictions: New South Wales, Australia, and Uruguay. 2) Their connection with processes of de/politicisation. 3) Their impacts in terms of agenda-setting and policy formulation. The findings show that, first, framings are used at the science-policy interface as strategies of de/politicisation to legitimise policy choices that exclude or include soils into the policy agenda and contribute to shaping public perceptions about their (un)importance. Second, soils’ productivist political ontologies are dominant in the policy arena, but there are nuances. Although the experts tend to share this view with policymakers, there are important differences in their interpretations of its implications. Third, under a neoliberal regime such as that of NSW, depoliticising strategies exclude soils from the policy agenda by

framing them as a non-political and an apolitical issue, reaffirming the status quo. Fourth, the Uruguayan case shows that soil politicisation can be achieved when the government assumes an active role in their protection and framings at the science-policy interface regarding the conservation rationale align.

Keywords: Soils, politics of framing, de/politicisation, agenda setting, public policy

Chapter 1

Introduction

“When we look at soil, we see only the dirt but if you look deeper you will see a whole cosmos emerge. There is a rich vibrant society of organisms, elements and atoms working together to create a substance that forms the basic ingredients needed by life...a grain of soil can constitute an entire ecosystem”
(Shikongo, 2017)

In recent years, we have witnessed the (re)emergence of international community concern regarding soils sustainability and security and their attempts to increase public awareness through concerted action. However, these efforts have gained little traction in the global, national, and sub-national sustainability policy agendas, to which the significance of soils conservation and protection is often variable. Few countries have specific legislation explicitly addressing soils (Montanarella, 2015), although most have some type of soil protection policy usually embedded in other legislative instruments or policy sectors such as agriculture and territorial planning (Peake & Robb, 2021). Overall, soils have been a low priority issue within the environmental sector, and their inclusion in public policy is relatively weak (FAO & ITPS, 2015), leading to the recurrent claim from experts, international organisations in global environmental governance and soils-related NGOs that we have taken the soil beneath our feet for granted.

Soils are a vital resource for life on Earth. Not only do they host one-quarter of the world's biodiversity, and thus are one of the most diverse habitats on Earth – “[a] handful of dirt can contain more organisms than the world has people” (Fromherz, 2012, p. 964) –, they are also the basis for most of the global food production and fundamental to sustainability through their sustenance of social-ecological systems (Dominati et al., 2010; FAO, 2015b; Lehmann et al., 2020). Soils perform a vast range of ecosystem services, from support (soil formation, primary production, biodiversity maintenance, nutrient cycling), regulation (flood control, waste recycling, climate regulation, erosion prevention, resistance to pests and diseases), provision (food, water, fibre, fuel and raw earth material supply, surface stability, refugia, genetic resources), to cultural services (aesthetic, spiritual, knowledge, sense of place, heritage values, identity), and therefore, they have a critical role in ecosystem service delivery (FAO & ITPS, 2015; MEA, 2005; Montanarella & Vargas, 2012).

Humankind has historically benefited from soils, and our existence relies on their capacity to perform critical functions and processes. But the domestication of Earth's soils throughout history, since early agriculture and construction commenced some 10,000 years ago, has altered soils' chemical, physical and biological conditions (Richter & Tugel, 2012). Consequently, over much of the Holocene, the soil has been transformed into a human-natural system (Richter et al., 2015) in a process known as “global soil change” (Arnold et al., 1990). Today, the capacity of soils to perform their functions and processes is seriously threatened by the continuous pressure from poor land use and soil management practices, the exponential growth of the human population, the rapidly growing demands for protein, fibre and bioenergy, and competing land uses like energy production, housing and infrastructure, nature protection, mining and industrial activities (Montanarella & Vargas, 2012). These persistent anthropogenic pressures on soils have greatly intensified in the last century, now reaching unprecedented critical limits that affect the ecosystems they provide and support (FAO & ITPS, 2015; IPBES, 2018; IPCC, 2019; MEA, 2005).

But why should we care about soil protection? Contrary to common belief, from a human life perspective, the soil is an exhaustible resource. When the natural capacity of soils to form and regenerate is disturbed, and their services are exploited for short-term gains, they cannot be replenished within a human lifetime. Soil formation rates are extremely slow compared to human time scales as they span extended geological timeframes, taking hundreds of years (it can take up to 400 years to produce 1 cm depth of soil) to recover existing soils (Cedraz de Oliveira, 2017; Ellis & Mellor, 1995). As Arnold et al. (1990) pointed out, while some soil features can be renewed by natural processes within lifetime scales, other significant properties such as organic matter content and distribution, texture and clay mineral differentiation, total depth of the topsoil and whole soil profile among others, cannot be renewed by natural processes if they are degraded by human activity. Moreover, some types of soils have already become extinct due to unsustainable management practices (Global Soil Forum, 2015). In addition, if badly managed, soils can create negative impacts or “disservices”, such as greenhouse emissions, biodiversity loss, pollution of water bodies, dust storms and erosion (Peake & Robb, 2021; Pereira et al., 2018).

In 2015 the Food and Agriculture Organization of the United Nations (FAO) and the Intergovernmental Technical Panel on Soils (ITPS) published the first global assessment on soils that emphasises a central message:

“[w]hile there is cause for optimism in some regions, the majority of the world’s soil resources are in only fair, poor or very poor condition. Today, 33 per cent of land is moderately to highly degraded due to the erosion, salinization, compaction, acidification and chemical pollution of soils. Further loss of productive soils would severely damage food production and food security, amplify food-price volatility, and potentially plunge millions of people into hunger and poverty” (FAO & ITPS, 2015, p. XIX).

Against a background of sustained rates of degradation, the protection of soils becomes a matter of social and ecological justice. From an anthropocentric perspective, soils are central to the sustainable development paradigm (Bouma et al., 2019). The classical definition of sustainable development rests on the

principles of intra- and inter-generational equity, referring to it as a “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Brundtland & Khalid, 1987, p. 43). However, in a forecast scenario of 9.3 billion people by 2050 and exploitation of non-renewable natural resources at current rates, it is unlikely that future generations will find the means to meet their needs. Without a significant change in attitudes and consumption patterns, for example, crop production will have to increase by 50 per cent in 25 years’ time (Hunter et al., 2017; Monbiot, 2022).

From an ecological perspective, soils are living entities that have a right to “thrive, flourish, and be protected”, and therefore, practices that degrade, pollute and deplete them are morally and ethically wrong, and therefore, regulatory frameworks are necessary to prevent such wrongdoings (Lal, 2019, p. 81A). This entails recognising that soils are more than just a natural resource, they are “harmable” ecosystems, and it is the interruption of their life project that constitutes an injustice (Celermajer & O’Brien, 2020). The lack of visibility or difficulty in detecting many soil problems (Bouma & McBratney, 2013) enables the perpetuation of slow violence of continued over-exploitation, which, following Nixon’s (2011, p. 2) thesis, “occurs gradually and out of sight, a violence of delayed destruction that is dispersed across time and space, an attritional violence that is typically not viewed as violence at all”.

Overall, human-induced soil degradation poses an increasingly neglected barrier for social and ecological sustainable futures as it endangers soils vitality and integrity, as well as human well-being through its impacts on food security, water security, climate change, energy sustainability, ecosystem service delivery and biodiversity (Kibblewhite & Gregor, 2021). However, soils remain overlooked in policy in most parts of the world (Bouma & McBratney, 2013; Ginzky et al., 2017). Moreover, along with unsustainable agricultural practices, this policy neglect amplifies the pressure on soils (Clarke et al., 2002). There is an urgent need to raise awareness about soils because, as Monbiot (2022) puts it, the common notion “that this complex and scarcely understood system can withstand all we throw at it and continue to support us could be the most dangerous of all our beliefs”.

In synthesis, there are several ecological, social and ethical reasons to demand explicit and coherent soil protection policies if we aim to continue operating within a “safe space” (Kopittke et al., 2021). Rates of soil degradation are exceeding those of natural soil formation (in the past 150 years, half of the Earth’s topsoil has been lost). The capability of soils is becoming increasingly impaired to continue providing essential ecosystem services worldwide while securing society’s needs for food, biomass, fibre and other uses. Improved management is required to ensure intergenerational equity, a central tenet of sustainability and to achieve the Sustainable Development Goals (SDGs). Soils are living ecosystems that have been historically subject to diverse forms of slow violence that are frequently imperceptible, but they have a right to flourish and thus be protected.

There remains room for optimism if political decisions are made to avoid further loss of soils and, where possible, rehabilitation of degraded soils (that can vary from easy to very hard). To do so, governments must commit to ensuring that soils are used sustainably, and that management practices do not put at risk their integrity and vitality, promoting ethics of care and respect for the biophysical world to which we are inexorably interconnected (Puig de la Bellacasa, 2015; Tronto, 1993).

1.1 Research purpose

Despite being the primary element on which all forms of terrestrial life depend, soils are “nearly forgotten” in the political domain and remain almost imperceptible to increasingly urbanised societies. Motivated by the low priority attributed to soils in the policy arena and the lack of policies that place soil as a priority (soil depoliticisation), this dissertation seeks to explore the social construction of soil degradation as a public problem and its connection to the process of agenda setting as the initial steps to introduce soil protection into the policy process. The purpose is to contribute to making the political nature of soils visible and the necessity to bring them into the policy arena to discuss pathways to protect their sustainability and maintain their vital functions and processes. To that end, the overarching aim of this dissertation is to explore how soils framings

create de/politicising effects and what are the outcomes of these framings for agenda setting and policymaking, and thus, for the governance of human-soils relationships. By identifying convergences and divergences in problem framings, I expect to provide suggestions to improve policy awareness to enhance soil governance.

The premise of this research is that soil degradation is reaching critical thresholds, promoting a need to find pathways to overcome current blockages impeding soils issues moving from the systemic agenda into the institutional agenda of governments. Focusing on actors' social constructions of the problem may serve as a way to understand why soils are being neglected in policy, as well as explore strategies to "reframe" soils in the policy arena.

Some may object to singling out soils as inefficient to mainstreaming systemic thinking in natural resource governance. However, two important observations can be made in this regard: first, a systemic perspective does not necessarily imply the annulment of the relevance of their independent parts. As Bell (2017, p. 278) argues, "we can recognize the systemic character of the environment without denying that the parts have independent moral significance". And therefore, the second observation is grounded in an ecological justice perspective that understands soils as living ecosystems that have been historically exploited without accountability for the damages caused. Consequently, there is a strong case for dedicated models of soils governance that encompass their protection to stop and reverse harmful practices.

1.2 Research design: introduction to the theory, conceptual framework and methodological approach

The research focuses on understanding the role of framings in the de/politicisation of soils, or in other words, in their inclusion or exclusion from the policy domain. The literature indicates that a public problem becomes a policy problem when it is seen as caused by human actions and amenable to human intervention (Stone, 1989). However, not all anthropogenic environmental problems turn into policy problems or become subjects of the process of policymaking. Problem framings are

crucial to the potential transition from a non-political matter that sits outside policy and decision making to a political one that is actively addressed in the policy arena. Therefore, they serve to explore how in the initial stages of the policy process (i.e., problem definition and agenda setting), a certain vision of a social-ecological order can eventually become implemented (or disregarded) (Peters, 2015; Saurugger, 2016; Stone, 1988, 1989). In the field of policy analysis, framing involves a process of intersubjective sense-making of complex problems in which actors use prior knowledge to understand a particular problem situation and envision what could happen next (Rein & Schön, 1977; Van Hulst & Yanow, 2016). A central assumption in framing theory is that actors attribute different meanings to things in the course of sense-making of a situation, and thus a problem can be interpreted in disparate ways by diverse groups of people (Chong & Druckman, 2007). As Van Hulst and Yanow (2016, p. 99) explain, different interpretations “entail different problem definitions and different solutions, which arise as various actors select various elements from a situation for attention and name and categorize similar ones differently”. Hence, through rhetorical devices of selecting, naming and storytelling, actors strategically mobilise framings in the contentious debate about an issue, either seeking to create awareness and promote policy change or to sustain the status quo and prevent change from happening.

I have selected the science-policy interface as a research boundary because these two communities (i.e., experts and policymakers) have a fundamental responsibility to create awareness about soil degradation – a problem almost invisible to the public, disconnected from what soil is and does for sustaining life. Therefore, how experts and policymakers envision human-soils relationships matters because the alignments or disputes amongst their interpretations shape preferences and influence policy choices (Meadowcroft & Fiorino, 2017).

Building on a material constructivist ontology that recognises realities as shaped by society and culture but limited by nature (Arias-Maldonado, 2011, 2019) and a constructivist/interpretive epistemology through which we capture these environments, this dissertation uses framing analysis to understand the persistent challenge to put soils on the institutional agenda, which impacts in their

governance and overall status. However, due to the lack of specific criteria to guide the analysis and examine what is being purposefully selected and narrated, the thesis develops a heuristic device for the critical inquiry of soils framings: the Politics of Framing Framework (PoFF), which combines approaches from political and social sciences, political ecology, and environmental humanities. The PoFF aims to serve as an organising principle in the analysis of framings through the exploration of three dimensions: ontological politics, power, and justice. The premise is that by unpacking how these dimensions operate in soils framings, we will be in a better position to understand which political ontologies of human-soils relationships are being actualised in reality and which are being silenced, how power is mobilised in those framings and what notions of justice are implied for guiding action. Furthermore, the articulation of these dimensions will help us understand how de/politicisation comes to be. It should be noted that although this research was inspired by policy analysis and policy process studies, as part of a doctoral program in sustainable futures that encourages inter- and trans-disciplinary research, it adopts a creative approach in lieu of traditional disciplinary analysis of politics and policy dynamics.

Two cases have been selected to explore the role of soils framings in agenda setting and policymaking, New South Wales, Australia and Uruguay. The rationale for choosing these cases is justified in the diverse trajectories that soils have had in each policy arena, leading to different outcomes in their governance and protection. The case study is used in this research as an approach to exploring complex issues occurring in a bounded setting (Miles & Huberman, 1994). Since it enables an in-depth understanding of phenomena in their real-world contexts (Yin, 2009), it is suitable for the aims pursued in this study by seeking to understand how framings might advance or block the cause of soil protection from the institutional agenda of governments. In NSW, an attempt to introduce a new soils policy in 2011 (NSW policy Looking Forward, Acting Now) failed, preserving a fragmented soils governance, with policies and regulations scattered across agencies, strategies and legislation (Webb et al., 2015). Whereas in Uruguay, a series of policy developments in the soil space in the past years, particularly the

Soil Use and Management Plans (SUMPs), have rendered the country one of the few “global standard bearer[s] of soil governance” (Peake & Robb, 2022). The research was informed by qualitative data from 26, semi-structured, in-depth interviews with experts, policy entrepreneurs and policymakers (16 participants from NSW and 10 from Uruguay), as well as key policy documents. The selection of participants was based on their relevance to answering the research questions, and the documents were selected based on additional information they provided to enrich descriptions.

Finally, it is worth noting that this dissertation does not cover non-western perspectives in soil management and stewardship because they are not considered in the policies analysed in this work. However, in acknowledging their critical relevance to enhance soil governance, such perspectives are examined in some parts of the analysis, particularly in the Australian case (Chapters 5 and 6), to highlight how their exclusion from mainstream policymaking contributes to current soil depoliticising strategies.

1.3 Research questions

The research questions and objectives guiding this research emerged from the literature review and evolved as the fieldwork unfolded. This dissertation investigates how framings operate in soils de/politicisation and their impacts in terms of agenda setting and policymaking through an exploration of the following questions:

RQ1: How has the problem of soil degradation been framed in the past in New South Wales? Supported by these sub-questions: How were those framings created? What soils political ontologies are embedded in these framings, and how do they relate to the deployment of de/politicising strategies by experts and policymakers? What potential order of human-soils relationships sought to be actualised in the policy proposal *Looking Forward, Acting Now*? How does this political ontology account for the policy outcome?

RQ2: *How is the problem of soil degradation currently being framed in New South Wales' policy arena?* Supported by the following sub-questions: What is the current dominant soil framing, and which ideologies underpin it? To which interests does it conform? Who holds and circulates relevant information about the status of soil resources within the government and outside of it?

RQ3: How can soil degradation be reframed to secure sustainable and just soil futures following Uruguay's recent soil policy developments? Supported by a set of sub-questions: Where is placed the responsibility for caring about the integrity and vitality of soils? What is recognised as the subject of policy, and how? Who speaks for soils, and how are they represented in the policy arena?

Using the PoFF, the objectives of this dissertation are to investigate (i) how the three dimensions embedded in framings operate in the social construction of soils as a public policy problem in two jurisdictions, New South Wales, Australia and Uruguay, (ii) their connection to processes of soils de/politicisation, and (iii) the outcomes in terms of agenda setting and policymaking for soils. With that aim, each chapter dedicated to empirical analysis (Chapters 5, 6 and 7) will address one of the three main research questions guiding this research by delving in-depth into one of these dimensions. In addition, the questions have been constructed chronologically to explore the contingent nature of problem definition and agenda setting.

1.4 Thesis structure

This thesis is organised in nine chapters through which the line of argument is developed by connecting the emergent themes from the literature review with the research design, conceptual framework, selection of cases, and analysis of empirical data. In what follows, I outline the contents of each chapter.

Chapter 1 provides an overview of the research. It situates the research problem, presents the purposes and aims, and introduces the theory, conceptual

framework, methodological approach, and research questions that structure this investigation.

Chapter 2 presents a review of literature that explains a “soil story” through the exploration of three challenges. First, it addresses the social-ecological challenge of human-induced soil degradation and the risks of depleting soils vital functions and processes. Then it presents the global governance challenge, which reveals the low priority of soils in the international agenda despite the development of recent initiatives. Finally, it introduces the public policy challenge that explores the reasons for soil neglect in public policy theoretically by delving into agenda setting and problem definition theories.

Chapter 3 introduces a published journal article that explores the role of framings, particularly that of soil security, in politicising soil problems to potentially introduce them into the policy agenda. To do so, it introduces the failed attempt to re-politicise soils in 2011 with the proposal Looking Forward Acting Now and discusses if it might have benefited from using this particular framing.

Chapter 4 sketches the research design and methodological approach. The chapter is divided into two parts. The first part introduces the conceptual framework (the PoFF) developed to analyse empirical data and explains the reasons underlying its creation. The second part describes the methodology, research methods and case studies used to analyse the soils framings at the science-policy interface. Subsequently, it outlines the coding process for interviews and secondary data and the challenges faced during the fieldwork and analytical process.

Chapter 5 is divided into two parts. The first part analyses the trajectory of soils since they entered NSW’s policy arena and became a policy problem with the passing of the Soil Conservation Act in 1938. The objective is to problematise (Bacchi, 2012; Foucault, 2019) how soils have been addressed by the state across time and identify how shifts in thinking about human-soils relationships have been accompanied by de/politicising strategies in the policy arena (Buller et al., 2019; Hay, 2007; Jenkins, 2011). Furthermore, this chapter analyses the soil policy proposal of 2011 by delving into the political ontology embedded in the policy

framing. Contextualising the evolution of soil's *political ontologies* assists us in understanding how soils became depoliticised in NSW.

Chapter 6 explores how *power* is currently shaping the fragmented governance landscape of soil resources in NSW. The results explain how the embedded ideologies, interests and information (Jones & Baumgartner, 2005; Weiss, 1983) of dominant discourses in the public sector operate by excluding soils from the policy agenda (Bachrach & Baratz, 1962; Lukes, 2005). This chapter analyses the divergences in framings among policymakers and experts. While the former legitimise the status quo perpetuating soils depoliticisation, the latter claim for new policies that address current soil problems in the state.

Chapter 7 delves into the justice dimension of the PoFF by analysing the Uruguayan soils conservation policy through the operationalisation of the three key categories related to ecological justice (Schlosberg, 2007, 2012, 2014): responsibility, recognition and representation. This chapter explains how soils re/politicisation rest on a commitment to amplifying the domain of politics and putting into question their over-exploitation without any care or accountability.

Chapter 8 synthesises and amalgamates the results from the empirical chapters. First, it presents the key findings. Then it focuses on discussing the PoFF and how has it worked as a critical and heuristic tool of analysis and brings the three dimensions together to find their interrelations. Finally, it reflects on how each of the dimensions contained in the framework converse by articulating the findings of Chapters 5, 6 and 7.

Chapter 9 presents the conclusions of this dissertation. It revisits the research questions and addresses the limitations, contributions, and suggestions for further research.

Chapter 2

A soil story told through three challenges

This review of literature is structured in three parts, with the aim of gradually depicting and navigating a soil “story” that underpins and provides the rationale for this dissertation. First, I refer to the *social-ecological challenge* of human-induced soil degradation. This section introduces the importance of soil from a social-ecological perspective, highlighting the critical role of soil functions and processes to ecosystem services and human wellbeing. Then the concept of soil degradation and its diverse global assessments is presented, revealing that we are facing a perilous situation that is pushing four out of the nine planetary boundaries into a high-risk zone, endangering soil’s capacity to provide ecosystem services. The second section explores the *global governance challenge*, which demonstrates that historically, the soil has been a low-priority natural resource on the agenda and that despite the recent emergence of global initiatives, there is still no legally binding instrument for soil protection and the supporting international architecture remains rather weak. In the third section, I present the *public policy challenge* that seeks to theoretically explore reasons for soil neglect in public policy. I draw on a constructivist/interpretive approach to understand how public problems turn into policy problems which entail the study of agenda setting and problem definition. This will underpin the conceptual framework developed for

this dissertation that will be introduced in Chapter 4 and operationalised in Chapters 5, 6 and 7.

2.1 The social-ecological challenge

The soil is the primary element on which all forms of terrestrial life depend, and yet it is almost imperceptible to the public and “nearly forgotten” in the policy arena despite its ongoing degradation. We are profoundly interconnected to soils in numerous visible and invisible ways. Our most tangible connection is through food production – 98.8 per cent of global food comes from the soil (Kopittke et al., 2021). Soils also support plants, provide a platform for human activities and are an integral element of landscapes. Intangible connections include the physical and chemical processes performed by soils, such as the regulation of greenhouse gases (CO₂, CH₄, and N₂O), buffering and moderation of the hydrological cycle¹, retention and delivery of nutrients to plants, decomposition of organic matter and wastes, renewal of soil fertility, and host for a diverse gene pool, amongst others.

The soil is rather different from other natural resources, such as water and air, to which we require direct access and contact in our daily lives. However, societies depend today more than ever before on this “silent ally”, as we cannot eat, breathe, drink, or stay healthy without the “services” provided by the soil (Wall & Six, 2015). Meanwhile, soil health continues to decline every year, and as the Sustainable Soil Alliance (2018) claims, “to the extent that we are now just one generation away from a soil system that is unable to meet the needs of the people that depend upon it”.

Soil degradation is a phenomenon that affects almost every country in the world at rates that cannot be sustained (Clarke et al., 2002; FAO & ITPS, 2015; Oldeman, 1992; Pimentel, 2006; Prager, 2010; Weigelt et al., 2015). Although soils are not only subject to human degradation (i.e., natural forces also exert their influence), all soils are affected to some extent by human action. Albeit the

¹ Soils store 65% of global freshwater and provide 90% of the water used in global agricultural production (Laban et al., 2018).

anthropogenic pressure is not always obvious, certain human activities have direct impacts, such as land-use change, land management and land degradation, whereas indirect impacts include, for example, acid deposition (sulphur and nitrogen) and heavy metal pollution (Smith et al., 2016).

In this section, I will address the role of soils² through a social-ecological lens linking soil systems to human systems and how from that interconnection in which humanity greatly benefits from soil services, in return, the soil is impaired. Recent reports from international organisations (FAO et al., 2020; FAO & ITPS, 2015; IPCC, 2019; Scholes et al., 2018) recount the critical situation of soils, yet awareness at both global and national scales do not seem to follow the ecological urgency.

2.1.1 Human life and soil liveliness: interdependent natures

The soil, pejoratively labelled as “dirt” or “dead matter”, is one of the most important natural resources on Earth, critical for the Earth system (Bockheim & Gennadiyev, 2010), ecosystem services (Baveye et al., 2016; MEA, 2005), and system maintenance within planetary boundaries³ (Rockström et al., 2009; Steffen et al., 2015). In simple terms, the soil is defined as “the upper layer of the Earth’s crust transformed by weathering and physical/chemical and biological processes. It is composed of mineral particles, organic matter, water, air and living organisms organized in genetic soil horizons” (FAO & ITPS, 2015). It is the interface linking vital geologic, atmospheric, hydrologic, and biological processes at Earth’s surface.

² In this dissertation, whenever possible, I will use the term “soils” instead of the singular “soil”. Beyond the fact that in biophysical terms, there is no such thing as a homogeneous “soil”, I concur with Krzywoszynska and Marchesi (2020) that by using the plural form, we express a commitment to emphasise “the diversity of soil materialities”.

³ Although soils are not directly addressed in the Planetary Boundaries Framework – limits to human disturbance on critical Earth-system processes to remain in a “safe operating space” (Steffen et al., 2015) – they are a key element (directly or indirectly) to five of the nine boundaries: climate change, loss of biosphere integrity (biodiversity loss and extinctions), biogeochemical flows to the biosphere and oceans (nitrogen and phosphorus cycles), land system change, and freshwater consumption and the global hydrological cycle. To some scholars, this omission contributes to the invisibility of soils. For example, Davies (2017, p. 310) contends that “Soils are buried in the scientific frameworks, such as ‘planetary boundaries’ (...). Scientists know that soils are central to nitrogen and phosphorus flows, the integrity of the biosphere, and changes to the climate and land system. But without naming a limit for soil loss or degradation that humanity must live within, the issue is easily overlooked”. Kopittke and colleagues (2021) have quantified soils’ contribution to the five planetary boundaries mentioned above, evidencing their intrinsic connection.

As has been put by Amundson and colleagues (2015, p. 648), the soil is the “living epidermis of the planet”.

Although the concepts of “soil” and “land” are often used interchangeably, these terms have quite distinct meanings to different epistemic communities. Land is a more complex term than soil. According to the FAO (1995, p. 6), land is:

“[A] delineable area of the earth’s terrestrial surface, encompassing all attributes of the biosphere immediately above or below this surface including those of the near-surface climate the soil and terrain forms, the surface hydrology (including shallow lakes, rivers, marshes, and swamps), the near-surface sedimentary layers and associated groundwater reserve, the plant and animal populations, the human settlement pattern and physical results of past and present human activity (terracing, water storage or drainage structures, roads, buildings, etc.)”.

However, soil scientists Bouma and McBratney (2013) explain that although the soil is functionally characterised as part of the land (especially in environmental modelling studies), it has a unique role as it is the permanent and relatively stable element at the surface of the earth – “a specific point of reference” if compared to climate, hydrology, biodiversity and energy that change with time.

Humans have been intervening in natural soils since the transition from hunting and gathering to the adoption of agriculture and construction some 10,000 years ago. Fromherz (2012, p. 60) asserts that the story of humanity is the story of soil because “[a]s we unlocked the secrets of agriculture, we were able to build grand civilizations”. Moreover, he argues that due to the surplus of food, humans had the time to pursue other endeavours, such as the arts, science, medicine, philosophy, and sophisticated forms of government. The effects of the influence of humans on the soil over the Holocene include a wide variety of agricultural impacts; construction of villages, cities, and roads; levelling and terracing; irrigation and drainage; mining; compaction and erosion (Richter & Tugel, 2012).

Therefore, the process of “domestication” of the soil, particularly with the expansion of agriculture, has modified soil structure by the removal of native flora, the simplification of biodiversity in support of monoculture, and the physical

disruption of the soil (Amundson et al., 2015). These disturbances to soils through farming practices have altered chemical (e.g., soil carbon loss), physical (e.g., loss of structure) and biological conditions (e.g., deficiencies in nutrient availability). As a result of the transformation of soils into human-natural systems, “soil fluxes of energy, gases, water, solutes, and solids with the atmosphere, hydrosphere, lithosphere, and biosphere are altered in ways difficult to predict” (Richter et al., 2015, p. 8). Furthermore, the significant effects of the human force on the Earth system have drastically accelerated since the mid of 20th century (Waters et al., 2016), and today “more than half of the Earth’s 13 billion ha of soils are ploughed, pastured, fertilized, limed, irrigated, drained, fumigated, bulldozed, puddled, compacted, eroded, leached, mined, reconstructed, or converted to new uses” (Richter & Tugel, 2012, p. 1372).

Unsustainable soil management practices are depleting soil resources at rates much higher than those of soil formation. A mere inch of topsoil can take centuries to build⁴, yet, if it is unsustainably managed, it can be destroyed very quickly in just a few seasons (European Commission, 2006b; Wall & Six, 2015). As various scholars observe, land use and management affect soil properties on timescales that can vary from minutes to hundreds of years (Richter, 2007; Sparling, 2006). Contrary to common belief, soils are not inert but lively matter whose renewal depends on “the movement of living things and decaying remains of that life” (Ferguson & Northern Rivers Landed Histories Research Group, 2016, p. 957). Since they provide the bio-infrastructure that enables everyday life (Puig de la Bellacasa, 2014), human life and soil liveliness are inexorably enmeshed, as will be further explained in the following subsection.

In a nutshell, civilizations have greatly benefited from the soil at the expense of its exhaustion, the loss of productivity, and the capacity to perform critical

⁴ Rates of soil formation vary depending on several factors such as parent material, climate, presence of water, topography, presence of organisms -including humans- and so forth. Thus, scholars use different time references, often varying between 200 years (e.g., Daily et al., 1997) to 1000 years (e.g., Wall & Six, 2015).

geochemical processes for life⁵. As Daily and colleagues (1997, p. 115) assert, humans cannot drastically accelerate the process of soil formation, “the world’s rich, agricultural soils ‘underlying the world’s ‘breadbaskets’ today were born in remote periods of human history; they represent an inheritance of natural capital, upon whose bequest future generations depend”.

2.1.2 Soils vital functions and processes

Soils are complex ecosystems. The many interactions among their diverse living entities and components (e.g., minerals and organic matter) produce complex biological, chemical, and physical processes (Laban et al., 2018). The critical functions and processes performed by soils are vital for providing ecosystem services and, thus, for human wellbeing. Soils functions began as an object of study by soil scientists in the 60s, but it was Blum’s (1988) classification of five soils functions⁶ that became increasingly popular in policymaking circles, particularly in Europe, where it was used to create legislation (e.g., Germany and England) (Baveye et al., 2016). Moreover, this classification served as an inspiration to the European Commission’s “Soil Directive Framework” (2006a), which determined the protection of seven soil functions:

1. Biomass production, including agriculture and forestry
2. Storing, filtering and transforming nutrients, substances and water
3. Biodiversity pool, such as habitats, species and genes
4. Physical and cultural environment for humans and human activities
5. Source of raw materials
6. Acting as a pool of organic carbon
7. Archive of geological and archaeological heritage.

⁵ It should be noted that traces of positive anthropogenic impacts on soils have been found, for example, in the Amazon with the discovery of “terra preta” (black earth). These soils were created (intentionally or unintentionally) by pre-Columbian communities that enriched infertile soils through the combination of organic and inorganic materials (e.g., charcoal, fish and animal bones, manure and biochar) and have raised interest due to their capacity to enhance ecosystems and long-term carbon sequestration (Comberti et al., 2015; Glaser & Birk, 2012).

⁶ Soils functions were grouped as: socio-economic (supply of water and raw materials), technical-industrial (landscaping and engineering medium) and ecological (biomass production and plant growth support; filter of chemical and biological contaminants; preservation of genetic diversity).

The functions performed by the soil are critical for the delivery of ecosystem services. The ecosystem services (ES) framework gained traction after the seminal works of Costanza et al. (1997), Daily (1997), De Groot et al. (2002) and the publication of the Millennium Ecosystem Assessment (MEA, 2005)⁷ and The Economics of Ecosystems and Biodiversity (TEEB, 2009). The ES concept aimed to raise awareness about the importance of identifying and incorporating nature's services in policymaking, bridging the scientific-economic-policymaking divide (Robinson et al., 2009, p. 1904). More specifically, it promotes the sustainable management of resources by articulating ecological, economic and social aspects, emphasising the value of natural systems for humans (Grêt-Regamey et al., 2017). Daily (1997, p. 3) defines ecosystem services as “the conditions and processes through which natural ecosystems, and the species that make them up, sustain and fulfil human life”. In simple terms, ecosystem services refer to the benefits humans obtain from the resources and processes of ecosystems. This framework reconnects humans and nature, postulating that “people are integral parts of ecosystems and that a dynamic interaction exists between them and other parts of ecosystems, with the changing human condition driving, both directly and indirectly, changes in ecosystems and thereby causing changes in human well-being” (MEA, 2005, p. v).

The generic ES framework has become prominent amongst soil scholars in recent years since it has proven useful for bringing attention to soil services (listed in Table 2.1) in the scientific literature and media as the soil is a critical contributor in their delivery, from support, regulation, and provision, to cultural services (Baveye et al., 2016; MEA, 2005; Otte et al., 2012). Soils ecosystem services are fundamental to the sustainability of natural and managed terrestrial systems, underpinning vital physical and chemical processes for all life forms (Jónsson & Davíðsdóttir, 2016). The ES framework applied to soils (Breure et al., 2012; Dominati et al., 2010; Robinson et al., 2012, 2014) seeks to convey the importance

⁷ Baveye and colleagues (2016) observe that early attempts to value nature's services started in the 60s, prompted by the emergence of the “ecosystem functions” concept (Odum, 1959) and followed by other similar elaborations such as “environmental amenities” (Adamowicz, 1991) or “environmental goods and services” (Vatn & Bromley, 1994).

of soil functions to decision makers and the wider public⁸ (Robinson et al., 2014, p. 686). Moreover, to this perspective, human practices are intrinsically linked to the maintenance and/or enhancement of soil ecosystem services (Pereira et al., 2018). The primary assumption of this framework is that as people become aware of what they obtain from ecosystems, in turn, they will choose to conserve natural capital, “thereby leading to better protection of the natural world” (Robinson et al., 2017, p. 3).

Two key references in the study of soil ES are Dominati et al. (2010), whose approach is shown in Figure 2.1, and Robinson et al. (2012). Both works highlight the importance of linking the natural capital of soils for delivering ES. The natural capital of soils refers to soil stocks (the standard soil properties⁹) that, through their processes, yield the flow of valuable ecosystem services (Costanza & Daly, 1992). It includes the biological (micro and macro living organisms)¹⁰, physical (e.g., minerals, temperature, depth), and chemical properties (e.g., pH, organic carbon and electrical conductivity) of specific soil types under specific land uses (McBratney et al., 2017). Therefore, the natural capital of soil (the measurable and assessable soil properties) impacts the quality and quantity of soil services¹¹.

⁸ Similar attempts have been made to draw attention and policy action towards landscapes (e.g., Termorshuizen & Opdam, 2009).

⁹ Soil properties can be *inherent* or *manageable* (Dominati et al., 2010) or *inherent* or *dynamic* (Robinson et al., 2012). Inherent refers to more permanent conditions (e.g., soil texture, mineralogy, clay type), while manageable or dynamic properties respond to active management (e.g., organic matter, soil moisture). The inherent properties are used to analyse soil capability, and the manageable or dynamic properties are used to examine soil quality and health (Samarasinghe et al., 2013).

¹⁰ Soils’ rich web of life includes microorganisms such as fungi and bacteria; microfauna such as protozoa and nematodes; mesofauna like springtails and mites; and macrofauna and megafauna such as ants, termites, and earthworms, amongst others (FAO et al., 2020).

¹¹ The natural capital (NC) concept has been the cornerstone of the weak vs strong sustainability debate within neoclassical economics but later permeated other disciplines (e.g., ecological economics, environmental science). To the former, NC and human-made capital can be substituted for one another because human well-being generally does not depend on any specific type of capital, whereas to the latter, they are complementary. In other words, in the weak sustainability paradigm, NC can be depleted as it can be compensated by manufactured capital (e.g., infrastructure), while in strong sustainability, the stock of NC is irreplaceable and should be maintained over time (Ang & Van Passel, 2012; Chiesura & De Groot, 2003; Ekins et al., 2003). Against this polarised debate, the concept of “critical natural capital” (CNC) surfaced to emphasise that there is a subset of the NC that cannot be replaced or substituted because it delivers vital environmental functions or services (e.g., soil fertility, climate regulation). Thus, CNC characterises

Table 2. 1 Soil Ecosystem Services

Categories	Functions/Services
Support	Soil formation Primary production Nutrient cycling Maintenance of genetic diversity
Regulation	Water regulation Water supply Nutrient regulation Climate regulation Gas regulation Air quality regulation Waste recycling Biological control Disturbance prevention
Provisioning	Food Raw materials Genetic resources Medicinal resources Fresh water
Cultural	Recreation and tourism Aesthetic information Spiritual and historic information Science and education

Nevertheless, as Breure and colleagues (2012, p. 578) state, despite soils being critical suppliers of ES, “soil services are often not recognised and generally not well understood, nor is the link between soil natural capital and these services”. Overall, even in the ES framework, soils are still “overlooked”, and there is no agreement on a framework for identifying, classifying and valuing them (Dominati et al., 2010; Jónsson & Davídsdóttir, 2016). Furthermore, this approach, which highlights the importance of measuring the contributions of ecosystems to

“the part of the natural environment that ought to be maintained in any circumstances in favour of present and future generations” (Brand, 2009, p. 606).

societies¹², is highly contested. Many aspects of the ES concept have been questioned, such as the economic valuation of nature (Cornell, 2011; McCauley, 2006; Redford & Adams, 2009; Toman, 1998) that could lead to its commodification (Ernstson & Sörlin, 2013; Kosoy & Corbera, 2010; Turnhout et al., 2013); its anthropocentric focus on underpinning instrumental values and extractive relationship with nature (Fairhead et al., 2012; Raymond et al., 2013; Robertson, 2012); the unidirectional flow of ecosystem services to humans overlooking reciprocal relationships (Comberti et al., 2015)¹³; and difficulties in engaging with diverse perspectives and knowledge, particularly the social sciences and humanities, local practitioners and indigenous people (Chan et al., 2012; Díaz et al., 2018)¹⁴. In trying to overcome some of these shortcomings, in 2017, IPBES introduced a novel term, “Nature’s Contributions to People” (NCP), which refers to “all the contributions, both positive and negative, of living nature (diversity of organisms, ecosystems, and their associated ecological and evolutionary processes) to people’s quality of life” (Díaz et al., 2018, p. 270). The NCP seeks to provide more legitimate results for policy and practice by including diverse knowledge systems. Nevertheless, Kadykalo et al. (2019) argue that there is still confusion over the two terms. In their view, although the shift from “services” to “contributions” and from “wellbeing” to “quality of life” might carry different connotations, “they are built on similar grounds” (2019, p. 270). It should be noted that in the context of this dissertation, I make use of both concepts as metaphors that serve as a plea for soil protection because, beyond these ongoing debates, they shed light on the many functions performed by soils, which become available to us as “services” or “contributions”.

¹² Scholars have pointed out that soils were overlooked in the classification of ecosystem types for economic evaluation in The Economics of Ecosystems Biodiversity (TEEB) framework (Pereira et al., 2018, p. 8). Nevertheless, attempts have been made to measure the value of soils contributions to ecosystem services in the past years. For example, building on the work of Costanza et al. (1997), McBratney, Morgan and Jarrett (2017) estimated the annual (minimum) value of the world’s soils ecosystem services at 11.38 trillion USD (based on USD 2015 values).

¹³ The authors propose the “Services to Ecosystems” (S2E) concept to highlight people’s contribution to the maintenance and enhancement of ES.

¹⁴ A more detailed systematisation of critiques is provided by, for example, Gómez-Baggethun and Ruiz-Pérez (2011) and Schröter et al. (2014).

Furthermore, the social-ecological systems approach indicates that we should direct attention to the relationship between nature and society by analysing the contribution of ecosystems to human well-being and/or how social dynamics affect the integrity of ecosystems (Berrouet et al., 2018). According to Martín-López and Montes (2015, p. 600), adopting this framework means recognising not only that human well-being depends to a certain extent on ecosystems but also that the conservation of ecosystems depends on human behaviour and governance arrangements and processes.

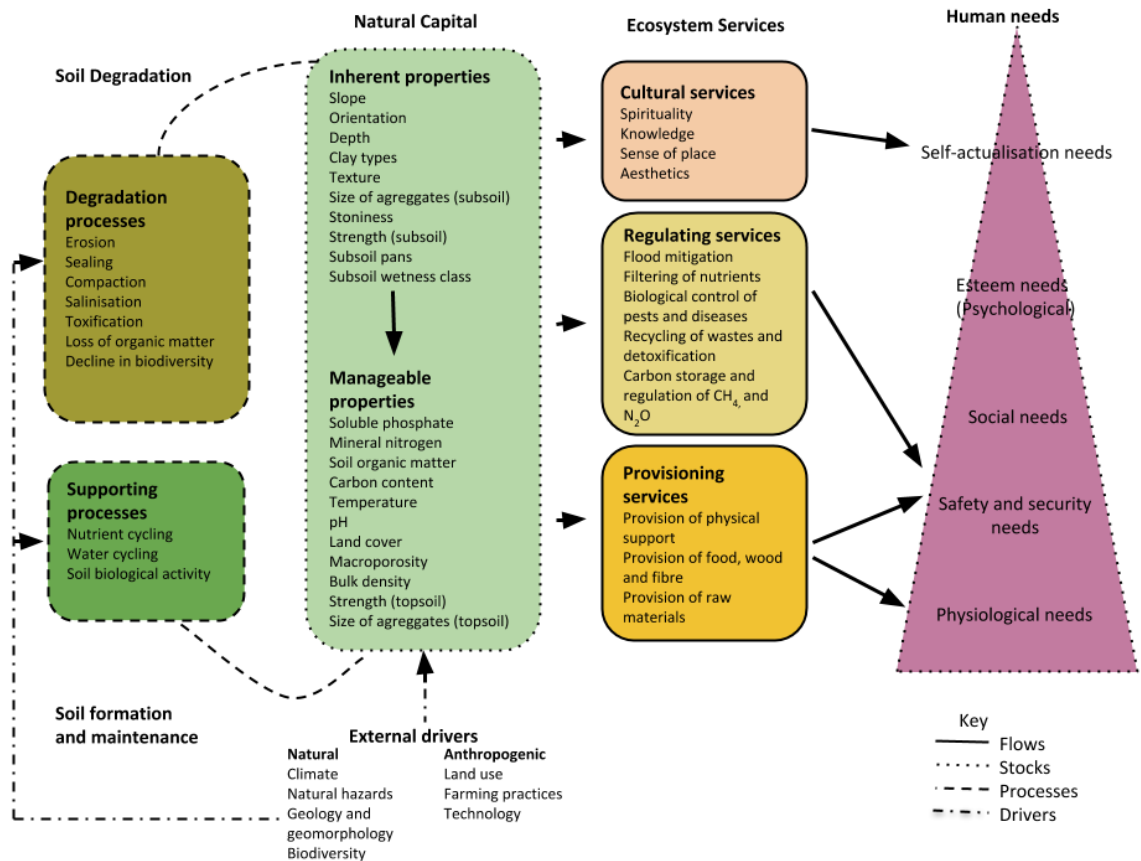


Figure 2. 1 Framework for the provision of ecosystem services from soil natural capital.

Source: Adapted from Dominati et al., 2010.

According to McBratney, Field and Jarrett (2017), the soil can be conceptualised in three ways: in terms of its biophysical attributes, as an object of scientific study, and in societal terms (i.e., valuing and caring for soil for the benefit of humanity). My research will focus on the third concept, which includes the notion of soil

protection¹⁵. The concept of soil protection emerged from the European Commission's 6th Environmental Action Programme in 2001 (Breure et al., 2008; McBratney, Field, & Jarrett, 2017), which presented a specific strategy for the protection of soils based on the principles of preservation of soil functions, prevention of further degradation, mitigation of effects, as well as restoration of degraded soils. Moreover, the strategy introduced the concept of "soil threats", namely: contamination, erosion, organic matter decline, salinisation, compaction and landslides.

Although commonly used, there are few explicit definitions of soil protection in literature. In an analysis of the international soil law regime, Wyatt (2008, p. 166) makes an important point by arguing that better protection of soils would require a *comprehensive approach* with soil functions "not only better singled out for recognition, but also more fully tied together, highlighting soil law and policy as a focal topic unto itself". In this dissertation, by soil protection, I refer to the institutional arrangements that aim to tackle human-induced threats to soils and coherently maintain and enhance soils functions. Although McBratney and colleagues (2017, p. 107) argue that many of the concepts related to valuing and caring for the soil are "relatively narrow in scope, sometimes vague, and generally focus on biophysical attributes of the soil" compared to that of soil security¹⁶, I opt for the term soil protection as I consider that it can easily resonate with the

¹⁵ The authors identify diverse conceptual developments in this stream of soils study. Early concepts of soil valuing and caring include soil care, land evaluation and capability, and soil conservation, while more recent developments include soil function, soil quality, soil health, soil condition, soil change, soil resilience, soil ecosystem services, soil protection and soil security. Carter (2003, p. 27) outlines that conservation and preservation were two early strands of environmental thinking. Even though both are anthropocentric in focus, he argues that the former was concerned with managing resources to be available for consumption and the latter with preserving resources from consumption.

¹⁶ Soil security (Koch et al., 2012, 2013) is a valuable broad analytical framework that has been gaining attention among soil scholars. It will be addressed in more detail in Chapter 3. For now, I will highlight that the securitising tendencies in the environmental sector that appeal to the effects of language through the rhetoric of security (which many see as "alarmist" and "sensationalist") can be problematic if the associated practices are not well developed and made explicit. Although "soft" approaches to security have proven useful in capturing attention, raising awareness, and invoking political action (Fischhendler & Katz, 2013), once they enter the political space, they might be redefined according to the interests of the groups in power, potentially leading to different outcomes than those initially sought (Gonzalez Lago, 2020).

policymakers and the public while at the same time denotes a clear sense of governmental responsibility. Thus, soil protection provides a more precise articulation of human and soil systems by implying the responsibility of the former in ensuring that the necessary policy instruments (e.g., regulations, incentives and voluntary agreements) are available for the sustainable management of the latter. Furthermore, following the work of scholars in the environmental humanities and social sciences (Krzywoszynska, 2019; Parrique, 2019; Puig de la Bellacasa, 2015, 2017, 2019; Salazar et al., 2020), such responsibility is entrenched in the principle of fair treatment of otherness and an ethics of care¹⁷ (Tronto, 1993) that prioritises integrity, vitality, and conviviality over abuse and exploitation.

2.1.3 Characterising human-induced soil degradation

The concept of degradation¹⁸ is frequently used as an umbrella term for diverse land and soil conditions such as erosion, compaction, sealing, salinisation and desertification (Gibbs & Salmon, 2015). According to Bridges and Oldeman (1999), “[s]oil degradation is defined in terms of human-induced phenomena that *lower the current and/or future capacity of the soil to support life*” [emphasis added]. FAO (2021a) defines soil degradation as “a change in the soil health status resulting in a *diminished capacity of the ecosystem to provide goods and services for its beneficiaries* [emphasis added]. Degraded soils have a health status such that they do not provide the normal goods and services of the particular soil in its ecosystem”. On the other hand, Gibbs and Salmon (2015, p. 13) state that within

¹⁷ In her seminal work “Moral Boundaries: A Political Argument for an Ethic of Care” (1993), Tronto establishes a difference between the concepts of protection and care. In her view, though the former might include activities of care, it can also have other ends. For example, the military can seek to protect its citizens by destroying others. Nevertheless, as she argues, protection as long as it is aimed at “maintaining and continuing our world [...] fits within the definition of care” (1993, p. 104). The approach to soil protection policy that I introduced above is in line with this definition. Therefore, protection cannot be disconnected from an ethics of care to assure that objectives are achieved following these principles. I will explore this topic in more detail in Chapter 7.

¹⁸ Although soil degradation is generally associated with erosion, the term is also used in the jargon of environmental reports to referring to a wide range of soil problems and threats, including water erosion, wind erosion, salinity, acidity or alkalinity, loss of organic matter, soil biodiversity loss, fertility decline, structure decline, mass movement, soil contamination and soil sealing (FAO & ITPS, 2015).

the scientific community, there is “nearly a universal consensus that it can be defined as a *reduction in productivity* [emphasis added] of the land or soil due to human activity”.

It must be noted that the issue of resource values (i.e., environmental ethics) is embedded in the definition of the problem (Jacobs et al., 2016). The approaches to degradation presented above tend to place the emphasis of soils’ value on their utility for humans (instrumental) and not on their inherent worth (intrinsic). In other words, mainstream framings of the problem value *soil for the sake of humans* (consequentialist ethics) rather than *soil for the sake of soil* (deontological ethics). In the field of conservation, ethical constructs are used by scientists and practitioners to support protection policies. While “traditional conservationists” articulate their discourse based on deontological ethics, “new conservationists” (as in the ecosystem services approach) draw on consequentialist ethics. A third category of “relational” values (eudemonic) has been recently introduced in the conservationist debate by Chan and colleagues (2016), seeking to overcome this dualistic thinking¹⁹. In this case, the emphasis is placed on the interconnections between people and ecosystems in tangible and intangible relationships to nature, as well as the principles, virtues and notions of a good life that may accompany these. The relational-value framing recognises that people hold both – instrumental and intrinsic – values but focuses on the quality of the relationships with nature that enliven those values (Chan et al., 2016) and that are non-substitutable (Himes & Muraca, 2018) and reciprocal (Mattijssen et al., 2020). Therefore, to many scholars in the environmental humanities and social sciences, relational values offer a pluralistic approach that is more suitable for underpinning policy and conservation practice (Chan et al., 2018; Himes & Muraca, 2018) by incorporating the “largely intuitive ways that people make decisions, understand the world and decide what is right” (Klain et al., 2017).

¹⁹ Arias-Arévalo et al. (2018) illustrate the three value domains metaphorically as in *gaining from nature* (instrumental), *living for nature* (intrinsic), and *living in nature* (relational).

Whether the problem is framed on the instrumental, intrinsic or relational value of soils, in the context of this dissertation, *human-induced*²⁰ soil degradation results from the interactions between humans and the environment. Thus, it essentially implies a social problem (Blaikie & Brookfield, 1987; Oldeman et al., 1990). Bridges and Oldeman (1999) believed that people would not normally destroy a natural resource on which they depend. Nevertheless, as Fromherz (2012, p. 60) later asserted, instead of raising responsible stewardship, we are, in fact, using and abusing our soils with reckless abandon. Increased population and higher demands for food, fibre, energy and housing put pressure on soils as never before, risking humanity leaving its “safe operating space” and aggravating the loss of intergenerational equity and the integrity of ecosystems (Weigelt et al., 2015).

As stated previously, since early agriculture, human intervention has modified terrestrial ecosystems affecting land cover and the properties of soils (FAO & ITPS, 2015; WBGU, 1994). Land clearing for cropping, overgrazing of grassland, and inappropriate agricultural management are just a few examples of activities that have historically exhausted soils. It has been estimated that until one thousand years ago, crop and pastureland used less than one to two per cent each of the Earth’s ice-free land; by 1700, it had increased to two to four per cent each, and today, almost every fertile area is under cultivation (FAO & ITPS, 2015; Klein Goldewijk et al., 2011).

In 1990, the Global Assessment of Soil Degradation (GLASOD) was commissioned by the United Nations Environment Program (UNEP) to map the status of human-induced soil degradation based on expert knowledge. Though the degradation of soils was and is widely recognised as a critical problem, until GLASOD, little was known about its geographical distribution, total areas affected, and the severity of the problem (Oldeman, 1992). GLASOD identified five main

²⁰ This dissertation focuses on the anthropocentric pressures unleashing these frequently “invisible” and complex processes, aiming to foreground our responsibility towards nature and future generations. Nevertheless, Engel-Di Mauro (2014, p. 165) rightfully claims, “soils degrade regardless of our awareness of that process and even without human intervention”. However, as he also analyses, degradation is a combination of ecological processes that include social ones that dictate, for example, who has access and who can use them recklessly or determine when it is a problem or conceal it.

human factors causing soil degradation (Box 1): deforestation and removal of the natural vegetation, overgrazing, agricultural activities, overexploitation of vegetation for domestic use, and (bio)industrial activities. Even though the GLASOD map (shown in Figure 2.2) does not provide information about the direct linkage between land use and human-induced soil degradation, “the types of human intervention that have caused the soil to degrade to its present status are all related to extensive land use activities (except the (bio) industrial activities)” (Oldeman, 1992).

Box 1. human factors causing soil degradation

Deforestation and removal of the natural vegetation: This causative factor is defined as removal of the natural vegetation (usually forest) of stretches of land. The reason for this clearing may be the reclamation of land for agricultural purposes (cropping or cattle raising), large-scale commercial forestry, road construction, urban development, etc.

Overgrazing: Besides the actual overgrazing of the vegetation by livestock, this causative factor also includes other effects of livestock, such as trampling. Overgrazing usually leads to a decrease of the soil cover, which increases the water and wind erosion hazard. Trampling may cause compaction of the soil. A widespread effect of overgrazing is the encroachment of unfavourable (unpalatable or noxious) shrub species. Although this phenomenon certainly influences grazing potential, it is not distinguished as soil degradation, as the soil itself is not affected.

Agricultural activities: This causative factor is defined as improper management of agricultural land. It includes a wide variety of practices, such as insufficient or excessive use of fertilisers, shortening of the fallow period in shifting cultivation, use of poor-quality irrigation water, absence of anti-erosion measures, improperly timed use of heavy machinery, etc.

Overexploitation of vegetation for domestic use: This causative factor deals with the use of the vegetation for fuel wood, fencing, etc. Contrary to deforestation and removal of the natural vegetation, it usually does not lead to the complete removal of all vegetation. However, the remaining vegetation does not provide sufficient protection to soil erosion.

(Bio) industrial activities: These causative factors are directly related to the soil degradation type “soil pollution”.

Source: (Oldeman et al., 1990)

This project estimated that around 2 billion ha, the equivalent to 15 per cent of the world’s total land area, is degraded (of which 2 per cent is severely, 7 per cent moderately, and 6 per cent lightly degraded). Regarding usable land, 23 per cent of

agricultural land, pasture, forest and woodland has been degraded due to human activity since the 1950s (Clarke et al., 2002; Gibbs & Salmon, 2015; Oldeman et al., 1990). The main types of soil degradation, as reported by GLASOD, are water erosion (56 per cent), wind erosion (28 per cent), chemical degradation (12 per cent) and physical degradation (4 per cent). Causes of soil degradation include overgrazing (35 per cent), deforestation (30 per cent), agricultural activities (27 per cent), overexploitation of vegetation (7 per cent) and industrial activities (1 per cent) (Oldeman et al., 1990; WBGU, 1994).

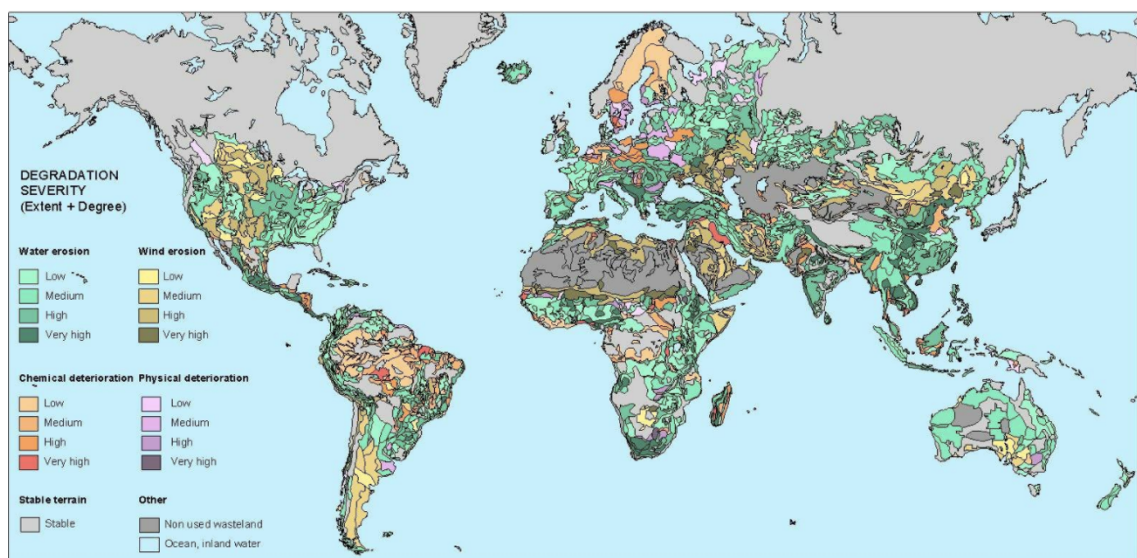


Figure 2. 2 Global assessment of human-induced soil degradation (GLASOD).

Source: Oldeman et al., 1990.

GLASOD was the first comprehensive assessment of global soil degradation, and despite criticism of the subjectivity, consistency and reproducibility of its expert-based approach (Bai et al., 2008, 2010; Sonneveld & Dent, 2009), it is still relevant and used today as it continues to be “the only complete, globally consistent information source on land degradation, widely used and interpreted” (Gibbs & Salmon, 2015). Moreover, this project was intended to increase the awareness of policymakers and decision makers about soil degradation problems on the occasion of the Earth Summit 1992 (UNCED) in Rio de Janeiro rather than provide a definitive technical report for policymaking at the national or sub-national level (FAO & ITPS, 2015; Oldeman, 1992).

Datasets on soil degradation are extremely variable depending on interpretations and approaches to measurement. For example, the FAO TerraSTAT interpretation of GLASOD by Bot and colleagues (2000) estimates that over 6 billion ha, the equivalent to 66 per cent of the global terrestrial surface, has been degraded, leaving only a third of the surface in good condition (Gibbs & Salmon, 2015).

Another relevant initiative that quantified soil degradation was the Global Assessment of Lands Degradation and Improvement (GLADA), carried out between 2006 and 2009 within the GEF-UNEP-FAO program Land Degradation in Drylands (LADA). This assessment is based on remotely sensed data and existing datasets (such as the normalised difference vegetation index, biomass production trend, biomass and climatic data integration, and landscape stratification using land cover and soil and terrain data). This project defined land degradation as the “long-term loss of ecosystem function and productivity caused by disturbances from which land cannot recover unaided” (Bai et al., 2008, p. 223).

GLADA results indicate that in the years between 1981-2003, 24 per cent of the land area was degraded mainly in tropical Africa, South-East Asia and south China, north-central Australia, the Pampas and swaths of the boreal forest in Siberia and North American taiga (Bai et al., 2008; Gibbs & Salmon, 2015). According to Bai et al. (2008), GLASOD “estimated that 15 per cent of the land was degraded, much of which does not overlap with the areas highlighted by the new analysis; land degradation is cumulative – this is the global issue” (Bai et al., 2008). Nonetheless, this method also received criticism due to the weaknesses of satellite-based assessments to capture degradation that occurred historically. Therefore, while it may identify recent or ongoing degradation (by quantifying changes in productivity), it cannot capture lands affected by degradation in the past (Gibbs & Salmon, 2015). Moreover, as the leading authors of the report stated, “results cannot be directly related to known soil degradation problems such as erosion or salinization” (Bai et al., 2010).

Thus, although various approaches for measuring soil degradation have been developed (i.e., expert opinion, satellite-based approach, biophysical models,

abandonment of agricultural lands), their reliance on proxies does not provide a direct measurement of degradation. For more than 40 years, attempts to assess global soil change have been made, but to date, there is no clarity on “where soil degradation takes place, what impact it has on the population, and what the cost to governments and land users would be if the decline in soil, water and vegetation resources continued unabated” (FAO & ITPS, 2015, p. 43).

Gibbs and Salmon (2015, p. 19) claim that this lack of consistency in information might be expected considering “the significant measurement challenges of capturing a dynamic and subjective condition. Site-specific context, such as soil type, topography, farming practices and land use history, all influence degradation”. Although there is important soil scientific knowledge and technology available, they are regarded by Stavi and Lal (2015) as fragmented and non-consensual²¹. Consequently, this impacts the way in which the key role of soils is integrated into environmental reports and, thus, affects how it is communicated in the public and policy arenas (Bouma & McBratney, 2013).

Despite these critiques, past attempts to measure degradation contribute to the discussion about the overexploitation of the soil by humans. Human-induced soil degradation has been increasingly recognised as a critical problem for sustainable development by international organisations and conferences like the 1992 Earth Summit (United Nations Conference on Environment and Development) held in Rio de Janeiro and one of its outcome conventions, the United Nations Convention to Combat Desertification (UNCCD), the MEA, the Global Soil Partnership (GSP), and the 2030 Agenda for Sustainable Development and its Sustainable Development Goals (SDGs), the

²¹ An example of this is the controversy surrounding the claim that we only have 60 years left to grow crops (FAO, 2015a). This headline hit many news media outlets in recent years. Nevertheless, some reporters and researchers argue that no scientific evidence supports the claim (Wong, 2019; Ritchie, 2021). In a recent study attempting to determine the productive lifespan of the world’s soils, Evans et al. (2020) concluded that rates greatly vary across regions and depend on different site-specific variables (e.g., climate, slope and soil texture). More specifically, they observed that 93 per cent of the soils under conventional farming systems were thinning, of which 30 per cent have lifespans of less than 200 years, with 16 per cent less than 100 years (including in wealthy nations such as Australia, UK, China and USA). They also showed that conservation practices enhance lifespans and thicken soils, and in their estimations, 48% of soils under this management system exceed 5000 years and 39% 10000 years.

Intergovernmental Technical Panel on Soils (ITPS), the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), and the Intergovernmental Panel on Climate Change (IPCC).

In the context of the International Year of Soils in 2015, the FAO launched the first major worldwide assessment ever realised on soils, the “Status of the World’s Soil Resources”, according to which about 30 per cent of global land area has already experienced significant degradation. Three-quarters of the ice-free global surface has been changed by human use. One-third of grasslands, a quarter of croplands, and almost a quarter of forests experienced degradation over the last three decades (FAO & ITPS, 2015; WWF, 2016). In the past 150 years, one-third of all soils and more than half of agricultural soils were moderately or highly degraded. Furthermore, according to the World Soil Atlas (2015), due to unsustainable management of soils, every year, 24 billion tonnes of fertile soil is lost.

The advancement of industrialised capitalist agriculture, intensified in the last sixty years (since the so-called Green Revolution), with the introduction of high-yielding crops, fertilisers and pesticides²², among other techniques (Matson et al., 1997), has become one of the primary drivers in land-use change (Rockström et al., 2009), currently pushing soils to transgress four out of the nine planetary boundaries into a high-risk zone (i.e., biosphere integrity, biogeochemical flows, land-system change and freshwater use) (Campbell et al., 2017). Other critical global drivers of soil change today are population growth, urbanisation, education, cultural values, war and civil strife, market effectiveness, social equity and climate change (FAO & ITPS, 2015; Montanarella et al., 2016).

IPBES (2019) Global Assessment Report on Biodiversity and Ecosystem Services stated that 14 of the 18 assessed²³ contributions of nature to people are in rapid

²² IPCC (2019) reports that the use of inorganic nitrogen has increased by nearly nine-fold, and irrigation water use has almost doubled.

²³ Most of the assessed categories were regulating services (e.g., regulation of freshwater quantity and quality; regulation of climate; regulation of air; formation, protection and decontamination of soils and sediments) and non-material (cultural services) (e.g., physical and psychological experiences; learning and inspiration; supporting identities).

decline due to human activities such as agricultural production, bioenergy production and harvest of materials. Furthermore, it reports that in the past five decades, the value of agricultural production has increased three-fold while soil organic carbon has declined, “indicating that gains in material contributions are often not sustainable” (2019, p. 11). According to FAO (2020, p. 23), although the state of soil biodiversity is largely unknown due to difficulties in assessing soils’ complex web of life, it is known that agricultural activities modify soil biodiversity. Moreover, intensification negatively impacts the functions performed by soil organisms and fauna (e.g., soil structure formation and ecosystem engineering). IPCC (2019) Report on Climate Change and Land reveals that between 2007 and 2016, anthropogenic emissions of greenhouse gases from agriculture, forestry, and other land uses equals 23 per cent of global emissions.

2.1.4 Conclusions

Human-induced soil degradation is a pervasive, systemic phenomenon that, in the past years, has sparked debate amongst experts and the international community as it challenges sustainable development and the capacity of soils to perform critical functions and processes for life on Earth. Recent reports by international organisations (Díaz et al., 2019; FAO et al., 2020; FAO & ITPS, 2015; IPCC, 2019; Scholes et al., 2018) insist on the necessity to raise awareness and take action to avoid, reduce and reverse degradation processes that affect 3.2 billion people, and are driving the planet towards a sixth mass species extinction (Ceballos et al., 2017; Scholes et al., 2018).

Although the effects of soil degradation may not be easily detected because they are cumulative over time, once lost, soils cannot be restocked effectively for hundreds of years because the rates of soil formation are very slow. As a result, cases of severe degradation of the soil are generally difficult to restore (Bouma & McBratney, 2013). For that reason, as was stated in the Revised World Soil Charter (FAO, 2015b), actions oriented to minimise or eliminate significant soil degradation (e.g., no tillage –conservation agriculture – rotation of crops, rotation of crop residues, agroecology and agroforestry) are essential if we seek to maintain

the services provided by soils, and this is significantly more cost-effective than rehabilitating soils after degradation has materialised. Ultimately, how we govern the planet's soils will be interwoven with the integrity of ecosystems and human welfare. In the next section, I will address how the international community is approaching this multiscale social-ecological challenge.

2.2 The global governance challenge

It is estimated that by the year 2050, the world's population will grow to 9.7 billion, and food production will need to increase by 60 per cent to satisfy the demand (Laban et al., 2018). Consequently, in the forthcoming decades, additional pressures on soil are expected as a consequence of population growth with the concomitant demands for food and bioenergy production, aggravating soil degradation processes. Since several environmental problems are soil-related, this will also affect water sustainability, climate change, energy sustainability, ecosystem services delivery and biodiversity protection. Therefore, the problem is likely to worsen in the future if effective actions are not taken.

Until recently, both in international and national contexts, the soil was regarded as “the poor cousin” of environmental resources, especially compared to the attention given to other natural resources such as water and air, and environmental issues such as climate change, biodiversity loss and food insecurity (Boer et al., 2017; Boer & Hannam, 2015). In this vein, Fromherz (2012, p. 63) argues that “[s]oil must surely rank as the most underappreciated natural resource”. Additionally, the high complexity of soils means that they are “poorly understood when compared with other environmental media” (Tzilivakis et al., 2005). Nevertheless, the global community has agreed on three major environmental goals: halting biodiversity loss, limiting global warming to 2° Celsius, and securing access to food for an increasing population, all of which cannot be attained without fertile soils (Chemnitz et al., 2015).

In this section, I will first introduce some key terms to discuss current conceptualisations of soil governance. Then, I will describe the historical process that shaped the international architecture of contemporary soil governance, which

according to experts and scientific reports, remains fragmented and dispersed despite the emergence of several soil-specific instruments and initiatives in the past decade.

2.2.1 Conceptualising soil governance

Since the 1980s, governance has become a ubiquitous term, and today multiple theories and governance “worlds” coexist, turning it into a vague and contested concept (Bevir, 2010, 2012). However, amongst those diverse approaches, common ground can be found in considering governance as a shift from the traditional “command and control” (Pierre & Peters, 2005), “do-it alone” (Kooiman, 2003) government, to more collective forms of governing by including other public bodies, the private sector and civil society to achieve public goals (Nederhand et al., 2019). Also, as Klijn and Koppenjan (2016, p. 6) observe, these approaches focus on the “*process* of governing rather than the *structure* of government”. Therefore, as has been recurrently noted in the literature, “governance” is not a synonym for “government”: whereas the latter implies centralised institutional arrangements (or tools of governance) that structure authority and order, the former is broader, comprising “all forces that can influence human behaviour are potential tools of governance” (Bosselmann et al., 2008, p. 4). To Bevir (2012), the governance concept reflects the increasing dependence of the state on civil organisations and the limitations imposed by international institutions (e.g., global industrial and financial markets, regional blocks, etc.). Kooiman (2003) argues that the “reshuffling of government tasks” under the governance perspective results from the growing awareness that complex societal problems require the involvement of multiple actors but by no means renders the government obsolete.

Most governance approaches acknowledge the government’s significance to a lesser (e.g., self-governance) or greater degree (e.g., authority-based governance). Therefore, they assume a different perspective than the extreme “hollowing out the state” or “governance without government” that has been gaining traction since the late 80s in favour of markets and privatisation over the public sector (Peters & Pierre, 1998; Rhodes, 1996). For example, the network governance

approach (Jones et al., 1997; Kooiman, 1993; Rhodes, 1996) contemplates the government as a key player but not as the exclusive governing process controller. Instead, such processes are “subject to negotiations between a wide range of public, semi-public and private actors, whose interactions give rise to a relatively stable pattern of policymaking that constitutes a specific form of regulation, or mode of coordination” (Sørensen & Torfing, 2007, p. 4). Under this lens, governance includes the totality of the negotiated interactions in a specific policy domain or problem setting; and, thus, is facilitated and constrained by a particular political and institutional environment. Furthermore, the government has active participation in the network by fostering articulation, collaboration and co-production of services (Nederhand et al., 2019).

In the field of sustainability, governance approaches²⁴ highlight the importance of participation where many stakeholders (governmental, social and private sector) with divergent interests and values have to negotiate intricate, erratic and unpredictable issues. Therefore, they recognise the political nature of sustainability to promote systems change (Meadowcroft, 2007). Considering that conflicts of interest are an inherent aspect of environmental problems, public institutions have a fundamental role in the distribution of power, arbitrating “whose interests are to prevail, and to what degree” (Paavola, 2007, p. 94). Consequently, Paavola (2007) observes that the choice of tools of governance²⁵ to solve environmental problems is a matter of social justice (instead of economic efficiency) since they end up creating, endorsing or redefining entitlements in environmental resources (i.e., *res nullius*, common property, private property). In

²⁴ A gamut of frameworks has proliferated in the past decades, including adaptive governance (Folke et al., 2005; Olsson et al., 2006), reflexive governance (Voß et al., 2006; Voß & Bornemann, 2011), experimental governance (Monkelbaan, 2015; Sabel & Zeitlin, 2012), and collaborative governance (Gieseke, 2019). They provide conceptual guidelines to address constantly changing environments, ranging from experimentation and learning to adapt, exchange knowledge practices between actors, and building relationships of trust to cope with complexity, uncertainty, and continuous conflicts of interest.

²⁵ Governance institutions in the soils space have been classified by Juerges and Hansjürgens (2018) as *formal*: regulatory instruments (e.g., soil protection legislation, agriculture legislation), planning instruments (e.g., land-use plans which determine areas under protection), economic instruments (e.g., subsidies, taxes), informational instruments (e.g., soil databases, technical education) and cooperative instruments (e.g., voluntary agreements); and *informal*: norms, attitudes and perceptions of stakeholders.

a similar vein, Duit et al. (2016) argue that states matter in environmental issues because they are the reservoir of legal frameworks (e.g., property rights) and provide economic and administrative resources through taxation and expenditure, but also because public systems of regulation continue to be the basis of environmental management practices. In their view, states “remain the most powerful human mechanism for collective action that can compel obedience and redistribute resources” (Duit et al., 2016, p. 3). However, under current scenarios of increasing interdependence amongst people, societies and nature, environmental problems such as soil degradation cannot be analysed in isolation at the nation-state level. Local environmental challenges have global consequences, and therefore searching for sustainable pathways requires reflecting on the multi-level nature of those challenges guided by a “strong ethical sense” (Bosselmann et al., 2008).

Natural resource governance is a fundamental component of sustainability. The International Union for Conservation of Nature (IUCN) has developed the Natural Resource Governance Framework (NRGF) to assess and strengthen these processes in different contexts (Martin et al., 2016). This framework (IUCN, 2021) provides a comprehensive definition of natural resource governance as:

“[...] the norms, institutions and processes that determine how power and responsibilities over natural resources are exercised, how decisions are taken, and how citizens – women, men, indigenous peoples and local communities – participate in and benefit from the management of natural resources. The effectiveness and equity of governance processes critically determines both the extent to which ecosystems contribute to human well-being and the long-term prospects for successful conservation of nature. Securing rights and sharing power and responsibilities through strengthened natural resource governance, including legal entitlements, benefits both people and biodiversity”.

What makes the above definition particularly interesting is the explicit reference to power. Depending on the choice of instruments to shape its distribution, power can promote or obstruct social justice in environmental

governance, as Paavola pointed out. Furthermore, I would add that the distribution of power and responsibilities guided by the principle of equity (as mentioned by the IUCN) is also fundamental to other justice-related movements, i.e., environmental and ecological justice. Whereas social and environmental justice are intrinsically connected in their claims for equity, recognition, and participation for humans (Schlosberg, 2004), ecological justice contends that non-humans are *also* part of the community of justice (Okereke & Charlesworth, 2014). Compared to the other movements, ecological justice has not received the same amount of attention in natural resource governance scholarship²⁶. In simple terms, this vision emphasises the need to prevent the harmful exploitation of nature, or as White (2008, p. 19) puts it, “[e]cological justice demands that how humans interact with their environment be evaluated in relation to potential harms and risks to specific creatures and specific locales as well as the biosphere generally”. Ecological justice is, in my perspective, an *expansion* of the justice domain and not a displacement or neglect of the manifold and multifaceted forms of injustice to humans²⁷.

In the specific case of soils, definitions of governance are rather sobering if compared to the one provided by the IUCN. For example, FAO (2021b) states that soil governance,

“[...] concerns policies and strategies and the processes of decision making by nation states and local governments on how the soil is utilised. Governing the soil requires international and national collaboration between governments, local authorities, industries and citizens to ensure implementation of coherent policies that encourage practices and

²⁶ A search in google scholar shows that, if, for example, we look for the words “environmental justice” and “natural resources” between the years 2010-20, 20,700 results are displayed, whereas if we use “ecological justice” and “natural resources” for the same period of time, it reports 3,710 results. One may expect that this trend is likely to shift as the ecological crisis intensifies and the Covid-19 pandemic exposes the interconnectedness of ecosystem degradation to human health, creating awareness about biosphere integrity and fertilising the ground for discussions about the intrinsic value of natural resources and ecosystems.

²⁷ I will discuss issues of power and ecological justice in more detail in Chapters 6 and 7, respectively.

methodologies that regulate the usage of the soil resource to avoid degradation and conflict between users”.

The governance of soils is complex for several reasons. First, due to the intricate nature of soil-related problems (e.g., the insidiousness of spatial and time scales, transboundary effects, and external effects, among others). Second, in most parts of the world, soils are privately owned (Heuser, 2019). Third, soils are a source of production and wealth, which drive landholders’ attitudes, perceptions and management practices (Martin, 2017). Consequently, as Martin (2017, p. 32) argues, soil governance should not only be concerned with developing policies and instruments at the individual level to avoid or change the “irresponsible behaviour of land stewards, particularly farmers”, it should also investigate the systemic factors that influence such behaviour, and which are beyond the control of the individual. Following these considerations, a more ample definition of soil governance influenced by the IUCN perspective would be benefitted by considering power relations (Engel-Di Mauro, 2014; Scoones et al., 2013), addressing private property rights and public interests (Bartkowski et al., 2018; Bartkowski & Bartke, 2018; Moroni, 2018), market pressures and incentives (Gomiero, 2016; Sartori et al., 2019) with an ethical perspective (Hansjürgens et al., 2018; Thompson, 2017). Furthermore, some scholars claim that sustainable soil governance requires comprehensive approaches that understand the interactions between ecosystem services and soil functions and processes, taking into consideration the several levels of decision making and interactions with other policy fields (Helming et al., 2018; Wyatt, 2008).

In conclusion, soil governance shapes interactions between humans and soils. Therefore, in addition to establishing management guidelines, regulations and incentives for sustainable use, it should also integrate wider societal and ecological targets in such a way that considers the interests of present and future generations and the integrity and vitality of soils.

2.2.2 Global soil governance: a historical perspective

Global soil governance has been defined by Juerges and Hansjürgens (2018, p. 1634) as “the sum of institutions developed in international processes that set principles for sustainable soil management to protect global soil resources and to allow sustainable soil productivity”. Despite the many institutions, initiatives and instruments that have been developed in the past three decades, coordination across the different governance levels (international, national, and local) and policy sectors remain fragmented²⁸.

To better understand where global soil governance stands today (addressed in the next section), I will first draw on Boer, Ginzky and Heuser’s (2017) historical analysis of the development of international soil protection law, which identifies three moments towards a global regime for soils. The first phase started with the 1972 United Nations Conference on the Human Environment in Stockholm, which produced two critical outcomes for international environmental governance: the Action Plan for the Human Environment and the creation of the United Nations Environment Programme (UNEP). Although the Action Plan did not include soil-related actions, it opened a period in which instruments for soil protection were created: the European Soil Charter (1972), FAO’s World Soil Charter (1981), and UNEP’s World Soils Policy (1982). These last two, though non-binding, serve “as conjunctive instruments to encourage international cooperation in the rational use of soil resources” (Boer et al., 2017). A relevant treaty developed in this period is the Ramsar Convention which came into force in 1975 and focuses on the conservation and sustainable use of wetlands. It is considered a relevant instrument for international soil governance because, over the decades, it has shifted in focus to the protection of wetlands as ecosystems and the ecosystem

²⁸ On 16 January 2021, the Global Soils Partnership (FAO) hosted a Webinar entitled “Soil Governance”. On that occasion, Eduardo Mansur, Director of FAO’s Climate Change, Biodiversity and Environment Division, made an important observation, in his words: “[...] it is not that we do not have soil governance, but we have it fragmented being split into different legal areas, in agriculture, in the environment, in forestry, in urban planning, in mining, and different administrative levels”. Available at: <https://www.youtube.com/watch?v=zEpTtbT3s6M&t=3749s> [Accessed: 1 June 2021].

services they provide, including an instrument (the Montreux Record, 1990) to avoid and reverse land degradation (Bodle & Stockhaus, 2020).

The second phase began with the United Nations Conference on Environment and Development in Rio de Janeiro in 1992, which resulted in three binding conventions: the United Nations Framework Convention on Climate Change (UNFCCC, 1992), the Convention on Biological Diversity (UNCBD, 1992), and the United Nations Convention to Combat Desertification (UNCCD, 1994). The three “Rio Conventions” are a crucial milestone in international environmental governance as they create legal frameworks to address environmental threats that are intrinsically linked and reverse trends of environmental degradation. They are regarded as a framework for countries to implement sustainable development initiatives, targeting the mitigation of human-induced climate change, the protection of biological diversity and the mitigation of desertification processes.

Although the soil is not the specific focus of the three Rio Conventions (Boer & Hannam, 2015), it is a cross-cutting theme (Montanarella & Lobos Alva, 2015). The UNCCD is the only legally binding international agreement that relates to soils by “the promotion of bio-productive land”, though essentially aiming to mitigate the effects of droughts and limit desertification processes in drylands (Boer et al., 2017). As Wyatt (2008) explains, though this treaty addresses soil conservation and management issues, it does so concerning specific soil types, functions, and threats. Furthermore, she argues that rather than regulatory, this is a capacity-building instrument that focuses on process and a bottom-up approach (Wyatt, 2008, p. 119). Overall, the convention does not refer to soils as a “common concern for humankind”, as is the case for climate change and biodiversity (Boer & Hannam, 2015). However, if we recognise that soil biodiversity is a concern for humankind, it provides an “important theoretical justification for global responsibility for soil protection, justifying international action regarding resources generally occurring within national boundaries while still acknowledging state sovereignty” (Wyatt, 2008, p. 131). Despite the CBD’s more holistic view through an ecosystem-based approach that provides conceptual guidelines for sustainable soil management, soils are not addressed

comprehensively but rather indirectly (Stringer, 2008; Wolff & Kaphengst, 2017; Wyatt, 2008). Soils are also a pool of organic and inorganic carbon and, thus, are of critical relevance for the UNFCCC. Sustainable agricultural management practices can contribute to combating climate change by removing carbon from the atmosphere. Although awareness about the potential role of soils in climate change mitigation has increased in the past years, they have not received much attention in international climate policy; neither the UNFCCC, the Kyoto Protocol, nor the Paris Agreement address them explicitly (Streck & Gay, 2017).

Considering the lack of international legally binding instruments for soil protection, in 1994, the German Advisory Council on Global Change (WBGU) proposed in its annual report to advance the UNCCD into a global soil conservation convention. This recommendation was picked up by the Protestant Academy of Tutzing, Germany, which in 1998 submitted a draft proposal for a Convention on the Sustainable Use of Soils. This draft was largely debated in the following years at several stakeholder meetings and conventions but did not reach the political consensus required to be introduced into the intergovernmental debate (Montanarella & Vargas, 2012).

During this period, a landmark in soil protection policy at a regional scale was the publication of the European Commission (2002) “Towards a Thematic Strategy for Soil Protection”. This document resulted from the discussions promoted by the European Soil Forum (1999, 2000, 2001) that aimed to gather and share information about national approaches to soil protection (Römbke et al., 2005). The European thematic strategy was one of the most important initiatives for valuing and caring for the soil. Moreover, it introduced relevant concepts such as soil protection and soil threats. In addition, as Römbke and colleagues (2005) point out, some key statements were made for the first time in an official European Commission document, such as the acknowledgment that soil is a largely non-renewable resource increasingly under pressure.

Twenty years after the Rio Conference, the international community gathered once again in Rio de Janeiro for the United Nations Conference on Sustainable Development (Rio+20), with the objective of securing renewed political

commitment for sustainable development, assessing progress and remaining gaps in implementation, and addressing new and emerging challenges (United Nations, 2012). According to Boer, Ginzky and Heuser (2017), Rio+20 opened the third phase of global soil protection regulation. Countries at the conference, recognising that in the past two decades, both land and soil degradation were still global problems occurring at high rates that affected food production, subscribed in the outcome document “The Future We Want” to “strive to achieve a land-degradation-neutral world in the context of sustainable development” (United Nations, 2012, p. 36). This agreement was developed later during the post-development agenda conversations for defining the Sustainable Development Goals (SDGs) in 2015 (Keesstra et al., 2016).

The introduction of the concept of Zero Net Land Degradation (ZNLN)²⁹ by the president of the UNCCD in 2011 served to advocate during Rio+20 for a specific SDG on Land Degradation Neutrality (Chasek et al., 2015; UNCCD, 2011). The concept implies two intertwined processes: sustainable management of non-degraded lands in order to avoid degradation and limit further loss and restoration of degraded lands (Lal et al., 2012). In other words, a balance between land degradation and restoration. ZNLN was finally translated into the SDGs (target 15.3) as Land Degradation Neutrality (LDN), defined as a “state whereby the amount and quality of land resources necessary to support ecosystem functions and services and enhance food security remain stable or increase within specified temporal and spatial scales and ecosystems” (UNCCD, 2015). According to Akhtar-Schuster et al. (2017), this definition of LDN provided by the UNCCD, apart from being vague and incomplete, is anthropocentrically focused on the context of global food security “by including the aim to stabilize or increase food security by enhancing the provision of land’s ecosystem services and thus enhancing human livelihoods” (Akhtar-Schuster et al., 2017). Nevertheless, others point out that despite the LDN shortcomings and lack of coherent approach to soils, it has set up

²⁹ The emergence of this concept is the result of the recognised necessity for a shift in the UNCCD, which so far has not been successful in achieving its commitments, and the National Action Plans (NAP) have proven irrelevant to mainstream policymaking and development cooperation (Chasek et al., 2015).

a “central, global political point of reference that should be supported” and can provide grounds for advancing international soil governance (Bodle & Stockhaus, 2020, p. 13).

In a nutshell, all the multilateral environmental agreements and associated instruments and initiatives sponsored by the United Nations are related to soil issues. However, most of them address them fragmentarily and indirectly. The global governance of soil resources is dispersed in a “hodgepodge of legal instruments” (Wyatt, 2008) that lacks a comprehensive vision of soils problems and, thus, of soils protection. IPBES report on land degradation and restoration claims “that greater commitment and effective cooperation” to these treaties at all levels is necessary for avoiding further degradation of soils and biodiversity loss (Scholes et al., 2018, p. 7). In Figure 2.3, the historical development of global soil governance is presented with a timeline that includes the most significant initiatives, instruments, and scientific assessments, directly and indirectly, related to soils.

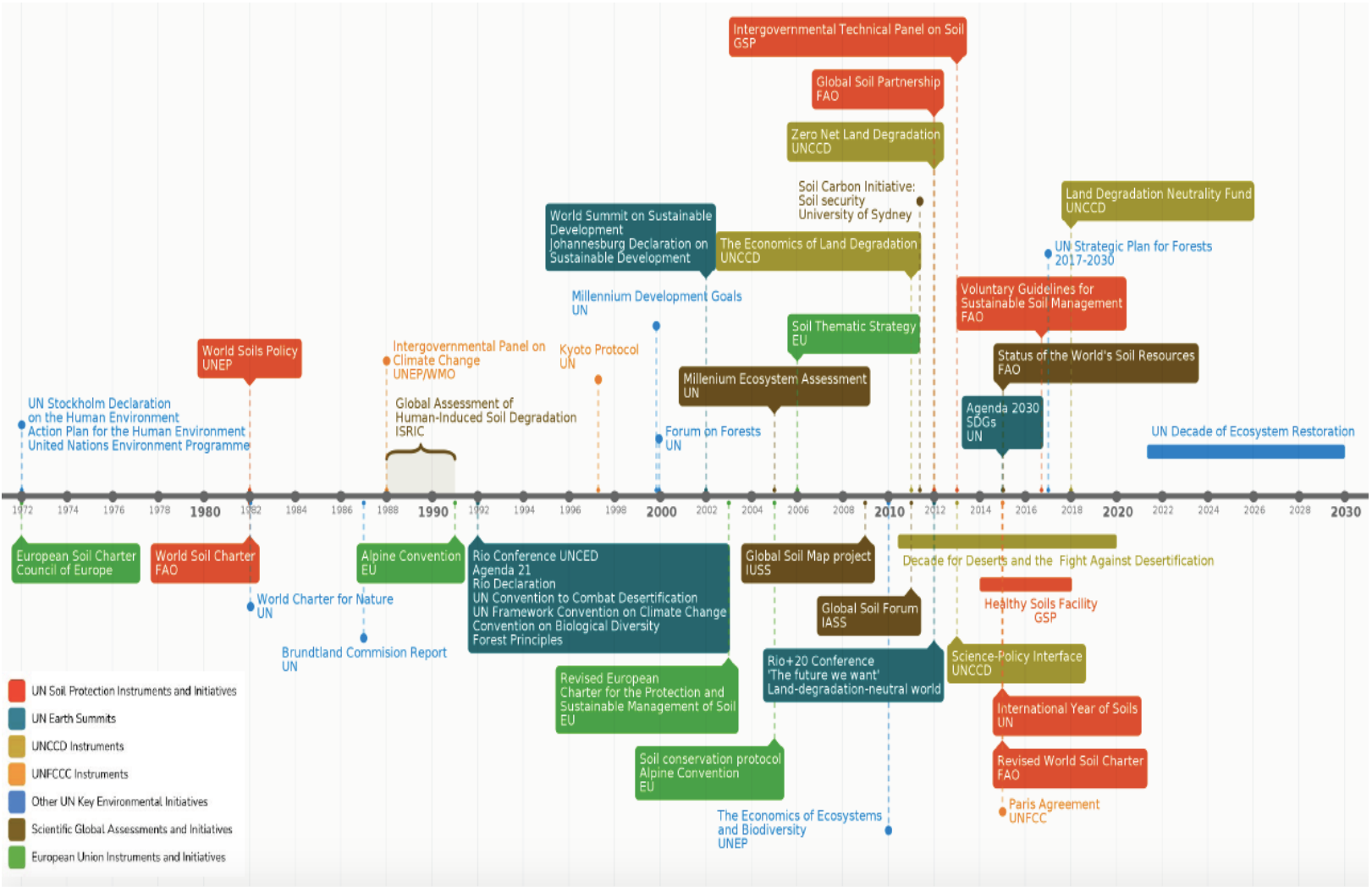


Figure 2. 3 International development of soil governance timeline.

Source: This research.

2.2.3 A timid momentum

Several authors agree that since the beginning of the 2010s, the increasing recognition of the global proportions of soil degradation and the necessity for actions to protect this resource has led to an emergent “international soil policy community” (Boer et al., 2017; Flasbarth, 2017; Hill, 2017; Koch, 2017). According to Montanarella and Vargas (2012), the recent international turn towards soil protection and rehabilitation arose in the aftermath of the latest world food crisis. In 2007 and 2008, global prices of basic food crops such as corn, wheat, soybeans and rice increased significantly, triggering a food and social crisis that affected both developing and developed countries, causing social and political distress. According to the United Nations (2011), the spikes in prices of food commodities were the result of the combination of several factors, including droughts in grain- and cereal-producing nations and rising oil prices, a greater demand for biofuels, changing consumption patterns and financial speculation in the food market. The debate regarding the real causes signals that these factors are only proximate and that the cause of the crisis is much more profound, rooted in a global food system that is highly vulnerable to economic and environmental shocks (Holt-Gimenez, 2008). As a result, policymakers started to recognise that soil resources for food production are limited, and therefore, food security is at risk.

This rising awareness has been embodied in the emergence of institutions, instruments and initiatives for the global governance of soil resources. Amongst the most prominent initiatives is the Global Soil Partnership (2012), hosted by FAO and its scientific and technical advisor, the Intergovernmental Technical Panel on Soils (2013). The GSP is an attempt to fill the vacuum in the international governance of soils since there is no existing international governance body to support coordinated global action on soil management. Thus, the GSP aspires to become a unified and authoritative voice for soil management and coordination of efforts over limited soil resources.

The GSP is intended to position soils on the international agenda by strengthening collaboration and synergy of efforts among stakeholders (from land

users to policymakers) and raising awareness of the key role of soils in food security and improved food nutrition, climate change adaptation and mitigation and the provision of essential ecosystem services. Soil conservation, enhancement and restoration (where possible) through sustainable soil use is the ultimate goal. The GSP mandate is to improve global governance of soils by “providing a favourable policy environment and technical solutions for soil protection” (GSP, 2011). The initiative is voluntary; therefore, there are no legal bindings on its members.

Other relevant international initiatives include the declaration of 2015 as the International Year of Soils and the 5 December as the World Soil Day by the 68th United Nations General Assembly (2013); the Vienna Soil Declaration “Soil matters for humans and ecosystems” (2015); the “4 per 1000 initiative: Soils for Food Security and the Climate”³⁰, under the framework of Lima-Paris Action Plan (2015); and, the Global Soil Forum and the Global Soil Week (2010) led by the Institute for Advanced Sustainability Studies (Potsdam, Germany). Moreover, there has been the United Nations Decade for Deserts and the Fight Against Desertification” (2010-2020), which aimed to address land degradation by raising awareness, promoting sustainable management of land resources, and ensuring the long-term ability of drylands for humanity’s well-being³¹.

Furthermore, a set of instruments that contribute to the international architecture of soil governance has been launched recently. Amongst them, the Voluntary Guidelines for Sustainable Soil Management (FAO, 2016) aim to serve as a reference for sustainable soil management, introducing technical and policy recommendations for stakeholders. The Healthy Soils Facility Trust Fund (GSP, 2014-2018) is intended as the “operational arm” of the GSP, and the Revised World Soil Charter (FAO, 2015) updates the vision and guiding principles of the World Soil Charter from 1982, especially regarding emergent or exacerbated soil issues

³⁰ The initiative proposes an annual increase of 0.4% in soil organic carbon by improving land management practices adapted to the local conditions and following the principles of, for example, agroecology, agroforestry and conservation agriculture. Available at: <https://www.4p1000.org/4-1000-initiative-few-words> [Accessed: 1 September 2021].

³¹ The Decade campaign is intended to reinforce the implementation of the ten-year strategy for 2008-2018 on the implementation of the UNCCD.

(e.g., pollution, climate change adaptation and mitigation and urban expansion). In 2021 the GSP launched SoiLEx, a global database on existing legal instruments concerning soil protection and prevention of degradation. Information on policy instruments by countries is accessible to users on a various topics (e.g., erosion, organic carbon loss, nutrient imbalance, salinisation and acidification, and biodiversity loss, among others).

These soil-focused emergent initiatives and instruments contribute to strengthening what still can be considered a rather weak and fragmented global governance of soils. As Bodle and Stockhaus (2020, p. 3) argue, soil governance is “piecemeal and spread over parts of different mandates”, which results in overlaps between international institutions. Until the beginning of the 2010s, the most important instrument for soil protection was the World Soil Charter from 1982 (FAO), which stated 13 guiding principles to be adopted by FAO member states but with little impact overall (Montanarella & Vargas, 2012).

Soils play a vital role in the SDGs³², although it should be noted that for some scholars, soils are not a goal by themselves (Bouma & Montanarella, 2016), and for most of the goals, there is no direct connection to them (Keesstra et al., 2016). Although attempts were made to include soils as a standalone goal, they failed (Hill, 2017). To Hou (2020, p. 529), a potential explanation for this failure is the lack of representation of soil scientists in high-level policy talks. Furthermore, according to Bouma et al. (2019, p. 539), soil scientists not only were unrepresented on the committees elaborating on the SDGs but also were not involved in developing targets and indicators for the soils-related SDGs, undermining soils visibility.

Soils are more directly addressed in Goal 2 regarding food security and sustainable agriculture, which explicitly emphasises the need to improve land

³² In the International Year of Soils, at the United Nations Sustainable Development Summit held on 25 September 2015 in New York, world leaders adopted the 2030 Agenda for Sustainable Development, which includes a set of 17 Sustainable Development Goals (SDGs) to end poverty, fight inequality and injustice, and tackle climate change by 2030. The SDGs substitute the Millennium Development Goals and should guide national policies and international cooperation in the next 15 years.

progressively and soil quality for sustainable food production systems, and in Goal 15 on terrestrial ecosystems, which addresses the need to combat desertification, halt and reverse land degradation and halt biodiversity loss. Target 15.3 focuses explicitly on the problem of land and soil degradation seeking to “[b]y 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world” (Transforming Our World: The 2030 Agenda for Sustainable Development, 2015). At the same time, soil issues are addressed indirectly since the ecosystem services they provide will be needed to achieve several of the targets across different SDGs, including Goal 1 on no poverty, Goal 3 on good health and well-being, Goal 6 on clean water and sanitation, Goal 7 on affordable and clean energy, Goal 12 on responsible consumption and production, and Goal 13 on climate action.

A key aspect of this post-development agenda is that it is universal and, therefore, applies to all countries, not only to developing ones as did its predecessor, the Millennium Development Goals (MDGs) (Transforming Our World: The 2030 Agenda for Sustainable Development, 2015). Although the SDGs are not legally binding, they are politically significant and set the sustainable development agenda for the next 15 years, endorsed by all member states. Moreover, unlike the MDGs, SDGs have to be implemented by all countries in the world, and not just by developing nations like the predecessor Millennium Development Goals (Keesstra et al., 2016). A recent Global Assessment on Biodiversity and Ecosystem Services conducted by IPBES suggests that under the current trajectories, SDGs related to nature (1-3, 6, 11-15) are unlikely to be met (Díaz et al., 2019). Bradshaw et al. (2021) explain this failure to the inadequate integration of SDGs to other socio-economic factors as we continue on the same trend of uplifting living standards at the expense of environmental degradation. In their words, “humanity is running an ecological Ponzi scheme in which society robs nature and future generations to pay for boosting incomes in the short term” (Bradshaw et al., 2021, p. 4). In the particular case of soils, the United Nations

Declaration of 2021-2030 as the Decade on Ecosystem Restoration³³ is considered critical to accelerating actions to achieve target 15, whose window is expected to close over this period (Díaz et al., 2019; Scholes et al., 2018).

Despite all these recent global initiatives, the soil continues to be largely considered fragmentary in the international system, addressing specific processes or functions that affect other environmental and social issues such as food production, carbon sequestration, biomass, biodiversity, and water security. Of all these global socio-environmental concerns, food production has given the most publicity to the soil (by targeting the soil-specific function of food production). This preoccupation has been growing rapidly, mainly due to the recent global food crises mentioned previously and aggravated by the projected exponential population growth and expected decline in fertile soils due to land-use change. As Kibblewhite and colleagues discuss (2012), arguments in favour of global and/or continental legal frameworks for soil protection are based on an agricultural-productive framing, which develops as follows: degradation of soil resources affects the capacity to produce food and, since this is a globally traded commodity, anywhere productive capacity is reduced can negatively impact on food availability and prices for the international community. Moreover, as Davies (2017) asserts, the most recent international initiative related to soil, the United Nations Voluntary Guidelines for Sustainable Soil Management, endorsed by the FAO, focuses only on agriculture.

In recent years, soil organic carbon has been gaining visibility for combating climate change besides its contribution to enhancing biodiversity, water cycling and agricultural productivity (Vermeulen et al., 2019). For example, the 4 per 1000 Initiative (2015) and the UNFCCC Koronivia Joint Work on Agriculture (2017) have served to bring attention to the potential of soils in tackling climate change. However, according to Vermeulen et al. (2019), these international frameworks

³³ In light of the negative trajectory towards meeting the SDGs by 2030, this declaration is a “rallying call for the protection and revival of ecosystems” seeking to fast-track restoration to meet the global goals (UN, 2021).

have not yet been accompanied by sufficient action at local and global scales. In addition, a renewed interest in soil biology demonstrates, according to Meulemans and Granjou (2020), that “we are now witnessing a (re)affirmation of the “living” nature of soil”. Although new materialist approaches emphasise a care ethic towards these non-human natures (Krzywoszynska, 2019; Puig de la Bellacasa, 2015, 2019), soil living organisms have also become an opportunity for agroindustry “to commercialize microbial inputs maximizing symbiosis and associations between plants and microorganisms” (Pessis, 2020).

In summary, many scholars have claimed the necessity for an international legally binding instrument for coherent governance of the soil without much success so far (Bouma & McBratney, 2013; Davies, 2017; Fromherz, 2012; Juerges & Hansjürgens, 2018; Keesstra et al., 2016; Montanarella et al., 2016; Montanarella & Vargas, 2012; Weigelt et al., 2013, 2015; Wyatt, 2008). Despite a decade of soil momentum, soils *per se* still lack a global status of priority concern³⁴. As Davies (2017, p. 310) argues, the lack of regulation just perpetuates the problem because “the need to comply with laws raises awareness”. Moreover, current soil protection instruments and initiatives seem inadequate to capture and prevent soil degradation trends, even in developed countries (Kibblewhite et al., 2012).

2.2.4 Conclusions

Present trajectories of soil condition may have catastrophic consequences that will affect millions of people, especially in vulnerable regions, in the forthcoming decades, and yet, the global community seems to be ill-prepared and ill-equipped to respond appropriately (Montanarella et al., 2016, p. 82). Soil degradation is a

³⁴ In a recent report for the German government, Bodle and Stockhaus (2020) provided a set of recommendations to improve international soil governance and eventually create an international treaty that includes: better coordination and coherence amongst international institutions’ mandates and activities, claiming soils as a “common concern” for humankind, reflecting soil footprint in trade and consumption patterns (e.g., food, timber products and non-food agricultural products) and integrating it in treaties and instruments (e.g. LDN and UNCCD), more substantial political support for the SDGs, discuss feasible policies and governance independent of tenure rights.

global problem that needs international and national action; therefore, it is a good example of the necessity to think globally and act locally (European Commission, 2006a). Despite growing initiatives aiming for soil protection and reversal of land degradation in recent years, they are still not receiving the necessary attention regarding appropriate use and management. Soils have been a second-tier priority in the international agenda in the past three decades as they were considered an infinite resource and have not been addressed directly in most global environmental initiatives. The World Soil Atlas (2015) indicated that “all of the more than 200 international treaties, agreements and protocols neglect soil conservation and fail to define specific targets” (Chemnitz et al., 2015). Until recently, the most critical instrument for soil protection was the World Soil Charter from 1982 (FAO), which stated 13 guiding principles to be adopted by FAO member states, but with little impact overall (Montanarella & Vargas, 2012). What is more, until the creation of the GSP in 2013, “no international governance body had existed that advocated for and coordinated initiatives to ensure that knowledge and recognition of soils are appropriately represented in global change dialogues and decision-making processes” (Montanarella et al., 2016).

Although soils have been gaining political momentum since the international community started to acknowledge their relevance to other global environmental challenges and ecosystem services, there is still no consensus that they require international policy and governance efforts (Bodle & Stockhaus, 2020). Fohmerz (2012, p. 57) claims that the international community “has failed to meet the soil crisis with the construction of an adequate legal regime”. In a similar vein, Amundson (2020) attributes the stagnant state of affairs in global soil governance to the absence of an international legally binding instrument.

In the next section, I will address why soils are also a low priority in governmental policy agendas. Beyond the explanations associated with the complex nature of soil degradation, understanding their second-rate status requires exploring how the problem is addressed in the political arena. To do so, I will focus on the role of the “model of causation” (Peters, 2015) in policymaking

which entails addressing the politics of problem definition and the process of agenda setting.

2.3 The public policy challenge

The recent and growing concern from the international community regarding soils sustainability has not yet translated into many governments' environmental agendas. As outlined by a 2015 FAO report on the Status of the World's Soil Resources, the inclusion of soil in public policy "has been weak in most parts of the world" (FAO & ITPS, 2015, p. 224). Though, in some countries, soils have entered the policy arena, and soil legislation has started being developed (Hartemink & McBratney, 2008), existing legal frameworks for soil conservation "seem not to be able to regulate the current use of soil resources in order to assure long-term sustainability" (Montanarella & Vargas, 2012, p. 1).

There are compelling reasons why soils should be protected in policy – aside from their intrinsic value – from an anthropocentric perspective that prioritises their instrumental value for human life. Globally, as Rombke et al. (2005) observed, existing soil policies are ruled by such anthropocentric considerations. In the first section of this Chapter, I addressed the critical role of soil functions and processes for human life: e.g., growth-promoting substrate for food production, filter for clean groundwater production, processes such as carbon sequestration controlled or performed by soil organisms, which are all sufficient reasons for protecting soils in public policy.

Considering that despite the amount of evidence suggesting the need for urgent actions (Chapter 2.1.3) to protect soils and halt degradation, they are still ignored in policy, this section aims to understand how public problems become "policy problems". In other words, it focuses on providing theoretical elements to understand how matters of concern become matters of political attention and subject to the political process. The purpose is to explore conceptualisations from the field of policy studies to assist in understanding the challenges of problem definition and agenda setting in the process of policymaking.

In the remainder of this section, I will first introduce the traits that are often referred to in characterising soils as a “complex” public problem. Then I will delve into theoretical perspectives that explain how public problems turn into policy problems, assuming a constructive/interpretive position of reality. Finally, I will focus on the role that the model of causation portrayed by Peters (2015), which entails two processes: agenda setting and problem definition, has in the effective institutional politicisation of problems.

2.3.1 Exploring reasons for soil neglect in public policy

According to several scholars, soils are not properly addressed in public policy in most countries of the world³⁵ (Bouma & McBratney, 2013; Ginzky et al., 2017; Howard & Lawson, 2015; Ingram & Morris, 2007; Juerges & Hansjürgens, 2018; Prager et al., 2011; Prager & Mckee, 2015; Wall & Six, 2015). Some reasons for governments’ neglect of soil protection in their agendas can be found in the complex nature of the social-ecological problem of human-induced soil degradation. Complex problems are considered a subcategory of public problems whose implications for public policy are nothing but challenging since they carry a set of particular characteristics (e.g., differences in knowledge, values, and interests, ill-defined goals and no agreement upon solutions, operation under uncertain scenarios, etc.) that makes them not amenable to technical rationality and positivist scientific methods (Ansell & Geyer, 2017, p. 159; Head, 2019). Consequently, when a problem is categorised as complex or “wicked”, it has consequences in terms of policymaking because “they may be kept off the policymaking agenda” (Peters & Tarpey, 2019, p. 234).

The complexity of the problem manifests itself in terms of the insidiousness of spatial and time scales, transboundary effects, external effects, interconnectedness to other environmental problems, diverse nature of actors, interests and values

³⁵ Few countries have created coherent legislation for soil protection, for example, China and Germany, while others have developed policies for protecting specific soil functions (Kibblewhite et al., 2012).

involved, fragmented approaches to degradation in policy and weaknesses in the current science-policy interface (Bouma & McBratney, 2013; FAO & ITPS, 2015; Juerges & Hansjürgens, 2018; Weigelt et al., 2015).

Bouma and McBratney (2013) argue that the phenomenon of soil degradation has an “unsettling, insidious and gradual nature” that challenges the framing of the problem in the societal and policy arena. These authors state that the insidiousness of soil degradation is a significant issue that can affect public perception because the effects of degradation are difficult to detect. Moreover, the visibility of such effects can be masked by the substitution of extra capital or labour (e.g., higher inputs of nutrients, tillage, and water) (Wyatt, 2008, p. 200). Soil change tends to be cumulative as a result of a series of relatively minor incidents (anthropogenic or natural) that occur in different places over time (e.g., wildfires produce extensive sediment yields over time scales of thousands of years causing erosion; soil contamination that results from diffuse sources such as atmospheric deposition of acidifying and eutrophying compounds or deposition of contaminants from flowing water or eroded soil). Furthermore, Bouma and McBratney observe that when single major disasters happen, e.g., critical landslides, the public and policy arena mobilises “for a short period, until, however, attention is diverted again” (2013, p. 133). In other words, communities and public institutions are compelled to act only when critical and irreversible thresholds have been surpassed (FAO, 2015b).

Spatial and time scales in soil management are a challenge for public policy because, as Juerges and Hansjürgens (2018) explain, the mismatch of soil degradation causes and soil-related policies can lead to failures in governance. The authors state that many policies targeting soil erosion mitigation focus on the farm level, assuming that changing farming practices will reduce erosion. This is not always the most effective intervention scale since socioeconomic factors causing erosion are not addressed in instruments targeting farmers (Pannell & Vanclay, 2011). In its place, they explain, soil erosion can result from climate change impacts or poor upstream water management practices (Juerges & Hansjürgens, 2018). Soils are a local resource, and some of their functions are localised while others are not

(Ehlers, 2017). Moreover, the degradation of soils may result in spatially disconnected effects, thereby becoming a transboundary issue (Weigelt et al., 2015) that affects the broader environment (e.g., polluted groundwater can transport contamination across countries).

There are also external consequences of soil degradation related to consumption patterns through which countries “use soils outside their territory” (Weigelt et al., 2015). External effects of soil degradation are particularly linked to the consumption of agricultural products (primary crops and processed products) by a different nation from the exporting producer. The “soil use footprint” of products refers to the amount of soil that is needed to produce such products. Due to the current shifting patterns of food consumption in developed and developing countries, and the continuous population increase in underdeveloped countries, larger amounts of land and soil are required to meet internal demands (Gerbens-Leenes & Nonhebel, 2002). Since suitable areas for growing crops are limited, nations make “virtual” use of soils to compensate for their scarcity. This “virtual” use of soil, as Weigelt et al. (2015) point out, should also be considered in soil governance to elicit the adverse effects of international trade on a nation’s soil that would otherwise be hidden.

Displaced land use can be analysed by the amount of virtual land imports of a country. According to Weigelt and colleagues (2015), for example, Japan displaces +170 million global hectares (gha) and the USA approximately +150 million gha, whereas China displaces -125 million gha and Brazil -123 million gha. Flasbarth (2017, p. 18) observes that in the case of Europe, virtual soil import is critical to the region because, as he states, “we need to use soils from abroad to maintain our standard of living and would not be able to produce the goods consumed internally on our own soils”. Moreover, he argues that another critical external effect that the region will have to regulate is soil and land-related activities by European citizens or businesses (like investments) in foreign countries to restrain negative impacts on the environment and local communities (Flasbarth, 2017).

The interconnectedness of soil to other major environmental problems implies that declines in soil quality will affect the loss of organic matter, soil fertility,

erosion, structural condition, changes in salinity, acidity or alkalinity, excess of chemicals, pollutants or flooding, and alters other ecosystems, which depend on soil functions. Understanding the nature of this interconnectedness and the consequences of actions taken at global, regional and national levels is crucial for effective soil policy and governance (FAO & ITPS, 2015).

Another critical issue is the diverse nature, interests and values of actors directly involved with soil degradation or the maintenance of soil health. An FAO and ITPS (2015) report indicates that a significant challenge for soil policy is dealing with a resource that is frequently privately owned and also a vital public good. This was one of the arguments presented against the implementation of the EU Soil Framework Directive – the first policy proposal at the European level to protect soils and promote the sustainability of soils functions in the region (Chen, 2019). As Montanarella (2015, p. 33) explains, some members of the EU (UK, France, The Netherlands, Germany and Austria) “noted that because most soils are privately owned, they should not fall under the remit of public governance”. Therefore, private property rights create tension in soil policy development, as they usually confer a full bundle of rights to landowners to freely decide how to manage their properties (Stankovics et al., 2020).

FAO and ITPS (2015) also highlight the disconnection between increasingly urbanised societies and the soil as contributing to the lack of visibility of soil-related issues. The widening gap between humans and nature has been studied in fields such as biodiversity, where, for example, Miller (2005) argues that the estrangement of the two worlds leads to failure in generating broad-based support for conservation because if people no longer value nature or regard it as relevant for their lives, they are more likely to lose interest in investing in its protection. Pyle (1993) refers to the “extinction of experience” as a phenomenon according to which the expansion of urbanisation and loss of local natural diversity ends in disaffection and apathy. As a result, “collective ignorance leads inexorably to collective indifference; and from there, it is not many more steps to ecological depreciation and collapse” (Pyle, 2002, p. 312). Soils are not only “difficult to sense” in our daily lives, but they also have, according to Engel-Di Mauro (2014, p. 3),

“become socially downplayed if not altogether suppressed from the everyday”, concealing social relations of appropriation and accumulation.

According to Prager (2010, p. 224), soil conservation issues and related agri-environmental policies “have historically been addressed separately from different disciplinary perspectives, which have often led to inadequate results because approaches were not sufficiently integrated, and gaps emerged”. Thus, soil governance for sustainable soil management is a highly compartmentalised and fragmented policy field that can contribute to inefficiency and inefficacies (Grunwald et al., 2017; Juerges & Hansjürgens, 2018). Soil conservation in the policy domain “requires a coherent approach that encompasses social systems as well as natural systems, because both may substantially affect institutional change and institutional performance” (Prager, 2010). According to Kibblewhite and colleagues (2012, p. 576), there are significant gaps in the science required to implement coherent legal frameworks to protect soil resources. For example, there are gaps in tools for estimating spatial risks to soil resources (including incomplete spatial data on soil properties and types as well as the absence of reliable models for some degradation processes), the definition of risk acceptability is incomplete and requires integration of biophysical and socio-economic perspectives, and the effects of land management changes across the landscape are somewhat uncertain. In this vein, FAO and ITPS (2015) state that the lack of ready access to the evidence needed for policy action is another factor contributing to policy failure.

Recently, the soil science community has acknowledged the need for inter- and trans-disciplinary approaches and collaborative learning processes with stakeholders to respond to the degradation of the world’s soil resources (Bouma & McBratney, 2013; Bouma & Montanarella, 2016; Keesstra et al., 2016; Koch et al., 2013; McBratney, Field, Morgan, et al., 2017; Weigelt et al., 2015). Soil research has been historically technical and science-centred in nature, paying little attention to the political and economic aspects of soil use (Howard & Lawson, 2015; Juerges & Hansjürgens, 2018). Within this context, an effort to “reach out from the soil box” (Bouma, 2015b) has been made with the emergence of the “soil security framework” (Koch et al., 2013), which I will address in the next chapter.

In synthesis, the complex features of soil degradation align with what Dovers (1996) has characterised as macro sustainability problems for policymaking. Specifically, he defines macro-problems as :

“multi-faceted, complex, fraught with uncertainties, spatially and temporally diffuse, highly connected to other issues, threatening major possible disruption of human and/or natural systems, and beyond the grasp of existing policy abilities. Their underlying causes are deeply embedded in patterns of production and consumption. Globally, examples include climate change, biodiversity loss, and growth in human populations and rates of resource consumption” (1997, p. 307).

Therefore, as Dovers claims, sustainability problems of this sort are very different from other policy problems, posing particular challenges for policy processes. Moreover, the complex features of soil degradation (spatial and time scales, irreversibility, interconnectivity, uncertainty and so forth), affect public perception of the seriousness of the problem. Various authors agree that the lack of public awareness and understanding of the critical contributions of soils to humans and ecosystems leads to deficiencies in soil governance (Grunwald et al., 2017; Juerges & Hansjürgens, 2018). For this reason, this thesis will pay particular attention to the ways in which the problem is socially constructed. It does so by focusing on which aspects are emphasised and marginalised in terms of soil political ontologies, power relationships and normative assumptions (these concepts will be distilled in Chapter 4).

2.3.2 A constructive approach to policy problems

As we have seen so far, soil degradation has not received proper political attention and action through coherent approaches at both national and global scales. When dealing with complex problems, the role of science is vital to inform policymakers,

communicate and raise awareness amongst the public³⁶ (Carter, 2003). And yet, regardless of the advances in the last two decades in scientific comprehension of the ecosystem services provided by soils, this has not been reflected in policymaking (McBratney, Field, Morgan, et al., 2017). This confirms what Buzan and colleagues (1998, p. 71) claimed decades ago when they wrote that “[o]ne of the most striking features of the environmental sector is the existence of two different agenda: a scientific agenda and a political agenda”. As they argue, both agendas might coincide and mutually influence, but they follow different rationales and objectives: one is built outside the realm of politics, follows academic standards and provides authoritative assessments about environmental problems, and the other one is part of the governmental activity and manages the development of those concerns in the public space determining “whether the presumed emergency is a political issue” (Buzan et al., 1998, p. 73). The political agenda reveals the degree of environmental problems’ politicisation in three ways: 1 – how much of the scientific agenda is recognised by policymakers, their electorates and the media, 2 – the acceptance of political responsibility for dealing with these issues, and 3 – the political management of problems of international cooperation and institutionalisation (e.g., regime formation, the efficacy of national initiatives, problems of enforcement, etc.) (Buzan et al., 1998, p. 72).

Processes of soils de/politicisation are a key issue for this research because the current ecological crisis demonstrated by the scientific community demands enhanced governance of human-soils relationships. Despite growing concern about a problematic situation upon which certain societal groups demand governmental intervention, not all public problems – objects of political controversy debatable within a political-administrative arena (Knoepfel et al., 2011) – will become subject to policymaking. The analysis of public problems and public policy pertains to the field of policy studies, which is comprised of two strands

³⁶ However, Carter (2003, p. 165) also claims that scientific knowledge is based on theories that can be contested and scientific evidence can be subject to different interpretations. Therefore, “scientific judgements will always be provisional and open to revision”.

(Peters & Zittoun, 2016): policy analysis and policy process studies. Policy analysis focuses on the study of policy by identifying the different elements that constitute a public policy (e.g., problems, causes and instruments) to understand connections between them or to other elements. Policy process studies seek to understand the dynamics of policymaking (e.g., agenda setting, decision making, policy formulation and policy change) and the factors that play a critical role in its development.

This dissertation uses insights from both strands of policy studies, but it is mainly concerned with the policy process to better understand practitioners' framings in the decision making of soil-related policies. According to Peters and Zittoun (2016), in policy process studies, much emphasis is placed on temporality and the role of context of the different types of practitioners (bureaucrats, politicians, scientists, citizens) of the different institutions, and of the different types of ideas and discourses. Before addressing how problems "come to be" in the policy process, I will focus on their connection to public policy, as this linkage has important ontological and epistemological implications.

According to Turnbull (2006, p. 4), public policy has been widely addressed in the policy sciences as "dealing with problems", a conception that goes back to Lasswell (1971) and that has not only imbued policy studies but also policymakers, who tend to "think of everyday policymaking in terms of problems and solutions". Thus, he argues that theorisations of public policy as "problem solving" prevail in the field of policy. One of the most widely recognised definitions of public policy (Howlett & Cashore, 2014; Peters & Zittoun, 2016) has been provided by Thomas Dye (1972, p. 2) as "anything a government chooses to do or not to do". According to Howlett and Cashore (2014, pp. 17-18), there are three central implications in this definition offered by Dye: 1. Governments are the primary agents of policymaking (though non-governmental actors may influence policymaking, governments have the "unique ability to make authoritative decisions on behalf of citizens"); 2. A public policy is a deliberate choice made by governments to undertake a course of action, and thus, a non-decision or decision to maintain the status quo "is just as much a policy decision as a choice to alter it"; and 3. It is a

conscious choice; therefore, unintended consequences of government actions are not public policy but an “unexpected by-product”.

However, as Howlett and Cashore (2014) argue, what is not clear from this definition is how policymakers come to such decisions. In their perspective, an improvement to Dye’s definition was put forward by Jenkins (1978, p. 15), who stated that a public policy is “a set of interrelated decisions taken by a political actor or group of actors concerning the selection of goals and the means of achieving them within a specified situation where these decisions should, in principle, be within the power of those actors to achieve”.

This concept brings new elements into consideration (Howlett & Cashore, 2014; Turgeon & Savard, 2012). In the first place, it specifies the dynamic and interdependent process of decision making, recognising the complex nature of diverse actors involved in the process and the necessity for their coordination. It also emphasises the content of a policy as achieving a goal and identifying the means to reach it. Though this definition does not specify anything about the process of selection, as has been observed by Howlett and Cashore (2014, p. 19), considering a policy as the search for conscious goals nevertheless underlines the significance of ideas and knowledge held by policy actors that “shape their understanding of policy problems and the ‘appropriateness’ of potential solutions to them”. Finally, it introduces the notion of government “capacity” as a limitation on the types of actions it can consider in a specific context.

Though no definition of public policy has been imposed in the field of policy studies (Zittoun, 2014), and there are as many definitions as authors (Peters & Zittoun, 2016), I will highlight from the two presented above three important considerations for this research:

- 1) Public policy concerns the government’s choices to transform or maintain the status quo.
- 2) Those choices are context specific.
- 3) More importantly, those choices are political, and in that process of selection amongst courses of action, policymakers play a key role in defending certain worldviews, interests, and values.

Peters and Zittoun (2016, p. 4) argue that despite this diversity, the fundamental question when defining policy is “the extent to which it is an empirically defined phenomenon versus one that is more constructed by political and social processes”. Addressing public policy and, for that matter, public problems requires an ontological and epistemological stance about how social phenomena are perceived and approached by the researcher.

Ontological considerations

Ontological considerations must necessarily come first because the study of public policy and institutional change is inherently embedded in the postmodern structure-agent debate within the social sciences. Though considering this broader historical discussion is beyond the scope of this literature review, it is important to mention, in a nutshell, that the essence of this debate is whether the emphasis of change (social and political causality) is put on the political *context* (structure) or on the political *conduct or action* (agency), influencing most characterisations of public policy provided by scholars. The agency-structure debate has given birth to two main traditions in policy studies: institutionalism and voluntarism/intentionalism.

The institutionalist rationale, which has been rather prolific in this discipline, considers individuals as embedded in institutions (Peters, 2016) – but according to some theorists, able to influence or transform them (Vatn, 2007). Amongst the various epistemological approaches within institutionalist theory – namely normative, rational choice, historical, and discursive – there are, according to Peters (2016), three common aspects to all of them:

- 1) The capacity of institutions to create predictability.
- 2) The capacity of institutions to reproduce themselves over time.
- 3) The assumption that there is some separation of the institution from its environment in terms of its autonomy to pursue its own goals.

On the other hand, voluntarism/intentionalism analyses the social and political world from the participants’ perspective, explaining political outcomes through the intentions of the actors directly implicated in a political process. As

Hay (2002, p. 110) expresses, intentionalism is rich in description but poor in explanatory capacity, and thus, “is perhaps best seen as a tendency present in certain modes of analysis rather than as a distinct and clearly defended position in its own right”.

From this discussion, I agree with the ontological position taken by constructivists who acknowledge the necessity to move beyond this dichotomy and understand social and political change as the result of a complex *relationship* between structure and agency (Hay, 2002). As recognised by Peters (2016), individuals and institutions are part of the complex policymaking system in which they are mutually affected, as well as by other institutions and socioeconomic pressures. Therefore, his conceptualisation of public policy appears rather appropriate in overcoming this tight binary discussion. In his words:

“Public policies represent the choices made by governments and their allies – interest groups, not-for-profit organizations, and so forth – and therefore are the products of decisions made by numerous individuals. But those individuals interact within formal structures, and they interact according to the rules that govern those structures” (Peters, 2016, p. 57).

Moreover, confronted with the debate about the role of material (realm of matter) and ideational (realm of ideas) factors in shaping policy dynamics, constructivism takes a relativist position based on the assumption “that we cannot hope to understand political behaviour without understanding the ideas actors hold about the environment in which they find themselves” (Hay, 2002, p. 4). According to Hay (2002), under this perspective, political outcomes are the result of a complex interaction between the material and the ideational and for that reason, we need to be sensitive to ideas, perceptions, and beliefs and to the ways in which they interact with institutions and the material world. Furthermore, Marsh and Hall (2016, p. 127) state that “[b]y focusing on the complex relationships between ideas and the material context we can illuminate the interactive, iterative, and reciprocal dimensions” involved in policy processes.

Therefore, two relevant conclusions follow from these debates: first, to acknowledge the importance that individuals, as well as institutions, have in promoting social and policy change. Not all is determined by context nor by agency, so it is necessary to consider both when studying public policy. Second, meanings and interpretations of the material world have a key role in policy processes. Meanings, as West (2016) claims, are not just a layer added to social-ecological relations, but they rather contribute to their constitution and shape. In this dissertation, public problems, and more importantly, policy problems, are regarded as collective constructions³⁷ permeated by the experience, values, judgements, and worldviews of those involved in a certain socio-historical context. Thus, my ontological stance distances itself from radical constructivism (Von Glasersfeld, 1995)³⁸ and gets closer to what Arias-Maldonado (2011, 2019) has proposed as “material constructivism”. In light of the increasing critiques towards constructivism, particularly since the emergence of the “material turn” in social sciences, Arias-Maldonado (2019, p. 60) proposes the integration of the social-natural dimension so this theory can “become credible”. As he puts it:

“In other words, a material version of constructivism is to be developed: the recognition of the fact that any social construction of nature is first and foremost a material reconstruction of nature, a process which, of course, is conditioned in turn by cultural representations of nature. Through this

³⁷ Constructivism and constructionism are two different strands of the Constructive Theory (Sommers-Flanagan & Sommers-Flanagan, 2018). Though the difference is subtle, it is worth noting: while the former assumes that social phenomena are constructed in the individual mind through cognitive processes, the latter affirms that they are constructed through interactive and rhetorical processes with others (Young & Collin, 2004). I believe that both approaches are complementary. Thus, rather than choosing between one or the other, it is more beneficial to assume a general position, resting upon both approaches’ central tenet: the contention that social phenomena and meaning are indeterminate and subjective. Such a position is condensed by Crotty (1998): “all knowledge, and therefore all meaningful reality as such, is contingent upon human practices, being constructed in and out of the interaction between human beings and their world and developed and transmitted within an essentially social context”. That said, for pragmatic reasons, in this dissertation, I will use the expression constructivism.

³⁸ Radical constructivism considers that there is only one available world to each individual, constructed and organised by her own subjective experience. This radical position leads to an ethical disengagement: since any claim is based on the purely subjective, then there is no possibility for comparison or judgement (D’Agnese, 2015).

process, nature is transformed into human environment, so that it can be said to be a hybrid in at least two senses: as the Latourian quasi-object, where matter and ideas merge, and as a product of the complex process of hybridization that results in new socio-natural forms” (2019, p. 60).

Although new materialist approaches provide a critical standpoint to the way we engage with the biophysical world, being respectful to material otherness, they fail to account for the damaging effects of human agency. A fully-fledged explanation of this literature exceeds the aim of this section. What is relevant to my work is that this movement seeks to overcome the realist-constructivist (or nature-culture) dichotomy by contending that materiality is “intrinsically active”, that is, with agentic capacity (Gamble et al., 2019). According to Arias-Maldonado, the distributed agency that the material turn provides to all entities, though assertive – matter is not inert or dead – fails to recognise that “human actors possess more influence than others” (2016, 2019, p. 62). Consequently, he argues that this assumption has consequences in terms of normative action and enacting environmental policy. In a related vein, Pellizzoni (2016) argues that this literature weakens social sciences’ critical capacity since it tends to depoliticise the existing order of things by not engaging critically with social life. Therefore, constructivism still provides an advantageous position to address environmental politics, accounting for human intentionality and its harmful effects.

Epistemological considerations

My second observation is about the epistemological constructivist/interpretive approach I apply in this research to the analysis of environmental problems. Until today the conception of public policy as problem solving associated with the technical rationality of “scientism”, “technocracy”, and “expertism” (Enserink et al., 2013) prevails in policy studies (Ansell & Geyer, 2017; Fischer & Gottweis, 2012; Peters, 2015; Turnbull, 2006). On this matter, Zittoun (2014) states that the positivist literature on public policy that regards it as an impartial object “remains illusory”. In response to the predominance of positivism in policy studies, a robust

body of critique has been developing since the 1970s. Critics can be grouped in two streams: those concerned with the prevalence of positivism in policy studies (especially in policy analysis), and those confronting rational-linear models of empirical policymaking.

Durning (1999) explains that the practice of positivist policy analysis – or “mainstream analysis” in terms of Drzyek (1990) and Fischer (1990) – has been an object of criticism due to the poor comprehension of complex issues and the presumption that the knowledge that matters is the one held by people who can employ sophisticated quantitative methods. In a related vein, in her seminal work “Political Paradox”, Deborah Stone (1988) criticises the “rational project” of policy analysis because it assumes policymaking is artificially made outside the political contest, hiding the effects of framing that benefit some interests at the expense of others. The body of critique that emerged during the 1980s and 1990s towards the positivist rationale in public policy gave birth to what is known as the “argumentative turn” in policy analysis (Fischer & Forester, 1993). Two key contributions to the emergence of this approach were the works of Stone (1988) and Majone (1989).

To Stone (1988, p. 385), politics is a “process of argument and persuasion” that involves looking for criteria and justifying choices. Subsequently, she argues that policy analysis is always a type of argument that includes some elements and excludes others and, therefore, carries a particular point of view. Similarly, Majone (1989) affirms in his book “Evidence, Argument, and Persuasion in the Policy Process” that argument is “central in all stages of the policy process”, and it is through the process of argumentation that knowledge, expertise, interests, values and moral judgements from citizens and policymakers are mobilised to make public policy choices.

The argumentative turn (also referred to as the discursive or linguistic turn)³⁹ initially had an important influence in policy studies by focusing on the analysis of

³⁹ New alternatives of policy analysis converged under the argumentative turn, such as participatory policy analysis (De Leon, 1990, 1992; Durning, 1993; Mayer, 1997; Van Der Meer & Edelenbos, 2006);

problem definition and agenda setting, yet this perspective will expand to a broader reflection on the need to take into consideration the significance of argumentation in the policy process – including policy inquiry and policymaking (Deubel, 2007). The argumentative turn falls into the constructive/interpretive paradigm of social research that seeks to understand “the complex world of lived experience from the point of view of those who live it” (Schwandt, 1994, p. 221). This paradigm aims to explore meanings and comprehend the connections between language and material policy processes. It is interested in knowing how agents perceive the environments where they make decisions and how they reproduce or challenge that institutional setting. As Lejano (2015, p. 379) explains, “[t]he reason interpretivists try to dig into the issue of meaning is that we need to understand how things are understood before we can explain the outcomes of policymaking”. According to Fischer and Forester (1993), using argumentation in policy analysis has a series of implications: it helps to visualise how practitioners formulate and construct problems by using different languages, discourses and frames, and also how policy analysis and planning is a complex exercise of agenda setting power (focusing selectively and deliberately on some alternatives and discarding others). All things considered, the constructivist/interpretative paradigm is appropriate for the study of complex sustainability problems because it is more sensitive to the messiness of policymaking and to what policymakers actually do in their processes of decision making (Arrona, 2017). This approach acknowledges that analysis is value-laden and recognises that knowledge and policy are co-constructed and there is no separation of facts from value and context, as is suggested by “evidence-based” policymaking (Denzin, 2009).

critical policy discourse (Gottweis, 2003; Hajer, 1995; Van Dijk, 1993); interpretive (Wagenaar, 2014; Yanow, 1999); narrative (Roe, 1994; Stone, 1989); frame (Rein & Schön, 1996; Schön & Rein, 1994); and, discursive (Dryzek, 1990; Hajer, 1995; Schmidt, 2010) analyses, among others. A key tenet to all of these is how linguistic constructions are used to portray and characterise reality, placing more emphasis on some parts to the detriment of others (Fischer & Gottweis, 2012)

Table 2. 2 Summary table: epistemological approaches to policy analysis and policymaking

	Rationalist Positivist	Non-rationalist Constructive/Interpretive
Assumptions	<p>There is a single, measurable reality</p> <p>Truth is achievable</p> <p>Objectivist</p> <p>Dualism between the external and individual world</p>	<p>There is no single reality or truth</p> <p>Reality and truth are always context dependent.</p> <p>Subjective, relativism</p> <p>Relationality between the external and individual world</p>
View on problems	<p>Knowledgeable</p> <p>Linear, soluble</p>	<p>Constructed-interpreted</p> <p>Complex, adaptive</p>
Policy analysis	<p>Value-neutral</p> <p>Scientific linear reasoning</p> <p>Problem-driven</p> <p>Inquiry is undertaken in a prescribed manner following a series of well-defined steps</p> <p>Analysis follows a fixed sequence</p> <p>The goal is to predict what is best based on objectives, alternatives, and consequences.</p>	<p>Value-laden</p> <p>Reasoning is by metaphor and analogy</p> <p>Inquiry is nonlinear, one starts where one can and goes where sense can be made</p> <p>Analysis must include multiple understandings or perspectives</p> <p>The goal is to include diversity and recognition of power to lead to better understanding in selecting the 'best fit' within the context.</p>
Policymaking	<p>Technocratic model: policymakers change their preferences and adapt their goals to new conditions.</p> <p>Policy decisions are based on objectivity, precision, linearity, and determinant rules.</p> <p>Policy decisions are made by selecting from alternatives and minimizing objections.</p>	<p>Political model: policy development is the result of changes in the configuration of dominant interests. Context will determine the selection and success of a policy.</p> <p>Policy decisions are based on power and politics.</p> <p>Policy decisions are made with clarity and reason but in a more fluid and iterative manner.</p>

Source: Adapted from O'Connor and Netting, 2011.

A summary of the non-rationalist approaches that permeated policy analysis and policymaking compared to rationalist ones is offered in table 2.2 above. In the 70s and 80s widespread frameworks of linear-rational-technical policymaking in the public sector became increasingly questioned. These critiques recognise the contingent nature of policymaking where decision makers do not always act in a certain and purposeful manner with full knowledge of information (and consequences); thus, the instrumental rationality posed to actions by the rational model may not always exist (Yanow, 1996, p. 23). Two strands of critique of the “rationality project” are particularly significant for this research: critiques of the rational approach to public problems as “solvable” and critiques of the linear logic of policymaking as problem solving.

In regard to the positivist approach to problems, Head and Alford (2015) grouped critiques into three streams. The first stream of criticism came from systems theory (Ackoff, 1974), according to which problems in the economic and social systems are interrelated – a “system of problems” – and, therefore, cannot be treated in isolation. A second stream emerged amongst scholars in the fields of social policy and education, to whom problems are rooted in values that the scientific rationale neglects (Rein, 1976; Schön & Rein, 1994). Practical and experiential knowledge of those real living problems could not be substituted by technical rationality; difficult policy problems are the result of competing values rather than gaps in expert knowledge. The third stream of critique, “the most trenchant” (Head & Alford, 2015), originated in the field of planning and design, with Rittel and Weber’s seminal work “Dilemmas in a General Theory of Planning” (1973).

Rittel and Weber (1973) introduced a profound change in the way “difficult” public problems (a category usually adjudicated to environmental problems) are understood in the policy arena. The concept of wicked problems (Churchman, 1967; Rittel & Weber, 1973) challenged the idea of “planning” and “efficiency” in the public sector by stating that public problems are inherently wicked, incomprehensible and resistant to solutions (Head & Alford, 2015). In contrast to tame problems (e.g., engineering, mathematical) that appear in closed systems,

wicked problems occur in open systems, “making them hard to contain, define or bound” (Ansell & Bartenberger, 2017, p. 109).

The concept of “wicked problems” has been the object of much debate, some pointing at the idea that it seems to be dealing with “lost causes” (Head & Alford, 2015) that limit or prevent political action (Peters & Tarpey, 2019). In response, new formulations to advance the comprehension and treatment of uncertain, difficult problems have emerged, such as messes (Ackoff, 1974; Roe, 2013), ill-structured (Dunn, 1988; Mason & Mitroff, 1981; Simon, 1973), unstructured (Hisschemöller & Hoppe, 1996), complex (Ansell & Geyer, 2017), superwicked (Levin et al., 2009, 2012), wickedness (Head & Alford, 2015), and problematicity (Turnbull & Hoppe, 2018). Despite criticisms and reformulations, the legacy of Rittel and Weber is to problematise the relationship between knowledge and power in policy responses to contested social issues (Head, 2019). Policy problems, especially in complex areas such as that of environmental degradation, are problematic and of variable meaning. Thus, treating complex sustainability problems requires careful reflection based on the experience and knowledge of relevant stakeholders and policymakers about their perceptions of the nature of the problem because differences among them may obstruct progress in the policy process (Head, 2019).

Another strand of critique towards the rationalist model of policymaking focuses on the linear rationale of problem solving, as a set of clear and sequential stages, “almost as if on assembly line”, thus it cannot explain, for example, why sometimes policy solutions (such as deregulation) go looking for problems (Stone, 1988). Turnbull (2006) identifies a series of conceptual weaknesses in this model. Firstly, it assumes a linearity between problems and solutions because the meaning of problems is clearly defined, and thus, it is just a matter of analysing which is the best solution. But as he discusses, “policymaking does not often solve its problems in the manner of scientific, apodictic solutions” (Turnbull, 2006, p. 4). The incrementalism theory of policymaking claims that policy solutions usually introduce gradual, often partial and small changes to the existing situation. Lindblom (1959), the proponent of incrementalism, suggests that policymaking is not a rational process but rather a process of “muddling through”.

Second, the scientific model of problem-solving treats problems analytically, where hypothetical solutions are answers to finite, known, stable problems. As a result, this model shifts the focus from debating the meaning of the problem to confirming the solution (Turnbull, 2006). Therefore, Turnbull proceeds to argue that “since we cannot always clearly define social problems in practice, much thinking occurs around understanding the problem itself” rather than confirming the solution (2006, p. 6). For these reasons, he claims that problem-setting is as important as problem solving; moreover, he states it should be the quintessence of policymaking. Problem setting is key because, as Rein and Schön stated, “the questions we ask shape the answers we get” (1977, p. 236).

Therefore, based on a non-rational epistemology, I understand public policy and the process of policymaking as a matter of contextual interpretation of meanings (Fischer & Gottweis, 2012; Zittoun, 2014). As explained by Finnemore and Sikkink (2001), constructionism in policy studies focuses “on the role of ideas, norms, knowledge, culture, and arguments in politics, stressing, in particular, the role of collectively held or “inter-subjective” ideas and understandings of social life” (Finnemore & Sikkink, 2001). Nevertheless, assuming a constructive/interpretive epistemology in analysing problems does not imply denying their material, “natural” attributes. As Scoones et al. (2013, p. 470) point out, “[r]ealities out there are just as real; they just get interpreted in different ways”.

Interpretive approaches are relevant for environmental issues because, as argued by Dryzek (2013), through discourses, not only do we define issues, but we also determine the way in which they are going to be addressed. Following his take on discourse analysis, I also agree that interpretive methods should not be regarded as necessarily taking an “extreme postmodern position” that treats nature as a “subcategory of culture”, which is, in his terms, “an arrogance that fails to recognize nature’s existence prior to human appropriation” (2013, p. 12). As he argues (and in resonance with Arias-Maldonado’s argument for *material constructivism* explained in the previous section), the mere fact that something could be analytically interpreted does not make it less real, and yet, the different ways in which people understand and interrelate to social as well as environmental

phenomena provide the terrain for contestation, conflict and competition, and that is what political arenas are made of.

The aim is thus to interpret how attributes related to soil degradation are represented and explained by relevant policy actors because the way in which a problem is perceived and understood has consequences in the way in which it is enacted in policy and management practices (Turnhout et al., 2013).

2.3.3 Politicising public problems: a policy process perspective

Despite the public nature of environmental problems, not all turn into active matters of policymaking. Considering “policy problems” requires addressing the question of what turns a problem into a policy problem (Ansell & Geyer, 2017), demanding political action by political parties, interest groups and even actors in government – especially public bureaucracy (Peters, 2015). Whether governments decide to act based on public opinion, the severity of the problem or the pressure of the media (Wolfe et al., 2013), the key point is that an issue has to be framed in such a way that is devoid of inevitability and moved to the realm of human agency (Hay, 2007; Stone, 1989). Furthermore, dispersed information, concerns, judgements and values have to be organised into a graspable, coherent pattern (Rein and Schön, 1993, 1996), determining causality and assigning the associated political responsibility (Zittoun, 2016). As Coffey (2019, pp. 567–568) argues, environmental policy analysis has to be attentive to causal stories “because of the way in which they focus attention and enable and constrain the possibilities for taking action”. These processes of conversion of public concerns into policy problems are mediated by cognitive frames and framing processes, where language and information are used purposefully to gain support for a cause (Saurugger, 2016; Stone, 1989). Conversely, such discursive devices can be used to exclude a problem from the agenda when the proposed frames are not aligned with the interests of powerful groups (Bachrach & Baratz, 1962).

To better understand how public issues become subjects of the political process, it is important to draw our attention to what Peters (2015) defines as the “model of causation” in the design of public policy. According to Peters, the policy

design process entails three “models” or stages: the model of causation, the model of intervention and the model of evaluation (Figure 2.4). Governmental intervention requires succeeding in the causation model – by bringing attention to gain support to the cause (i.e., *agenda setting*) and by explicitly explaining the causes and dynamics producing the problem and approaches for action (i.e., *problem definition*).

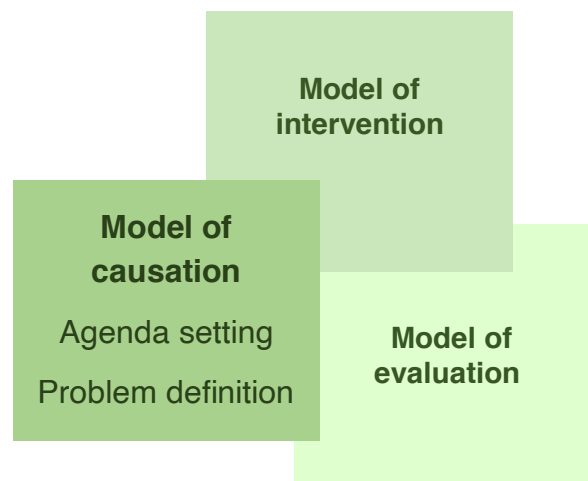


Figure 2. 4 Peters’ design framework for public policy.

Source: This research based on Peters, 2015.

[Agenda setting: the politics of attention](#)

The question of why governments decide to focus attention on certain matters has been largely addressed in the public policy agenda setting literature (Bacchi, 2009a; Baumgartner & Jones, 1993; Cobb & Elder, 1971; Kingdon, 1984; Rochefort & Cobb, 1993). Nevertheless, it must be noted that this relationship is not straightforward and how problems come to public attention is more of a “black box” (Stone, 1989). An agenda has been defined as “a collection of problems; understandings of causes, symbols, solutions, and other elements of public problems that come to the attention of members of the public and their governmental officials” (Birkland, 2005, p. 170). Agenda setting is a process by which different issues compete to gain a place on the policy agenda, which is limited by time, resources and attention. As

Wolfe et al. (2013, p. 179) put it, “it is fundamentally about the *politics of attention* and *attention dynamics* at the level of the political system” [emphasis added].

Zahariadis (2016) proposed a model for analysing agenda setting entailing four key variables (“4 Ps model”): power, perception, potency and proximity. According to the author, power is the principal factor in agenda setting. By exercising power, actors raise attention to some issues and discard others. Through persuasion and argument, the use of material and emotional resources, “they challenge or reinforce deeply held beliefs about the nature of policy problems and appropriate solutions” (Cairney & Zahariadis, 2016, p. 89). Power is deeply related to knowledge. As Contrandriopoulos and colleagues (2010, p. 459) outline, knowledge plays a central role in the processes “by which issues are problematized, conceptualized, and prioritized”. The authors identify three types of actors in the continuum of knowledge exchange in the policy arena: those who work in socially legitimate knowledge production institutions and systems (for this research *experts*), those who hold institutionally and socially sanctioned positions (for this research *policymakers*), and those who are in between, the intermediaries (for this research *policy entrepreneurs*). The position of actors in the processes of agenda setting (as well as problem definition) is related to what Carol Weiss (1983) defined as the “three I’s forces”: ideology, interests and information. Weiss argued that positions taken by policy actors in the policy arena result from the combination of these three sets of forces which interact with one another to determine policy actors’ stance in policymaking. When groups of actors engage in discussions and negotiations in the policy arena, other forces intervene (e.g., hierarchy, specialization and internal division of labour, fragmentation of issues, control of information sources, etc.). But as she argues, “the content of each group’s policy positions, as these are advanced initially and modified in the course of negotiations, is based on the interplay of ideology, interests, and information as the group interprets them” (1983, p. 221).

According to Zahariadis’ model, perception, the second factor in shaping the agenda, is key because though many problems justify political attention at any given time, only a few turn into policy problems. Potency is related to the gravity

of the consequences of a certain problem; the more severe or salient the problem becomes, the more likely it will receive attention. Proximity refers to the distance of impacts on peoples' own lives; the closer a problem becomes, the more likely it will shape their attention. Zahariadis (2016) affirms that in a certain institutional setting, "power configurations and perceptual bias colour the placement of issues and their movement across agendas", whereas proximity and potency are "filtered through power and perception", affecting the agenda indirectly. The author concludes that all processes of agenda setting involve relationships amongst the four Ps, though they may include more variables and complementary relationships to the process.

Kingdon's (1984) Multiple Streams Approach (MSA) is a fundamental reference in the agenda setting literature to explain policy change. According to the MSA, a "window of opportunity" opens in the policy system at a moment when three streams converge: problem, policy and political. In the problem stream, attention to a certain issue or event increases (due to "focusing events" such as environmental disasters), recognising the existence of a pressing problem. In the policy stream, which comprises policy communities of specialists, ideas and proposals around the problem are developed and scrutinised according to specific criteria; the surviving ones are then diffused in the community as the best available solutions to the problem. In the political stream, interest groups are the driving forces advocating a particular policy change. When these three streams couple, a policy window opens for a short period of time, and as Kingdon acknowledges, if the opportunity passes without action, it may not reopen for a long time. There are problem windows (emergence of a pressing problem) and political windows (search for proposals that would serve politicians' interests). Thus, problems and politics can build the government agenda, but the probability of rising to the decision agenda increases drastically if the three streams converge.

In the MSA, the role of “policy entrepreneurs”⁴⁰ – actors inside and outside government who are willing to invest their resources (time, energy, reputation, and even money) – is fundamental to advancing the opening of these windows and pushing their proposals for policy change; they are the “surfers waiting for the big wave” (Kingdon, 1984). Zahariadis (2016, p. 12) observed that the concept of policy entrepreneur is Kingdon’s most important contribution to agenda setting literature “because it gives an element of agency to models that had previously been more structural in orientation”. He argues that agenda setting is essentially an “actor-based process”, although it cannot be separated from context. According to Mintrou and Norman (2009), policy entrepreneurship comprises four elements: social acuity (perceptiveness to engage others in policy conversations and understand their worldviews within their political context); defining problems and advocating solutions; building teams (promoting and maintaining advocacy coalitions); and leading by example.

As Zittoun (2016) points out, not even tragic events affecting society are public problems by themselves. They need to be defined as such by policy actors “by getting rid of its singularity, establishing causality, transforming it into a reproducible event and associating it with the political responsibility of the government responsible for solving it” (Zittoun, 2016, p. 254). The question is thus, how ideational factors such as worldviews, values, collective understandings, mental models, and so on, govern political action or inaction; this means that interests and the following policies are not exogenously given (as in rational choice theory) but formed in a particular framework of meaning (Saurugger, 2016).

Problem definition: the making of a policy problem

Decision making is hardly a rational process (Rochefort & Cobb, 1993). The analysis of alternative models to explain decision making has given birth to the study of

⁴⁰ Contandriopoulos et al. (2010) identify various kinds of intermediaries in the policy arena contributing to flows of information, e.g., *conveyors* (Havelock, 1979), *brokers* (Weiss, 1977), *intermediaries* (Huberman, 1994) or *lobbyists* (Milbrath, 1960).

“problem definition”. Hogwood and Gunn (1984, p. 109) defined it as the process by which an issue (problem, opportunity, or trend), having been identified, is “further explored, articulated, and possibly quantified; and in some but not all cases, given an authoritative or at least provisionally acceptable definition in terms of its likely causes, components, and consequences”. Veselý (2007) argues that scholars have used a variety of terminologies and approaches to refer to the study of problem definition, such as “problem structuring”, “problem modelling”, and “problem processing”. Moreover, he argues that problem definition is either understood in literature as an analysis of how issues are actually defined or as recommendations on how they should be defined (Veselý, 2007).

As has already been argued, from a constructivist perspective, problems are not objective “givens” but social and cultural constructs; “they are matters of interpretation and social definition” (Elder & Cobb, 1983, p. 172). Policy problems are, in the opinion of Turnbull and Hoppe (2018, p. 12), active definitions “by opinionated and committed policy actors, to be used in a process of claims-making to persuade others”. In recent years, many scholars have dedicated special attention to the connection of policy problems to policy design (Bacchi, 2009a; Head, 2008; Head & Alford, 2015; Hoornbeek & Peters, 2017; Hoppe, 2010; Peters, 2005; Peters & Rava, 2017; Rein, 2006; Roe, 2013). Scholars within this field have described the individual characteristics of policy problems as key elements for their identification, formulation, and their likelihood to feature prominently in the policy agenda of governmental actors (Ansell & Geyer, 2017). Three strands of scholarly literature can be identified: the first one focuses primarily on understanding the attributes of problems (Hoornbeek & Peters, 2017; Hoppe, 2002, 2018; Peters, 2005), the second deals with the treatment of “wicked problems” (Head, 2008, 2019; Head & Alford, 2015), and a third strand focuses on problem construction or “problem framing” for entering political systems (Bacchi, 2009a; Veselý, 2007).

For Hoornbeek and Peters (2017), many of these approaches to problem definition follow an objectivist perspective (problems are real and have relatively unambiguous characteristics). However, as Peters (2005) argued, the alternative

approach to policy problems offered by constructivists “has done a useful service in pointing to the politics involved in problem definition”. As he later discussed, the definition of policy problems is grounded on an ideological stance of whether the government should intervene or not in the economy and society, and thus, policy actors “tend to think of policy problems in terms of their own interests and their policy priorities” (Peters, 2015).

Vesely’s (2007) “problem delimitation approach” (synthesised in Table 2. 3 below) is a critical contribution to surpassing the conceptual fuzziness in the field of problem definition by distinguishing two lines of analysis that he coined as the “political stream” and the “policy stream”.

Table 2. 3 Vesely’s “problem delimitation” approach

Stream	Basic aim	Activities	Research focus
Political stream	To understand how and why certain societal conditions become defined as public problems and what are consequences of different problem formulations (definitions)	Analysis of politics of problem definition	To <i>analyse</i> objective conditions underlying the problem, subjective interpretation and framing of the problem and interrelations between subjective and objective side over time (dynamic approach)
Policy stream	To formulate public issues as policy problems so that they are well informed by stances of different actors involved, and quantitative data available and they fulfil other criteria (such as solvability by public policy instruments)	Problem structuring Problem definition Problem modelling	To <i>formulate</i> public issues as policy problems so that they are well informed by stances of different actors involved, quantitative data available and they fulfil other criteria (such as solvability by public policy instruments).

Source: Vesely, 2007, pp. 89 and 98

The *political stream* seeks to understand how specific public issues are “identified, conceptualized and defined by different actors, why certain societal conditions become defined as public problems (and others do not) and what are the reasons and consequences of different definitions or frames of public issues” (Veselý, 2007, p. 88). Scholars contributing to this approach are, for example, Dery (1984), Rochefort and Cobb (1993), Stone (1988) and Peters (2005). This stream is what Peters (2015) refers to as the “politics of problem definition”, and its objective is, according to Veselý (2007), to describe and explain different frames of public issues. For authors of this stream, the inquiry is focused on argumentation, on the rhetoric used by “problem definers”, and analysis of the context that enables those definitions because for any problem, there are different perceptions of its cause, impact, and significance. As Veselý observes, these scholars understand problem definition and political disputes over a problem as a social construction, and thus they try to analyse the different formulations made by policy actors over time (the “career” of the problem).

The *policy stream* “is more practical and aims at providing precise formulation of public problems so that the problem can be effectively and efficiently solved” (Veselý, 2007, p. 88). Though under this stream, it is also important to analyse subjective definitions of problems, the main goal is to find solutions for public problems through the precise formulation of the problem. Therefore, scholars of this stream are concerned with methods of problem formulation. The basic concern is, according to Veselý: “which methods to use, and how, when formulating policy issues for policymakers?” (2007, p. 88). By problem formulation, he understands the transition from an unstructured to a structured problem in a way in which the nature of the problem is specified in a few sentences or as a graphic model. To Veselý (2007), the formulation builds on three sources of information: 1. subjective views and frames of a problem; 2. expert opinion on whether it is or is not a problem; and 3. empirical information.

In summary, focusing on the use of language, on “the construction of frames of reference on which policymaking is based”, according to constructivist approaches, is a way to understand why some issues become the subject of policymaking or are

excluded from it (Saurugger, 2016, p. 132). For that to occur, we need to understand the career of a public problem (Gusfield, 1984), how its definition has evolved and what are the current conditions to be set in the institutional agenda (Zittoun, 2016).

2.3.4 Conclusions

In this section, I explored the policy challenge, which translates as a lack of attention and action of governments in developing and implementing coherent soil protection frameworks. First, I addressed this challenge by presenting a series of factors that describe the complex nature of the problem. Then, I introduced theoretical perspectives from policy studies to understand what turns a problem into a policy problem. This is referred to as the process of politicisation through which an issue becomes a subject of political action. Departing from a constructivist/interpretive stance to social phenomena, I explained how ideas, perceptions, worldviews, and cognitive frames have a critical role in this process of politicisation. In order to understand how a problem turns into a policy problem, I focused on the “model of causation” (Peters, 2015) in policy design, which comprises two processes: agenda setting and problem definition. Though they have different features, they are interwoven and the success of a problem becoming a policy problem depends on thriving in both stages (by moving from the realm of fate to the realm of human agency and defining it as a problem that requires governmental intervention).

The agenda setting literature reveals that the power and perception of policymakers, experts and policy entrepreneurs are the most important factors for politicising problems. Power reflects actors’ positions in the process of agenda setting (as well as problem definition) and is based on their ideology, interests and information. Exogenous factors influencing the agenda are, for example, focused events (e.g., disruptive ecological crises such as dust storms) that could lead to the opening of “windows of opportunity”. On the other hand, the perspective of the politics of problem definition reveals that the stories we tell will influence whether a public concern will become politicised or depoliticised. The “political stream” of problem definition helps to understand how different actors identify,

conceptualise, and interpret a problem. These are the “framings” of the problem that serve to interrelate the subjective and the objective.

2.4 Synthesis of the literature review

From the critical review of the literature, I have identified that: a) soils are vital for life on Earth, and since we are currently living in an ecological crisis with one-third of the world’s soil resources degraded, urgent action is required; b) at the international level the global governance of soils is rather weak despite recent initiatives. We are still lacking a legally binding instrument to protect global soil resources; moreover, soils have not been explicitly addressed in the SDGs and are usually overlooked in environmental reports; c) at national/state level, soils remain neglected in governmental agendas, most jurisdictions lack coherent policy frameworks for soil protection, and soil issues are usually addressed indirectly (e.g., agriculture, water, biodiversity, mining, etc.) and in a fragmented way (focusing on specific soil functions or processes); d) in order to turn a public concern into a policy problem (to become politicised) it has to thrive in two interwoven process: the problem definition and the agenda setting (model of causation in policy design); e) the way in which the problem is “framed”, the narrative constructed to explain the (causal) soil degradation story is related to the success/failure of soils moving into or being blocked from the institutional agenda; f) overall, there is a lack of awareness not only about the critical role of our “silent ally” in supporting the Earth system, but about the severe rates of soil degradation, which could be alleviated with more sustainable management practices.

Chapter 3

What is the role of soil framings in setting the agenda?

The examination of the literature in Chapter 2 reveals that soils are a low priority to many jurisdictions around the world. Therefore, to avoid the amplification of ongoing soil degradation processes, a political challenge to contemporary societies is to render this matter of concern into a policy problem (Díaz et al., 2019; FAO et al., 2020; FAO & ITPS, 2015; IPCC, 2019; Scholes et al., 2018). A recent effort from the soil science community to create awareness is the development of the *soil security* concept (Koch et al., 2012, 2013). Soil security intends to put soils on the political agenda by emphasising their critical value to six existential environmental challenges: food security, climate change abatement, water security, energy security, biodiversity protection and human health (McBratney et al., 2017). However, despite the increasing adoption of this frame in academic circles, it seems to have gained little traction in the policy arena.

Against this background, the following section presents a published journal article that seeks to foreground the role of framings, like soil security, in politicising public problems such as human-induced soils degradation to introduce them into the policy agenda. The aims of this paper are twofold. First, it seeks to synthesise the ideas coming out of the extant literature on framings and their

relation to agenda setting processes and set the ground for sketching the conceptual approach and research methodology that will guide this dissertation. Second, to develop a critical social science perspective to assess how the soil security concept can achieve a more effective framing and contribute to the significant challenge of bringing soils to the attention of policymakers at diverse administrative scales. In so doing, the paper explores the role of framing in connecting agenda setting and problem definition (two distinct but interwoven processes) and discusses if the proposal for enacting a new soils policy in the State of New South Wales in 2011 would have benefited from using this framing.

The key findings are:

- (i) Globally, there is a lack of awareness about the severe rates of soil degradation and the critical role of our “silent allies” in supporting the Earth system. Yet, despite recent international initiatives, the global governance of soil resources is rather weak. We still lack a legally binding instrument to protect global soil resources. At the national/state level, soils remain neglected in governmental agendas, most jurisdictions lack coherent policy frameworks for soil protection, and soil issues are usually addressed indirectly and in a fragmented way (focusing on specific soil functions or processes).
- (ii) As with other academically based frameworks, the soil security concept has achieved little traction outside the immediate realm of academia. Although soil security integrates different dimensions beyond complex soil science arguments (i.e., economic, social, political and psychological dimensions), these are still underdeveloped compared to the former. Consequently, the misalignment in communication and perceptions about soils value between these two communities (i.e., science and policy) likely explain why policymakers have not yet engaged with this concept.
- (iii) The article shows that *framings* of soils, such as that of soil security, could be enhanced and strengthened with a transdisciplinary approach that integrates insights from soil science with the social and policy

sciences. Such work would need to build bridges between soil science and other epistemic communities and with relevant policy actors to construct a narrative capable of moving the issue from the systemic into the institutional agenda.

- (iv) To create awareness, we need stronger narratives drawing on multiple disciplinary strands and based on diverse forms of knowledge, as well as a shared normative goal. In a post-modern and post-truth world, the (soil) scientist's authority and legitimacy are no longer sufficient to attract the required societal and political attention – instead, *society* needs to agree on what needs to shift, why and how.



Contents lists available at ScienceDirect

Geoderma

journal homepage: www.elsevier.com/locate/geoderma

Re-politicising soils: What is the role of soil framings in setting the agenda?

Mariana Gonzalez Lago*, Roel Plant, Brent Jacobs

Institute for Sustainable Futures, University of Technology Sydney, Level 10, UTS Building 10, 235 Jones Street, Ultimo, NSW 2007, Australia



ARTICLE INFO

Keywords:
Soil policy
Soil governance
Soil security
Agenda setting
Framing
New South Wales

ABSTRACT

Soils, like other natural resources, are in crisis; a policy vacuum exists, and we are observing dedicated efforts from the scientific community to address this vacuum. At the forefront of these efforts is the concept of 'soil security', which to date has gained support amongst soil advocates but still lacks traction in the political arena. This calls into question the alignment of current framings of soil sustainability, such as soil security, with policy makers' perceptions of the issue. To contribute to a stronger framing of soils for political agenda setting, we offer a social science perspective. We apply Stone's causal stories framework to review conceptually how 'soil security' and related concepts might operate in agenda setting. From there, we proceed to analyse the jurisdictional case of soil policy development in New South Wales (NSW), Australia. We find that despite the presence of a compelling policy 'window' and completion of a draft policy document, a change of government in NSW has caused the implementation of a new soil policy to fail. While the causes of this failure are largely unexplored, we suggest that the application of transdisciplinary approaches to soil policy processes could help avoid such situations in the future. Transdisciplinary approaches could assist policy processes through the development of a strong soil narrative that can re-politicise soils, instigate lasting soil policies and ultimately lead to societies' sustainable soil use and management. We advocate a more explicitly articulated and implemented transdisciplinary approach, with social science insights about framing and agenda setting as a starting point.

[Production Note: This paper is not included in this digital copy due to copyright restrictions.]

View/Download from: [Publisher's site](#)

* Corresponding author.
E-mail address: mariana.gonzalezlago@uts.edu.au (M. Gonzalez Lago).

<https://doi.org/10.1016/j.geoderma.2019.04.021>
Received 17 November 2018; Received in revised form 10 April 2019; Accepted 16 April 2019
0016-7061/ © 2019 Elsevier B.V. All rights reserved.

Chapter 4

Research Design

This chapter presents the conceptual and methodological approaches guiding this research. First, I will introduce the Politics of Framing Framework (PoFF), the theoretical and methodological dimension of this dissertation that was developed as a heuristic device for the critical analysis of the empirical data. The elements encompassed in the PoFF will be distilled in the subsequent chapters, which are dedicated to exploring the research questions guiding this dissertation. Second, I will present the research questions and briefly explain the overarching methodology. Next, I describe two cases in different jurisdictions (New South Wales, Australia and Uruguay), where processes of problem framing at the science-policy interface have led to different outcomes in soils governance.

Third, I will introduce the methods for gathering primary and secondary data and the process of data collection. Then I outline the data analysis and coding process and ethical considerations.

I conclude with some reflections on the creative nature of qualitative research that does not imply the lack of quality criteria.

4.1 The Politics of Framing Framework (PoFF)

The science-policy interface⁴¹ has a fundamental role in communicating the status of ecosystems and their impacts on human wellbeing to the broader public and, thus, in contributing to tackling the environmental crises (Balvanera et al., 2020; Görg et al., 2016; Voulvoulis & Burgman, 2019). By selecting this research boundary in this dissertation, I am not suggesting that soil degradation is a linear problem, solvable with scientific knowledge alone; the complexity of this problem is largely acknowledged (as discussed in Chapter 2.3.1) as well as the necessity for inter- and transdisciplinary approaches that integrate diverse knowledge and stakeholders (argued in Chapter 3). Rather, I emphasise that science and policy should play a critical part not only in protecting public goods but also *in creating social and political awareness* about environmental issues, such as soil degradation, when it is almost invisible to the public (particularly to urbanised societies). However, as Amundson (2020, p. 1) observes, there is a disconnection between scientific knowledge of soils and the policy arena that has hampered the implementation and expansion of sustainable management practices, and for this reason, he suggests that this nexus should be addressed. Furthermore, if we consider that public attitudes are susceptible to being influenced to some extent by government activities because, as Wolfe and colleagues (2013, p. 176) argue, “[t]he policymaking agenda affects the public agenda”, then such disconnection has broader societal consequences. In other words, the absence of soils policies amplifies societies’ unfamiliarity with soil-related problems.

Although the relevance of the science-policy interface to addressing environmental issues is clear (Lidskog, 2014; Van Den Hove, 2007), the integration

⁴¹ In this study, I do not refer to the science-policy interface as a boundary organisation or a particular model of sharing knowledge. Instead, I use the concept in a broad sense to designate the (not necessarily structured or formal) space of (the often problematic) interaction of these idiosyncratic domains. Amongst the different theoretical approaches to the science-policy interface that can be found in theory, this perspective aligns with the “two-communities thesis” (Caplan, 1979), according to which interaction and transference are hindered because “scientists and policy-makers live and operate in separate ‘worlds’ with different and often conflicting values, reward systems, and conceptions of time” (Pregernig, 2014, p. 3723).

of science into policy is less evident (Ojanen et al., 2021; Wesselink et al., 2013). Most environmental problems debated in the media and the public domain selectively use scientific knowledge (Lidskog, 2014) to construct frames that “promote[s] a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation” (Entman, 1993, p. 52). However, despite the fundamental role of science in helping us understand complex problems and provide inputs to inform decision making (Leith et al., 2017; Voulvoulis & Burgman, 2019), scientific advice is more than simply “value neutral” scientific facts and, thereby, policymaking does not necessarily privilege their contributions (2021, p. 2). According to Lele et al. (2018, p. 2), conflicting environmental frames result from differences “on at least two dimensions: the values they prioritize and the explanatory theories they use, and therefore on the futures they envision”. Consequently, how the two communities frame the environment matters because the convergence or divergence in their interpretations influences a government’s policy choices (or lack thereof) (Meadowcroft & Fiorino, 2017).

Critical framing analysis: Towards the development of the PoFF

According to scholars of framing theory, the fuzziness surrounding the concepts of *frame* and *framing* stems from the different ways in which they are used across distinct disciplines (e.g., sociology, psychology, cognitive linguistics, media studies, and political science) (Chong & Druckman, 2007; Dewulf et al., 2009; Druckman, 2001; Entman, 1993). In this dissertation, I locate both concepts within the field of policy studies and, more specifically, relate them to the approach developed by Rein and Schön (1977, 1993, 1996) and Schön and Rein (1994). As explained in Chapter 2.3.2, against the prevailing rationalist paradigm in the analysis of policymaking according to which policy outputs result from rational and objective deliberations about alternatives and their consequences (Triandafyllidou & Fotiou, 1998), Schön and Rein (1994) argued that policy

formation is a process permeated by disputes⁴² between groups of people with competing interests over meanings and resources. As Triandafyllidou and Fotiou (1998) explain, critical of the apolitical character of the rational actor model, Rein and Schön foregrounded a pluralist view to which policy outputs are “the products of a competitive political game in which multiple interest groups strive to achieve their conflicting purposes”.

Schön and Rein (1994, p. xiii) defined frames as “[t]he broadly shared beliefs, values, and perspectives familiar to the members of a social culture and likely to endure in that culture over long periods of time, on which individuals and institutions draw in order to give meaning, sense, and normative direction to their thinking and action in policy matters”. Frames can be analysed in four different ways: as a scaffolding (an inner structure); a boundary; a cognitive/appreciative schema of interpretation; or as a diagnostic/prescriptive story (Rein & Schön, 1996). In their view, the notion of frames as stories pertains to the act of problem framing. As the authors (Rein & Schön, 1993, p. 148) state, “policy frames and their underlying appreciative systems are revealed through the stories participants are disposed to tell about policy situations”. They described framing as the process through which we can make sense of problematic, ill-defined situations and subsequently propose courses of action (Rein & Schön, 1993). Building on the work of Rein and Schön, Van Hulst and Yanow (2016, p. 97) defined problem framing in policymaking as a process “through which policy-relevant actors intersubjectively construct the meanings of the policy-relevant situations with which they are involved” whether directly or indirectly. Through framing processes, actors organise (tacit and explicit) knowledge and values and guide action (Van Hulst &

⁴² They identify two types of policy disputes: disagreements and controversies (Schön & Rein, 1994, pp. 3–5). In policy disagreements, all contending parties agree on the core facts of a problem; thus, differences can be solved through a re-examination of the evidence or searching for new ones. Conversely, policy controversies cannot recourse to reassessing evidence because there are discrepancies about the core facts of a problem. Moreover, even if the contending parties agree about such facts, they give them different interpretations. Controversies become intractable when the conflicting problem framings affect the capacity to “work out agreements on courses of decision and action in the policy realm” (Rein & Schön, 1996, p. 88) that hinder public learning (Schön & Rein, 1994).

Yanow, 2016). The main premise of framing theory is that the same problem “can be viewed from a variety of perspectives and be construed as having implications for multiple values or considerations” (Chong & Druckman, 2007, p. 104). It is a choice amongst many possible interpretations; therefore, it is always contingent (Turnbull, 2006) and contentious (Snow & Bedford, 2000). Moreover, framing not only refers to the process through which people interpret and conceptualise a problem, but it can also serve to “reorient their thinking about an issue” (Chong & Druckman, 2007, p. 104).

From a constructivist perspective, framings are mobilised purposefully to gain support for a cause (Saurugger, 2016; Stone, 1989) or to block or exclude a problem from the agenda when the proposed frames are not aligned with the interests of powerful groups (Bachrach & Baratz, 1962). Thus, it plays a fundamental role in politics because, in the fight between ideological positions and interests, policy actors use rhetorical and linguistic devices “to give conceptual meaning to an issue and steer political debate” (Kangas et al., 2014, p. 77). In this way, this process mirrors our political positions, values, and expectations, guiding “the strategies and actions to address the problem” (Bardwell, 1991, p. 604). It should be noted that although problem framing is often referred to as an intentional strategy through which actors consciously select the language to influence political debate and decision making, scholars have pointed out that it can also emerge in an ad hoc (Kusmanoff et al., 2017) or unconscious manner (Bacchi, 2009b) with unintended outcomes or intentions to provoke transformational institutional change (Micelotta et al., 2017). Nevertheless, the perspective adopted in this work focuses on the dynamic and *purposeful* nature of framing. Following Aukes (2017, p. 56), this type of approach enables the study of agency-oriented political behaviour – in this case, that of relevant actors at the science-policy interface – to be sensitive to the institutional context in which they are embedded.

Frame analysis, also referred to as framing analysis (Aukes et al., 2020), provides the researcher with a tool to engage in the critical analysis of “assumptions, beliefs, and aspirations” influencing policymaking (Rein & Schön, 1993, p. 157). It is oriented to capturing the differences in sense-making amongst

people, groups, or organisations about decision problems, change processes, or conflictive interactions (Dewulf & Bouwen, 2012, p. 169). This method has become widely used in the study of environmental policies in areas such as climate change (Bosomworth, 2015; Fletcher, 2009; Müller & Kruse, 2021), energy supply (Kivimaa & Mickwitz, 2011; Lis & Stankiewicz, 2017; Metze, 2018), water management (Laeni et al., 2020; Vink et al., 2013), food security (Candel et al., 2014; Mooney & Hunt, 2009; Moschitz, 2018), and biodiversity conservation (Asikainen & Jokinen, 2009; Carmen et al., 2018). The study of the mechanics of this approach tells us that we should be attentive to three operative processes in framing (Van Hulst & Yanow, 2016, p. 96): *naming* – emphasising certain characteristics of an issue, *selecting* – choosing the language to describe the policy problem reflecting the way it is understood and should be discussed, and *storytelling* – is a way of providing conceptual coherence. However, what is it exactly that we are looking into when certain features are emphasised to the detriment of others? Against what criteria do we examine what is being purposefully selected and narrated? To what other elements should we pay attention in a story besides the triad of cause, blame and responsibility to enrich the analysis? Based on the necessity to have more precise coordinates to analyse framings from the collected data in this research, a framework entailing three dimensions as boundaries for exploring problem framing has been elaborated. By focusing on these three dimensions that I will detail below, analysts could be better positioned to critically engage with the contents of framings and how they are mobilised to influence or deter the movement of issues across agendas – from the outside, “the systemic agenda”, to the inside, “the institutional agenda” (Birkland, 2005).

My interest in framing emerges from the persistent challenge to put soils on the policy agenda with the resulting deficiencies in terms of their governance – characterised by the lack of coherent approaches, fragmentation, and reactive rather than proactive actions, as described in Chapter 2 – (FAO & ITPS, 2015; Grunwald et al., 2017; IPBES, 2018; Juerges & Hansjürgens, 2018; Wyatt, 2008). Moreover, it could be argued that in many jurisdictions, soils are excluded from political discussion and kept in the realm of nature or inevitability or the sphere of

private action (Hay, 2007; Stone, 1989), persisting as a “dead matter” of seemingly little interest in the policy arena. However, as it will be contended throughout this dissertation, soils *are*, beyond the more recognisable biophysical, economic and social dimensions, inherently political. This implies going one step further – from acknowledging that soils simply “carry political connotations” and, for that reason, “enter a political realm” (Scoones, 2015) to regarding soils as non-human actors with which we are inexorably entangled (Granjou & Salazar, 2019; Haraway, 2008, 2016; Krzywoszynska, 2019; Krzywoszynska & Marchesi, 2020; Latour, 2004, 2005; Puig de la Bellacasa, 2015, 2017), and thus, are of political significance. This dimension is often overlooked in natural resources governance, as observed by Wilson and colleagues (2019) in a special issue of *Water* dedicated to the re-theorisation of water politics. Moreover, as Meisch (2019, p. 2) argues in discussing water governance issues, the political dimension in water “needs to be made visible and productive in order to contribute to the development of just policies and political institutions”.

Introducing the PoFF

The development of this framework was also inspired by the challenges that environmental problems such as soil degradation must face to be regarded as policy problems. As explained in Chapter 2.3.3, according to Peters (2015), the policy design process entails three phases: the model of causation, the model of intervention and the model of evaluation. From a public policy design perspective (Peters, 2015; Peters & Rava, 2017) that seeks to connect causes, instruments, and desirable outcomes integral to policy interventions, the causation moment is critical because this is when problems are defined and struggle to enter into the institutional agenda. Soil experts have pointed out that this initial phase, especially in soil research projects, is usually overlooked (Bouma, 2015a; Bouma et al., 2007; Keesstra et al., 2016). In this stage, different actors and sectors of society conceptualise a certain public issue as a matter that requires attention and governmental action, pushing to influence decision makers. In this process, the framing of a problem serves to interrelate the subjective and the objective in a

narrative that carries the interpretations of actors seeking to politicise, neutralise or depoliticise the issue at stake. It could be argued, then, that the model of causation is characterised by contingency, competition, conflicts and struggle amongst diverse actors and sectors of society over definitions of what is important and what is not.

Focusing on this stage of the policy process invites us to bring attention to soils politics and what scholars of the post-foundational political thought⁴³ referred to as “the political” – in soils. While engaging with this vast and complex literature is beyond the scope of this dissertation, I will provide a brief overview of the basic traits that explain the “return of the political”⁴⁴ (Mouffe, 2005b) in political theory as it is a relevant analytical category for my framework. To political theorists and philosophers engaged in post-foundational thought, a “post-political” (Mouffe, 2005a; Žižek, 1999) or “post-democratic” (Crouch, 2004; Rancière, 1999) discourse of consensus that foreclosed contentious politics turned ubiquitous after the Cold War era. The triumph of (neo)liberal capitalism and the rise of ideas such as “the end of history” (Fukuyama, 1992) and the “third way” (Giddens, 1994) suggest the end of historical, ideological disputes between the Left and Right, and thus, the exclusion of dissensus and antagonism from politics (Mouffe, 2005a; Rancière, 2015; Wilson & Swyngedouw, 2014). Subsequently, to this intellectual movement, depoliticisation has become the condition of contemporary politics under the

⁴³ Marchart (2007) brought under the label of “post-foundational political thought” the work of several continental European philosophers and political theorists of the “Heideggerian Left” (more specifically that of Jean-Luc Nancy, Claude Lefort, Alain Badiou and Ernesto Laclau). Despite the variegated nuances in their theories and perspectives, he argues that they developed a *post-foundational* thinking whose central tenet is the absence of an “ultimate” foundation in the social world (e.g., essence, ground, totality). However, according to Marchart (2007, 2018), the idea of groundlessness indicates not the absence of all grounds but rather the contingent, temporary and reversible nature of all foundations. Therefore, post-foundationalism is not the same as anti-foundationalism, as the former “does not attempt to erase completely such figures of the ground, but to weaken their ontological status” (Marchart, 2007, p. 2). Consequently, the author claims that any established foundation in society will always remain partial, coexisting with contending foundational moves. In this vein, Paipais (2017a, p. 12) argues that post-foundationalism seeks to “inaugurate an *ethos* of constant interrogation of metaphysical pretensions to foundations”.

⁴⁴ The concept that has turned into a key conceptual tool in political theory (Viriasova, 2011) was disseminated after the publication of Carl Schmitt’s “The concept of the political” (1932).

hegemony of the neoliberal project that privileges the interests of a global politico-economic elite and the use of techno-managerial governance approaches (Beveridge, 2017; Crouch, 2016). Since depoliticisation marginalises the voices contesting the existing order of things, it precludes genuine public debate and meaningful participation hindering the “proper political framing” of public problems (Meyer, 2020; Swyngedouw, 2011).

The growing discontent with *politics* and its depoliticising dynamics on democratic life – reduced to the techno-managerial administration of problems – paved the way to the conceptual re-emergence of *the political* (Mihai et al., 2017; Viriasova, 2011; Wilson & Swyngedouw, 2014). The separation of these terms serves to account for two different but interrelated dimensions of analysis: whereas politics designates the ontic dimension of state-oriented practices and institutions, the political corresponds to the ontological dimension that underlies the institution of “every particular shaping of the social” (Paipais, 2017a, p. 15), and thus it “cannot be fully accounted for by a process of institutionalisation” (Swyngedouw, 2016, p. 2). The political is the realm of contingency, of absent ground, where conflict and dissensus between diverse normative assumptions of reality coexist. More specifically, it can be understood as:

“The contested public terrain where different imaginings of possible socio-ecological orders compete over the symbolic and material institutionalization of these visions. Indeed, the terrain of struggle over political-ecological futures – a terrain that makes visible and perceptible the heterogeneous views and desires that cut through the social body – and how to achieve this is precisely what constitutes the terrain of ‘the political’” (Swyngedouw, 2015, para. 1).

The political is separated from but always related to politics; furthermore, neither term can be grasped without reference to the other (Marchart, 2007). Therefore, by understanding said correlation that Marchart (2007) defined as the

“political difference”⁴⁵ – between *what it is* and *what can be* [emphasis added] (Swyngedouw, 2016) –, we can elucidate the political as always “seen as something that ruptures, interrupts, punctures the ordered reality of politics or stirs up its sedimented practices” (Viriasova, 2011). In a nutshell, the notion of the political is evoked to let in what became excluded, repressed or ignored from institutionalised politics, and thus it claims the re-emergence of contingency, conflict, antagonism, and unpredictability. According to Viriasova (2011), to most scholars of the post-political, the correlation between politics and the political is negative or in other words, “the political emerges at the moment of structural failure, i.e., the failure of politics-as-state”. Nevertheless, despite the acknowledged discontent towards politics, I concur with Beveridge and Koch’s (2017) assertion that it is necessary to engage in politics “as it is and politics as we would like it to be” because if we are to include what is excluded or repressed, if we want to expose failures or injustices, it is only by means of everyday politics. As outlined by Marchart (2018, p. 195), politics is the means for “activating the political”. Furthermore, as Hay claims (2013, p. 111), through politics, we struggle for collective solutions to collective problems, and thus it is “essential to the delivery of collective public goods”.

In the context of this dissertation, by soil politics, I refer to the formal aspects of governing soils, such as institutions, rules, and procedures, whereas by the political, I refer to the realm of contingency and discussion about the different ways in which we relate to soils and how the different understandings of human-soils relationships coexist. To address soil politics and its political correlate, I propose a “Politics of Framing Framework” (PoFF) as a heuristic device for critical inquiry, combining approaches from political and social science, political ecology and environmental humanities. As Lövbrand et al. (2015) have argued, critical social inquiry has an important role to play in overcoming the post-political “trap”

⁴⁵ The difference between politics and the political is inspired in Heidegger’s distinction (the *ontological difference*) between the ontic (particular entities, *beings*) and the ontological (*Being as such*). The political, Marchart (2007) argues, has a double inscription: it designates the domain of contingency, and also the differentiation between politics and political, which cannot be of other nature than political.

in environmental discourses that annuls situated conflicts and contestation and hides unequal power relations. Furthermore, Pellizzoni and colleagues (2022) argue that being critical in environmental politics entails primarily “addressing the job in a certain way” that distances from problem-solving perspectives by committing to questioning the frameworks through which problems and solutions are identified and “in so doing being attentive to the origin and contestation of institutional arrangements, power differentials, agency distribution, knowledge and authority claims, reality definitions, interest and identity attributions, and the transformative potential of alternative approaches and social struggles”.

Nancy Fraser first introduced the notion of “politics of framing” to develop a critical theory of social justice in the book *Scales of justice: reimagining political space in a globalizing world* (2009). The politics of framing is used to advance her theory of social justice, previously centred around issues of redistribution and recognition, to include a third relevant dimension in the *post-Westphalian* epoch (Falk, 1998) – that of representation in decision-making processes. In her work, she argues that in contemporary societies, the “Keynesian-Westphalian frame” of justice – applied within the territorial boundaries of the nation-State – is in dispute as the decision making of transnational forces and foreign governments affect the lives of citizens across the globe. The politics of framing is used in this context to interrogate who is considered a subject of justice today and what is the appropriate – geographical – frame of justice. Under the “Keynesian-Westphalian” frame, matters of justice (meaning “parity of participation”) were focused on two dimensions: redistribution (the fair provision of material resources to overcome mal-distribution) and recognition (elimination of hierarchies of status to overcome misrecognition). However, in a globalised world, competing framings of justice emerge at different levels of governance (nation-State, region, international), leading Fraser to question, “which mapping of political space is just?” (2009, p. 9).

To answer this question, she argues for the inclusion of a third dimension (neglected in her previous work) to build a contemporaneous theory of social justice, which is that of the political, that refers, in her words, to the “scope of state’s jurisdiction and the decision rules by which it structures contestation”

(2009, p. 17). Thus, she concludes that there are three dimensions at interplay in social justice in contemporary societies: the economic dimension of redistribution (the *what*), the cultural dimension of subject recognition (the *who*), and the political dimension of representation in decision-making processes (the *who* and the *how*). This last dimension in Fraser's approach sets the stage for the struggles and competitions over distribution and recognition as it defines who is included and who is excluded (leading to issues of misrepresentation), the boundary-setting for claimants of justice and the frame-setting of the claim (leading to issues of misframing). The politics of framing suggests that the frames (and even the mechanics of framing) should be contested and challenged to secure appropriate political representation.

A politics of framing framework (PoFF) applied to soils deviates from the focus of Fraser's proposal on matters of *social justice* towards matters of *ecological justice*. Departing from the position, as established in Chapter 2, that limited the visibility of soils in the policy arena, the purpose of this framework is to interrogate soils framings at the science-policy interface and their effects in the soils policy space. Understanding the "politics of framing" of soils involves, thus, a critical exploration of political ontologies, power relationships and justice recognition. It is worth noting that the separation of these three interrelated dimensions is artificial and made solely for analytical clarity and convenience. However, in reality, we cannot consider these dimensions to be independent from one another since they are always mutually shaped and permeated. However, if first considered separately, the analysis enriches the knowledge of how each dimension operates in a particular framing. Together, these three dimensions form a critical lens that seeks to explore issue depoliticisation and reimagine just and sustainable soil futures.

Political Ontology

Although this framework (Figure 4.1) may be entered from any of the three dimensions depending on the characteristics of the analysis, political ontology has a fundamental role because our ways of understanding and acting in the world

through, for instance, exercising power or justice, are underpinned by our political stance on what is “real”. William Connolly first used the term “ontopolitical” (1995) to avoid restrictive ontological fundamentalisms and express that our assumptions or beliefs about “reality” or “events”, regardless of how much information we may have, are always engaged in political interpretation. Every political interpretation, Connolly argues, “invokes a set of fundamentals about necessities and possibilities of human being, about, for instance, the forms into which humans may be composed and the possible relations humans can establish with nature” (1995, p. 1). From this perspective, any ontological statement about reality is expressed from a “finite point of view” (Paipais, 2017a), and thus it contains a “political standpoint” (Pohl & Swyngedouw, 2021).



Figure 4. 1 The Politics of Framing Framework (PoFF). In unveiling and unravelling “the political” in soils, the framework critically explores three interrelated dimensions as they may be manifest in experts’ and policymakers’ framings of soil degradation issues.

Source: This research.

Political ontology⁴⁶ is premised on the idea of the impossibility of an ultimate foundation or metaphysical certainty, and thus, it seeks to understand foundations in their ontologically contingent nature (Paipais, 2017a), “from which we may seek to elicit – but not derive – an ethos” (Norval, 2017, p. 505). The critical analysis of ontologies pays attention to their political consequences in terms of “outcomes, inequities, silencing and privileging” that result from contentious ontological worlds (Campbell, 2020, p. 14). Furthermore, as Paipais (2017b) claims, the analysis of ontologies might serve to reactivate silent or marginalised alternative possibilities to the prevailing condition, stimulating transformation. Thus, the exploration of political ontology(ies) focuses both on the existing order of things and the potential possibilities of what it can be from a subjective viewpoint. In other words, we need to investigate the relationship (or difference) between the political and politics amongst diverse positions. Considering the contingent possibilities in human-soils relationships serves to transcend stagnation in the policy arena and thus reimagine other avenues for soils politics (based on, for example, principles of care and conviviality).

⁴⁶ Political ontology and ontological politics are sometimes used interchangeably in the literature, but they are not synonymous. The latter is a concept quintessential to the so-called movement of the “material turn” (e.g., Neomaterialisms, Actor-Network Theory, Eco-Marxism), while the former is entrenched in post-foundational political thought. Drawing on Connolly’s definition, Mol (1999, p. 86) used the term ontological politics to express “a link between the real, the conditions of possibility we live with, and the political” In her view, “reality” and “politics” are mutually influenced, and this means that reality and its conditions of possibility are shaped within everyday practices. Thus, politics is an open and contested process and, as a result, different realities can be performed or “enacted”. To Pellizzoni (2016, p. 76), “the expressions ontological politics and political ontology, rather than signalling contrasting accounts of the relationship between ontology and politics, indicate different narratives of [the] same processes of enactment, which simultaneously involve the matter of politics and the politics of matter”. In his view, a sense of unity between these two notions can be drawn from their standpoint towards the mutual implication of the “real” and “the political” according to which our engagement in public issues is affected by the inevitable intermingling between the human and the non-human. In this sense, they challenge the culture/nature divide in an attempt to “take alterity seriously” in an ethico-political way (Chandler & Reid, 2018, p. 258). However, Pellizzoni claims that there is an irresolvable tension between the two: for ontological politics, the non-human is assembled with – but indifferent to – humans, and thus it interrupts the political without political intention. Furthermore, the recognition of reality as multiple (Law, 2015; Mol, 2002) “does not necessarily entail antagonism or agonism, admitting instead pacific, even friendly compresence” (Pellizzoni, 2016, p. 77).

Therefore, political ontologies – our (political) understanding of soils and our relationships with soils – lead to examining how framings actualise certain soils imaginaries in the social to the detriment of others. Hence, inquiring about the role of political ontology in framings raises questions such as: What human-soils imaginaries are being actualised in dominant framings? How did they become dominant? What potential imaginaries are being ignored or silenced? What distinctive affectations are mobilised by dominant and marginalised framings that support their de/stabilisation in the social domain? What are the conditions of possibility to reframe our relationships with soils for promoting change towards just soils futures?

Power

Next, the PoFF considers the role of *power* in soils framings. Power⁴⁷ is embedded in framings by mobilising ideologies, interests and information that support or undermine the different political positions in a certain process of problem causation. As argued previously, critically engaging in framings requires giving close attention to political ontologies and how they relate to depoliticisation or politicisation of issues by understanding the treatment of the political in relation to politics (e.g., annulled, marginalised, resisted, included). For example, framings can carry understandings of soils as vital living matter affected by humans and requiring governmental intervention for their protection or regarded as belonging to the private sphere (through its attachment to land) and thus should remain “apolitical” (or neutral) to governments or as directly pertaining to the domain of the non-political (e.g., fate, accident). In this manner, power might operate as a form of domination (expressed as “power over”) to depoliticise issues by removing the politically contested nature of public problems, policies and policymaking (Burnham, 2001, 2014; Hay, 2007; Jessop, 2014) or as transformative capacity

⁴⁷ Power is considered here in a broad sense because it allows the researcher to identify whether it operates as a form of domination or cooperation/solidarity – these are the two ways that power can be mobilised in framings, as it will be further explained in Chapter 6.

(expressed as “power to” and “power with”) to (re)politicise issues by moving them from the inevitability of fate to the realm of contingency, creating the possibility of subjecting it to human purpose and intention, amplifying the scope of politics (Hay, 2007, 2013). Although environmental politics has been identified as an almost inescapably depoliticised domain (Swyngedouw, 2007, 2011, 2013), scholars have emphasised that paradoxically, it “also ha[s] the potential for a kind of politicisation *par excellence*” (Kenis & Lievens, 2014, p. 544). In this vein, Anshelm and Haikola (2018) contend that depoliticisation harbours the potential for re-politicisation as a response to the prevalent order. The purpose of politicisation, Jenkins (2011) argues, is to confront domination when power depoliticises issues in such a way that we cannot imagine alternatives. Furthermore, as Hay (2013, p. 109) points out, “[p]oliticisation is about reclaiming social processes and the always uneven outcomes they create from fate; it is about taking responsibility for our collective choices”.

Therefore, being attentive to the exercise of power, particularly when confronted with depoliticising framings on pressing environmental issues, is fundamental to design strategies to better position counter-hegemonic approaches – or alternative political ontologies. Although path dependencies might constrain framing processes, they are primarily a strategy to mobilise relevant policy actors’ interests seeking to impose their visions about desirable social-ecological orders. When we are inquiring about power in human-soils relationships framings, we should ask questions such as: what are the dominant framings and to which ideologies and interests do they conform? Who holds and circulates relevant information about the status of soil resources within government and outside of it? Where is resistance to hegemonic framings, and to which ideologies and interests do they respond?

Justice

The third element of this framework addresses the issue of *justice* that seeks to identify the normative-ethic premises contained in framings. Lakoff (2008) argues that frames are morally based systems of thought, and therefore, “[t]o understand

framing is to understand the moral worldview behind each given position on each issue”. In a similar vein, Thompson (2008) argues that framings are relevant in environmental philosophy because they reveal how a situation or problem is conceptualised in ethical terms, and in that process in which people determine what is “ethical”, alternative framings might be disregarded or become indifferent. Therefore, he claims that “framings orient ethical thinking toward a distinct set of possibilities, on the one hand, but also toward what philosophers might call a particular conceptualization of normativity” (2008, p. 540). A fundamental assumption guiding this dimension is that non-humans can be recipients of justice (Baxter, 2005; Low & Gleeson, 1998; Schlosberg, 2019). This is a challenging and extensively debated issue because, as Schlosberg (2007) argues, to liberal justice theory, nature falls outside the realm of justice. Furthermore, the pervading emphasis on the intrinsic values of nature for human development and wellbeing has given little room for including intrinsic values in policymaking. Nevertheless, in the past decades, theoretical fields such as Actor-Network Theory (ANT), Thing Theory, Material Culture Theory, New Materialism and Vital Materialism argue for the recognition of non-humans or more-than-human natures as part of the socio-political fabric. According to Low and Gleeson (1998, p. 2), ecological justice is “the justice of the relationship between humans and the rest of the world”. I specifically refer to *ecological* and not environmental justice because, as Schlosberg (2007) points out, most of the work on the latter strand focuses on the mal-distribution of environmental impacts on humans but is not concerned with issues of justice to nature. And in this sense, scholars have extensively addressed the mal-distribution of the impacts of land and soil degradation processes to vulnerable groups and regions of the world. The same cannot be said of issues of justice to soils *for the sake of soils*.

Consequently, this dimension is concerned with the ethical considerations of human-nonhuman relationships mobilised in framings. More specifically, it is oriented to exploring how framings portray soils in terms of their recognition and representation in the policy arena and, most importantly, the responsibility for their care and protection. Accepting non-humans as recipients of justice prompts

us to inquire: who/what is recognised as a subject of policy? Who/what is included, who/what is excluded, marginalised or neglected from being represented in the policy arena and why? Where is placed the responsibility for caring about the integrity and vitality of otherness? Who speaks for soils and soil values? What soil ethics guide political action?

Synthesis

The Politics of Framing Framework (PoFF) contributes to framing analysis of environmental problems by suggesting directions to explore empirical evidence critically. The premise of this dissertation is that by unpacking how these dimensions operate in soils framings, we will be in a better position to understand which visions of human-soils relationships are being actualised and which are being silenced, how power is mobilised in those framings and what notions of justice are implied for guiding action. In this way, we can think of the politics of framing as the discursive intersection of the symbolic and the material, where the social, the economic, the ideological, and the ecological coincide. Thus, the task at hand is to inquire into “the political” in soils to put into question current trends in soils politics that tend to naturalise their depoliticisation. In so doing, we can engage in critically discussing pathways for soil re-politicisation, which will nonetheless always be incomplete and contingent. However, the value of re/politicisation rests in the commitment to amplify the domain of politics and shed light on the normalisation of social-ecological orders that continue to exclude and marginalise people and nature.

4.2 Research questions

Using the Politics of Framing Framework, I will investigate (i) how the three dimensions embedded in framings operate in the social construction of soils as a public policy problem in two jurisdictions, New South Wales, Australia and Uruguay, (ii) their connection to processes of soils de/politicisation and (iii) the outcomes in terms of agenda setting and policymaking for soils. With that aim,

each chapter dedicated to empirical analysis (Chapters 5, 6 and 7) will address one of the three main research questions guiding this research by delving in-depth into one of these dimensions. In addition, the questions have been constructed chronologically to explore the contingent nature of problem framing and agenda setting (shown in Figure 4.2 below).

The research questions guiding this study were introduced in Chapter 1 as:

RQ1: *How has the problem of soil degradation been framed in the past in New South Wales?* Supported by these sub-questions:

- a. How were those framings created?
- b. What soils political ontologies are embedded in these framings, and how do they relate to the deployment of de/politicising strategies by experts and policymakers?
- c. What potential order of human-soils relationships sought to be actualised in the policy proposal *Looking Forward, Acting Now*? How does this political ontology account for the policy outcome?

RQ2: *How is the problem of soil degradation currently being framed in New South Wales' policy arena?* Supported by the following sub-questions:

- a. What is the dominant soil framing and to which ideologies and which ideologies underpin it?
- b. To which interests does it conform?
- c. Who holds and circulates relevant information about the status of soil resources within government and outside of it?

RQ3: *How can soils be reframed to secure sustainable and just soil futures following Uruguay's recent soil policy developments?* Supported by the following sub-questions:

- a. Where is placed the responsibility for caring about the integrity and vitality of soils?

- b. What is recognised as the subject of policy, and how?
- c. Who speaks for soils, and how are they represented in the policy arena?

I note that the research questions that initially sought to provide descriptions and explanations about soils neglect in the policy arena were also the trigger for developing my conceptual framework. As previously stated, once I was confronted with the empirical evidence, I found that an organising principle for applying framing analysis was necessary. Therefore, these questions led me to move from gap-spotting of an under-researched topic to the problematisation of theory (Alvesson & Sandberg, 2013).

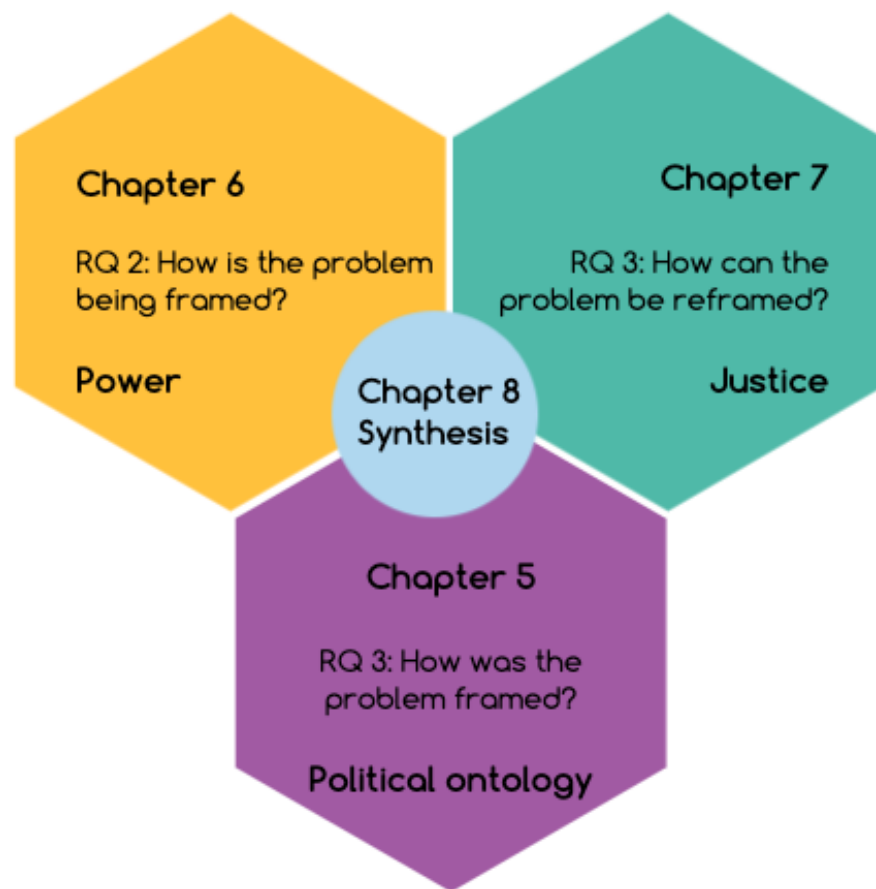


Figure 4. 2 Structure of empirical chapters

4.3 Methodology

The overarching methodology of this research is qualitative, building on a material constructivist ontology (introduced in Chapter 2.3.3) that recognises the material dimension of human-nature relationships in which both ends co-evolve and are mutually transformed. In simple terms, to this ontological assumption, humans appropriate nature and reconstruct it to their benefit creating the environments we inhabit; thus, realities are shaped by society and culture but limited by nature (Arias-Maldonado, 2011, 2019)⁴⁸. However, how we get to know these environments is always mediated through our social and cultural lenses; therefore, the epistemic stance of this research is constructivist/interpretive (as explained in Chapter 2.3.3). Qualitative interpretive research is a situated activity that positions the observer in the world and through which the researcher interprets practices to make things visible; it is the “study of things in their own settings, attempting to make sense of, or interpret phenomena in terms of the meanings people bring to them” (Denzin & Lincoln, 2005, p. 3). Since framing is a process that shapes, organises and makes sense of events by defining them in terms that are meaningful to us (Davis & Lewicki, 2003), qualitative interpretive research is the most suitable approach due to its “sensitivity to contextually specific meanings” (Yanow & Schwartz-Shea, 2014, p. 435). Furthermore, as Bacchi (2016, p. 3) argues, the sensitivity of interpretive approaches is particularly useful in the policy domain to capture “the give and take of politics, [...] the shifting of perspectives and positions, and [...] the role played by politics, here meaning party politics and bureaucratic politics, in decision making”.

⁴⁸ I do not concur with the idea, however, that the mutual transformation of humans and nature (or hybridisation) should suppose the “end of nature” because, by the same token, it should entail the end of society. From my perspective, the entanglement acknowledges the unavoidable interconnectedness, but it does not annul either side of the spectrum because there is still room for their autonomy; not everything is subsumed in hybridisation processes. Humans hold great power to intervene in the world intentionally – and we have indeed affected such vast extensions that almost no pristine nature might be found (McKibben, 2006) – but nature cannot be fully controlled or shaped by humans. Nature holds agentive capacity, although not deliberate as that of humans (or at least, it remains to be proven).

As pointed out by Rein and Schön (1993, p. 157), framing analysis is linked to the hermeneutical tradition of finding meanings in the realm of public policy. I set focus on “framings” – processual perspective – instead of “frames” – cognitive perspective – (Dewulf et al., 2009; Dewulf & Bouwen, 2012; Van Hulst & Yanow, 2016) to emphasise the dynamic and contentious nature of problem constructions (Snow & Bedford, 2000) and the capacity to transform pre-existing frames (Rein & Schön, 1996). In brief, I understand framings as the strategic mobilisation of frames as stories constructed and reconstructed in conversation, employing particular discursive devices through which actors make sense of ambiguous problems (Dewulf & Bouwen, 2012). In the context of this dissertation, such discursive devices are related, for example, to salience in descriptions of events and causal explanations (political ontology), rationales behind governmental strategies to legitimise decisions (power), and value judgements and ethical commitments expressed by participants (justice). The aim is thus to interpret how actors use such devices to represent and explain soil problems. After all, as Hajer (1995, p. 4) claims, “[w]hether or not environmental problems appear as anomalies to existing arrangements depends first of all on the way in which they are framed and defined (Hajer, 1995, p4)”. Consequently, how a problem is perceived and understood has consequences for the way it is enacted in policy and management practices (Turnhout et al., 2013).

4.4 Case studies: setting the boundaries

To empirically explore the role of soils framings in agenda setting and policymaking, I draw upon two case studies, New South Wales (NSW), Australia⁴⁹, and Uruguay. I selected these two jurisdictions because the trajectories of soils in the policy arena have led to different outcomes in their governance and overall protection. I use “case study” as an approach that serves to explore complex issues occurring in a bounded setting (Miles & Huberman, 1994). Since it enables an in-

⁴⁹ In Australia, state governments are responsible for environmental legislation and policy development.

depth understanding of phenomena in their real-world contexts (Yin, 2009), it is suitable for the aims pursued in this research by seeking to understand how soils framings might advance or block the cause of soil protection from the institutional agenda of governments.

In the case of NSW, as explored in Chapter 3, an attempt to introduce a new soils policy in 2011 failed. Consequently, soils governance remains fragmented, with policies and legislations scattered across agencies, strategies and legislation (Webb et al., 2015). Whereas in Uruguay, in the past fifteen years, a series of policies and legislation concerning soils have been passed, rendering as a “good example” in soil conservation (FAO & ITPS, 2015) and “one of the most advanced soil protection regimes for arable land in the world” (World Bank, 2017). Furthermore, it was recently identified as a “global standard bearer of soil governance” along with a small handful of countries (Peake & Robb, 2022). Hence, the Uruguayan case seems to be an exception rather than the rule, whilst the NSW case resonates with what has been happening in other jurisdictions and at different scales where attempts to promote soil protection policies failed or were neglected.

In synthesis, my criteria for selecting these two units of study (Flyvbjerg, 2011) are based on the differential treatment of soils in the policy domain. Within each case, I focus on discourses at the science-policy interface because, as I have previously explained, soil degradation issues are practically inadvertent to the public rendering these two communities fundamental in creating awareness. It should be clarified that this is not a comparative study. Instead, the aim is to show how different ways of problem framing situated in these specific settings come to be and their consequences for governance.

In the following paragraphs, I will provide additional information about the NSW case that was introduced in Chapter 3 and will be further elaborated in Chapters 5 and 6 and will also briefly describe the case of Uruguay, which will be addressed in Chapter 7.

New South Wales

As explained in Chapter 3, in NSW, almost every area is experiencing some form of soil degradation (DPI, 2011; EPA, 2015), and therefore, it is a major environmental, social and economic concern (Chapman et al., 2011). According to the latest report on the State of the Environment (EPA, 2018), NSW's soils are, in general, in a moderate condition⁵⁰, with some areas suffering a more significant decline than others due to land-use intensification, climate variability and extreme weather events, affecting their capacity to deliver ecosystem services. The main soil degradation issues in the state are acidification, the decline of soil organic carbon, salinisation, hillslope and wind erosion (EPA, 2018). The distribution of these issues of concern across the state is shown in Figure 4.3.

Many of these soils problems are related to the natural conditions of the continent – ancient, with low levels of organic matter and poorly structured (Kanowski & McKenzie, 2011). However, as Diamond (2005) has pointed out, the already extreme ecological frailty has been endangered by an ongoing culture of “*mining*” the natural resources that have drained soils of their intrinsically low levels of nutrients since colonial times, causing bigger problems than water availability. Although much progress has been made in the treatment of soils since the enactment of the Soil Conservation Act in 1938, still in NSW, as in other Australian states, unsustainable soil management practices are driven by the lack of coherent protection frameworks and a “dominant market-driven agenda of the commodification of natural resources” (Williams, 2015, p. 7).

⁵⁰ Soil condition can be defined as “the capacity of a soil to function, within land use and ecosystem boundaries, to sustain biological productivity, maintain environmental health, and promote plant, animal, and human health” (Department of Natural Resources and Environment Tasmania, 2022).

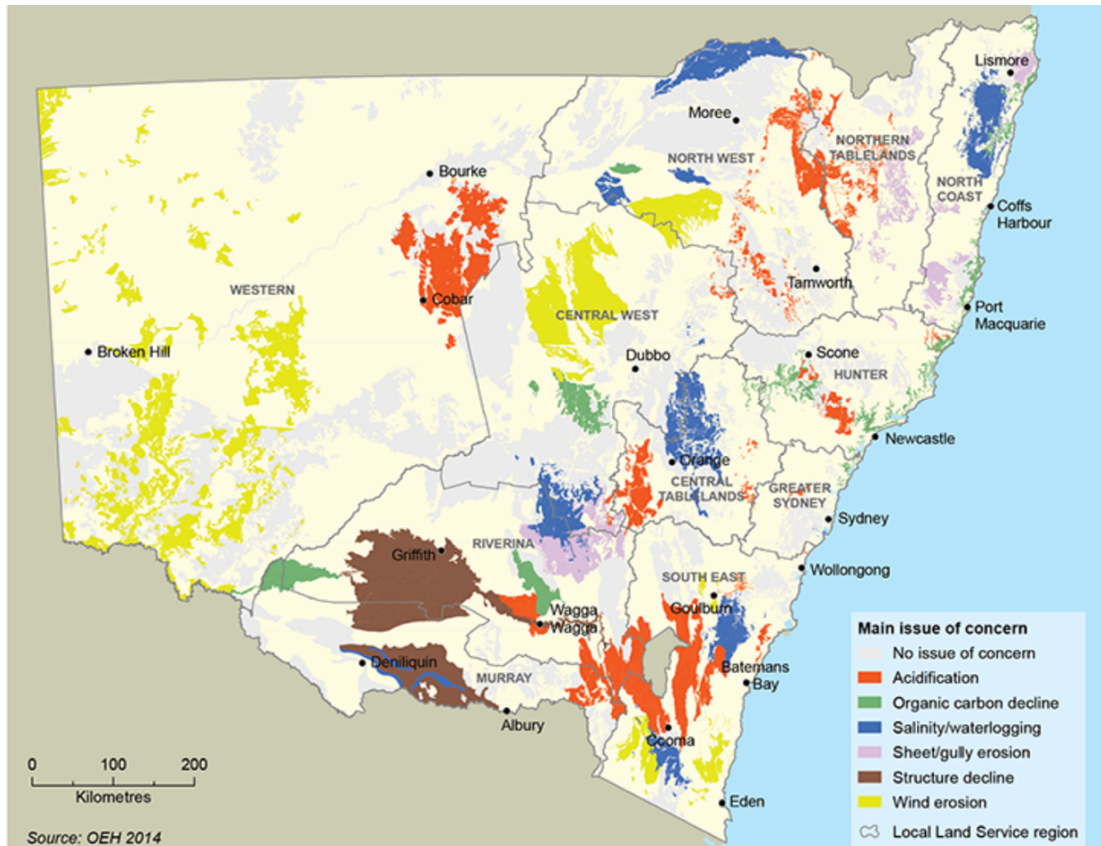


Figure 4. 3 Main degradation issues in NSW within soil monitoring units.

Source: EPA, 2015.

Soils dedicated to agricultural production occupy approximately 81 per cent of the state, of which 44.4 per cent is grazing native vegetation (ABARES, 2021). Today, the increasing acidification of agricultural soils from the intensification of land use (20 per cent are at high risk of severe acidification) is a significant challenge resulting in constant declines in soil condition and productivity (EPA, 2018). Nevertheless, despite the social and ecological importance that soils have for the state and the risks of degradation, the issue has been blocked in the past decades from the institutional agenda. The most recent example of this is the rejection of the soils policy proposal “NSW Looking Forward, Acting Now” in 2011.

Uruguay

Located in the temperate southern South America – Pampas’ biome – Uruguay’s soils are highly productive, with 93 per cent of the territory apt for farming (DIEA-MGAP, 2011). Uruguay is socioeconomically dependent on soils (Zurbriggen et al., 2020). In 2019 the agricultural sector represented 11 per cent of the country’s GDP and 82 per cent of the total goods exported (Uruguay XXI, 2020). Of the productive land, 42 per cent is assigned to livestock (including meat, wool and dairy production), 43 per cent to agriculture (including extensive agriculture such as cereal and industrial crops and intensive agriculture such as citrus, wine and horticulture) and 15 per cent to afforestation (Ministry of the Environment of Uruguay, 2020).

Since the beginning of 2000, soil uses have dramatically changed due to three major agrarian transformations: the expansion of the forestry complex (afforestation and cellulose), the boom for oilseeds and cereals (particularly soybean), and the intensification and higher quality production of beef driven by the increasing demand for food and natural resources from China and India (Zurbriggen et al., 2020, p. 54). These changes increased competition for the land, expanding the agricultural frontier into natural environments, particularly with soybean plantations that transformed natural grassland and displaced cattle farmers (Rocha et al., 2019). Furthermore, they have caused multiple impacts on the environment, such as increasing soil erosion, biodiversity loss (due to agriculture intensification), water pollution (due to fertilisers and agrochemicals), the introduction of invasive species, and the loss of native forests and savannas (Baraibar, 2020; Perez Rocha, 2020).

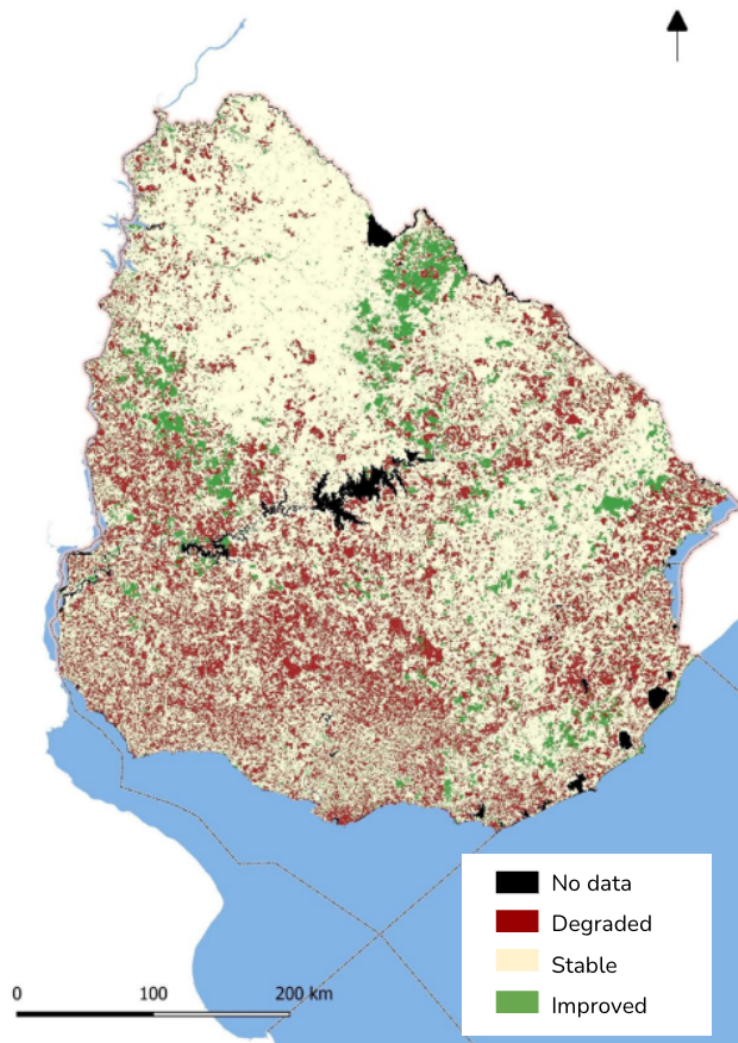


Figure 4. 4 Comparison of the state of soil degradation in Uruguay between 2000 and 2015. The assessment applied UNCCD’s Land Degradation Neutrality methodology which integrates three indicators to define soil degradation: change in land use, change in land productivity and change in soils’ organic carbon.

Source: Ministry of the Environment of Uruguay, 2020.

According to the first report on the state of the environment conducted by the recently created Ministry of the Environment of Uruguay (2020), between 2000 and 2015, 65 per cent of the country’s soils remained stable, particularly in natural grasslands dedicated to extensive cattle grazing and sheep. The report states that 26 per cent of the soils have been degraded – of which 13.8 per cent were natural grassland coverage (Perez Rocha, 2020) – mainly due to the intensification of agriculture (e.g., rainfed crops, forage crops, and rice cultivation). Overall, about 8

per cent of the soils have improved their condition in this period, mainly in areas of natural forests and forestation.

In recent years the environmental sector has been an active area of decision making, with the implementation of new policies (e.g., National Environmental Plan for Sustainable Development 2018, National Climate Change Policy 2018, National Water Plan 2017, National Biodiversity Strategy 2016) and institutional organisations (e.g., National Environmental Cabinet 2016, National Environmental System 2016, National Climate Change Response System 2009). In response to the increasing erosion of soils from the unsustainable management practices driven by the changes mentioned above, the government implemented a new soils policy, the Soils Use and Management Plans (SUMP) for croplands, mandatory since 2013. The SUMP aim to regulate and promote the sustainable use of soils by establishing rotations to preserve, restore or increase soil organic matter and minimise erosion through conservation practices, considering soils characteristics. Other relevant policies to soils governance in Uruguay include the National Adaptation Plan to Climate Variability and Change for the Agricultural Sector (NAP-Agro, 2019), which amongst its objectives, proposes adaptation as a fundamental strategy in agricultural production systems and strengthened SUMP. The Agroecological Law passed in 2018 aims to promote the production of agroecological products to strengthen food sovereignty and security and the protection of the environment (including soils conservation, restoration, and overall health). In synthesis, in the past two decades, Uruguay has been building a progressive environmental agenda in which soils are a relevant actor.

4.5 Data gathering methods

The selection of the methods for gathering data was guided by the ontological assumptions and research questions guiding this study. I used the qualitative interview as my primary method for *generating* (or *co-generating*) data – more appropriate terms for interpretive inquiry since the researcher is an active participant in the interaction and the subsequent analysis of materials (Yanow &

Schwartz-Shea, 2014). Through interviews, we can access discourses in a communicative process in which every sentence acquires meaning in its own particular context and has the potential to reveal the underlying meaningfulness of events and experiences for different people. However, the information generated is the result of a “fusion of ideas” – or dialogic intersection – in which the researcher engages and interprets the story as it unfolds (Vandermause & Fleming, 2011, p. 370).

Interviews were conducted one-on-one and in-depth, aiming to elicit insightful responses. The *in-depth* interview or *intensive interviewing*, according to Charmaz (2006, p. 27), provides flexibility to enquire for additional information to explore a statement or topic further, go back to key questions, ask about participant attitudes, perceptions, feelings, motivations, slow or hasten the pace, and respect participation and express appreciation. In the interpretive tradition, the in-depth interview entails a “give-and-take between individuals” in which one responds to the other, and therefore, it can lead to unpredictable paths arising emotions, discomfort, and tensions that must be navigated by the researcher (Soss, 2014, p. 169). Some tactics I used to manage such moments during conversations were to adopt an amicable tone, avoid an interrogative posture, and be a respectful and humble listener about the other’s knowledge and experiences. The aim was to make participants feel comfortable to encourage their cooperation, elaboration, clarification and reflection in the pursuit of “thick descriptions” (Geertz, 1973; Soss, 2014).

Initial guides with key questions were designed for each research phase to engage participants in the conversation, but they were used in a flexible way, and new questions emerged as conversations unfolded, following the lead that participants were taking and adjusting emphases insofar as significant issues arose (Bryman, 2012). Moreover, these guides were modified as the fieldwork progressed. Interviews were audio recorded and transcribed whenever possible as the information arising in each case was relevant for the subsequent cases.

I also used *documents* to understand the problem in context by providing a historical account and official interpretations and definitions. Documents worked

as supporting evidence in gathering rich data to build significant analysis. The inclusion of various data collection methods in the research process is considered a mechanism for data *triangulation* – a technique that delivers *credibility* to the research (Bryman, 2012). Furthermore, triangulation is usually conceived as an alternative to the criteria of validation in quantitative research (Flick, 1992).

Documents were selected based on their content's additional information to deepen descriptions (Cresswell, 2007; Prior, 2007). Consequently, I reviewed documents related to soils governance in both contexts (NSW and Uruguay), specifically official public records such as legislation and official reports. I also looked for media outputs regarding focused events related to soils (e.g., environmental crises such as the Red Dust Storm in NSW) and relevant news to further understand how the problem is socially constructed. As Charmaz (2006, p. 35) argues, “texts tell something of intent and have intended-and perhaps unintended-audience”, and for that reason, they should be reviewed critically, focusing on aspects such as the content, intended audience, and position of the author.

4.6 Data collection process

The fieldwork was developed during the months of May and December 2019. Between May and October, I conducted interviews with participants from New South Wales. In August and November-December 2019, I conducted interviews with participants from Uruguay. Interviews with Uruguayan participants were conducted in Spanish, and I translated them into English during the analysis.

[Selection of participants and sampling](#)

The research process entailed three phases of data generation to answer each one of the three research questions entailed in this study. Since I defined the science-policy interface as a research boundary, three groups of participants are of particular interest: experts, policymakers and policy entrepreneurs. Chapter 2 explained the role of these actors in agenda setting. In a nutshell, experts have a

fundamental role in bringing attention to problems and claim governmental action shaping the systemic agenda, policymakers have a responsibility to contribute to shaping the institutional agenda and deciding which problems are brought into serious consideration, and policy entrepreneurs are the intermediaries that seek to push issues across agendas.

Depending on the nature of the question guiding each phase, some groups were more relevant than others. In the first stage, where I explored the career of soils in NSW's policy arena and the development of the soil policy proposal between 2009-2011, experts with vast experience in the public sector and policymakers involved in the process of policy design were key informants to answer my research question. In the second phase, experts, policymakers and policy entrepreneurs were all relevant to explore current soils framings that might explain the policy gridlock in NSW. In the third phase, where I searched for emerging notions of justice related to soils in the recent policy developments in Uruguay, I prioritised talking to policymakers that were involved in these decision-making processes and the views of experts about said processes.

To recruit participants, I used snowball sampling⁵¹, a form of purposive sampling that starts by selecting a small group of people who can purposefully inform an understanding of the phenomenon under study (Cresswell, 2007). These participants suggest other participants who "have had the experience or characteristics relevant to the research", and the process goes on in this manner (Bryman, 2012, p. 424). For the first and second stages of this research focused on NSW, my supervisors suggested initial contacts, who subsequently recommended other relevant actors to interview. In the third stage, I used my professional network in Uruguay to find respondents who later guided me to other suitable interviewees.

⁵¹ This sampling approach was considered appropriate for this study because the groups involved in developing the respective policies (i.e., NSW and Uruguay) are small. Although snowballing might lead to participants suggesting like-minded people, affecting the breadth of views included, this limitation was addressed by securing the participation of respondents from the range of groups relevant to the research (i.e., experts, policy entrepreneurs and policymakers) and by triangulating information using document analysis.

The research pursued the ideal of *theoretical saturation* to achieve the greatest variety of data for the categories included in my conceptual framework. Thus, snowball sampling was articulated with *theoretical sampling*, which is the form of sampling privileged in Grounded Theory with the purpose of developing the theoretical structures that arise from the fieldwork. Theoretical sampling is defined as a process of data collection for creating theory whereby the analyst jointly selects, encodes, and analyses information and decides what information to look for and where to find it, to develop the theory as it emerges from the data (Glaser & Strauss, 1967). In theoretical sampling, decisions are aimed at identifying all the relevant properties of a category. In the sampling process, each case (e.g., in depth-interview) serves as a guide to identifying properties and dimensions to observe in the following cases. Theoretical sampling “allows the researcher to move from description to conceptualization and most specifically from the general to the abstract” (Strauss & Corbin, 1998, pp. 96–97). Sample decisions are justified according to the theoretical relevance of the cases to produce data. This leads to performing an exercise of constant comparisons to test if emerging properties (to a category) in each discourse are applicable in the following cases. Thus, by means of constant comparisons (Suddaby, 2006), I identified the properties contained in the categories of the PoFF.

Interviews

Interviewees were first approached through email and phone calls; all participants received a formal invitation to participate and a brief explanation of the research aims. The recruitment process was voluntary, and all the interviewees received an information sheet and consent form attached to the invitation email and provided their signatures. In some cases, participants requested a set of questions before the interview so they could have time to think about the topics to be discussed. At the beginning of the interviews, I explained the objectives and purpose of the research in more detail while giving them time to connect with the research subject and their experiences (Vandermause & Fleming, 2011). This was particularly important for the interviews where I sought to elicit memories and map chronological events

– *retrospective review* (Bason, 2017) – surrounding soils trajectory in the policy domain.

Although face-to-face interviewing was the preferred form of data collection, due to the difficulties of accessing people in remote areas and busy agendas in some other cases, I resorted to online communication and, in fewer cases, to telephone calls. The selection of the online video call system (e.g., Skype, FaceTime or Zoom) was left to the interviewee's preference. As noted by qualitative researchers, online interviewing comes with several advantages as well as limitations (Deakin & Wakefield, 2014; Janghorban et al., 2014). Online interviews presented some important challenges against the perks of flexibility and convenience regarding time and location for participants. Most of the limitations experienced were related to slow internet connectivity in some areas of NSW that affected sound quality. In some cases, the time lag interfered with the cadence of the conversation, and in others, it meant directly losing entire sentences or words. Other challenges included software glitches with webcams (and in some cases, they had to be turned off to improve the audio), as well as the incapacity (when the camera was off) to read the participants' physical predisposition and gestures, which is an essential feature of qualitative inquiry.

A total of 26 interviews were conducted, with 16 participants from NSW and 10 from Uruguay. More specifically, for the first phase, I interviewed seven participants, all of whom were soil experts with a long history working in public sector agencies within the NSW Government, some at a senior level, others as extensionists or as scientists. Furthermore, all of them were engaged (to different degrees) in the process of developing the soil policy proposal between 2009-2011. The majority are now retired. The interview guide for this phase aimed to explore, amongst others, how soils entered the policy arena, the conditions that led to the opening of a window of opportunity to developing the soils policy, what was the dominant vision about what should be done to protect soils in NSW, and why the new administration was prejudiced towards the proposal.

In the second phase, I conducted nine interviews in NSW, of which three were with senior public officials working in the soils sector, four soil experts, and two

soil policy entrepreneurs. Interviews sought to investigate differences in problem framings between the scientific community and the public sector from a public policy perspective by exploring opinions about the current status of soils resources in the state, who are affected by soil degradation process, who are pushing the issue forward in the policy agenda and who are against it and why, how private ownership of the land affects perceptions of soil as a public good, and what assumptions about the causes of soil degradation affect soil protection in policy, and so forth.

In the third phase, I interviewed ten participants from Uruguay, of which five were senior public officials involved in the design and implementation of the SUMP, and five were experts from different disciplinary backgrounds⁵² (agronomy, biology, and environmental sciences). In this phase, the diverse topics addressed in the interviews included the process that led to the development of SUMP, how scientific knowledge was transferred into the policy arena and how it contributed to building a compelling narrative for policymakers and stakeholders, what dominant view of human-soils relationships are embedded in the policy and what soils values are prioritised in the current governance of soils.

The average duration of the interviews was one hour, with the minimum time being half an hour and the maximum two hours. They were audio-recorded (using, in all cases, an external device) and transcribed whenever possible, as the information arising in each case was critical for the subsequent cases. I used field notes taken during the interviews to complete information or add comments based on self-reflection and to adjust the interview guide. Also, field notes were useful for tracking changes to my initial research plan, and the challenges faced, providing further material to my sense-making process (Schwartz-Shea & Yanow, 2012).

⁵² In Uruguay, there exists no academic degree in soil science. Most people dedicated to soils research have a postgraduate degree from a foreign university or come from disciplinary backgrounds in agronomy and biology.

Table 4.1 List of Interviewees

Chapter	Interviewee	Organisation
Chapter 5, New South Wales	Exp1	NSW Department of Primary Industries - Soils Policy Working Group
	Exp2	NSW Department of the Environment and Climate Change - Soils Policy Working Group
	Exp3	NSW Department of Primary Industries - Soils Policy Working Group
	Exp4	NSW Catchment Management Authority - Soils Policy Working Group
	Exp5	NSW Department of Primary Industries - Soils Policy Working Group
	Exp6	NSW Office of Environment and Heritage - Soils Policy Working Group
	Exp7	NSW Department of Primary Industries
Chapter 6, New South Wales	Exp8	University of Sydney
	Exp9	NSW Department of Primary Industries
	Exp10	NSW Department of Primary Industries
	Exp11	University of Technology, Sydney
	PE1	Independent consultant soil management
	PE2	Independent consultant agriculture and irrigation systems
	PO1	NSW Department of Primary Industries
	PO2	NSW Office of Environment and Heritage
Chapter 7, Uruguay	PO3	Australian Government, Department of Industry, Science and Resources
	PO4	Ministry of Livestock, Agriculture, Forestry and Fishery of Uruguay
	PO5	Ministry of Livestock, Agriculture, Forestry and Fishery of Uruguay
	PO6	Ministry of Livestock, Agriculture, Forestry and Fishery of Uruguay
	PO7	National Agrarian Research Institute, Uruguay
	PO8	National Secretary of Environment Water and Climate Change of Uruguay
	Exp12	Ministry of Livestock, Agriculture, Forestry and Fishery of Uruguay
	Exp13	National Agrarian Research Institute of Uruguay
	Exp14	University of the Republic, Uruguay
	Exp15	South American Institute for Resilience and Sustainability Studies, Uruguay
Exp16	South American Institute for Resilience and Sustainability Studies, Uruguay	

Exp: Expert

PE: Policy Entrepreneur

PO: Public Official

Document analysis

For each phase, I searched for documents that could serve as sources of secondary data to articulate – or triangulate – with information from interviews to corroborate data and obtain more detailed descriptions of the background and historical accounts. Gathering information from documents usually entails finding, selecting, assessing, and synthesising their content (Bowen, 2009). In the first stage, I reviewed several institutional documents developed by the state, such as the Soil Conservation Act (1938), the Soil Policy Proposal NSW Looking Forward Acting Now (2011), the Biophysical Strategic Agricultural Land Protocol (BSAL, 2013), news articles regarding the Dust Storm event in 2009, and various official reports elaborated by government agencies such as the Environment Protection Authority NSW State of the Environment 2009, 2015.

In the second stage, I examined recent official documents both at the state and national levels, such as NSW's Biodiversity Conservation Investment Strategy (2018), the National Soil Research, Development and Extension Strategy (2014) and the National Plan to Deliver Net Zero – *The Australian Way* (2021). News media articles covering soil-related issues (e.g., soils and climate change), public discourses (e.g., the speech given by the Australian Prime Minister Scott Morrison to the Press Club in 2021) and reports informing about soil trends were also reviewed and integrated into the analysis (e.g., State of the Environment 2015, 2018).

In the third stage, I reviewed policy documents, such as the Uruguayan Soils Use and Management Plans policy (2013), the Agroecological Law (2018), the National Environmental Plan for Sustainable Development (2018), the National Adaptation Plan to Climate Variability and Change for the Agricultural Sector (2019). I also reviewed reports about the status of soils resources, such as the first National State of the Environment report (2020) and news articles covering these recent developments in soils governance.

4.7 Analytical process

The research followed the principles of iteration and flexibility, where data generation and analysis took place simultaneously to identify emergent categories and themes. As Shwartz-Shea and Yanow (2012, p. 55) explain, flexibility is an intentional strategy in interpretive research because the researcher is in a continuous process of learning, and as a result, the initial research design and questions might be changed. Although initially framing analysis was the selected method for the analysis, the emerging data pointed to the necessity for more precise guidance regarding where to orient the attention in looking for salience and emphasis in participants' storylines and in reviewing documents. This led to the early development of the PoFF as a more nuanced and critical tool for conducting the analysis and addressing the research questions. Consequently, the analytical process consisted of deductive and inductive cycles: the dimensions and categories included in the PoFF are the synthesis and reflection of the theoretical approaches explored in Chapters 2 and 3 and the emerging data from the fieldwork. The analytical process unfolded in this way, moving iteratively from theory to data.

Interviews were transcribed and subsequently coded as "the first step in moving beyond concrete statements in the data to making analytic interpretation" (Charmaz, 2006, p. 43). Coding (labelling, categorising and summarising groups of data) was an iterative process where I used a pragmatic strategy of initial open coding to sort data and extract concepts (first coding cycle), followed by several cycles of focused, manual coding to develop and synthesise ideas and interpretations (second coding cycle) and identify emergent themes (Charmaz, 2006; Saldaña, 2009). For the first coding cycle, I used sticky labels and A3 sheets of paper to map the various emerging concepts with the corresponding brief ("in vivo") description and grouped them into large themes. In the subsequent coding stages, I used MS Excel worksheets to organise the thematic analysis, focusing the codes on building the properties of the categories and their relationships (axial coding). Content analysis of documents looking to corroborate and cross-check

primary data was articulated in the analysis, seeking to construct as many layers of information as possible to a property within a category.

To answer the first research question (addressed in Chapter 5), I first explored the trajectory of soils since they entered NSW's policy arena with the passing of the Soil Conservation Act in 1938. The analysis was oriented to problematise (Bacchi, 2012; Foucault, 2019) how soils have been addressed by the State across time and identify how shifts in thinking human-soils relationships have been accompanied by de/politicising strategies that have affected agenda setting (Buller et al., 2019; Hay, 2007; Jenkins, 2011).

The second part of this chapter analyses the failed attempt to re-politicise soils with a new policy proposal (i.e., NSW Soils Policy Looking Forward, Acting Now, DPI) by delving into the *political ontology* embedded in the policy framing. To do so, I investigated what *potential* human-soils relationships were sought to be sedimented in reality against the *actualised* one and the role of *subjectivity* and *affectivity* in pursuing those alternative scenarios. Contextualising the evolution of framings will serve to understand the dynamism of soils political ontologies and their consequences on soils governance.

To answer the second research question – the focus of Chapter 6 – I explored how discursive *power* (utilitarian to instrumental and structural forms of power) is shaping the “fragmented” governance landscape of soil resources in NSW (Webb et al., 2015). The objective is to explain what *ideologies*, *interests* and *information* (Jones & Baumgartner, 2005; Weiss, 1983) are embedded in the dominant framing of soils in the policy arena and how they operate in their exclusion from the policy agenda (Bachrach & Baratz, 1962; Lukes, 2005). Drawing on the premise that depoliticisation contains the potential for re-politicisation (Anshelm & Haikola, 2018), investigating how forms of “power over” are carried in soils framings is an entry point to think about emancipating narratives for sustainable and just soil futures.

The third research question is addressed in Chapter 7, where I analyse recent soil policy developments in Uruguay, resulting in the country being internationally appraised as a good example of soils governance. I explore this process of soils

politicisation by focusing on the *justice* dimension of the PoFF. The aim is to elicit emergent notions of justice in how these policies frame soils by understanding how responsibility for their protection is defined and endorsed, how soils became recognised as policy subjects and how they are represented in the policy arena. Elucidating how these elements are embedded in the narrative promoted in Uruguay to advance soils protection could provide guidance to build more compelling narratives to politicise soils and contribute to policy change.

4.8 Ethical considerations

This research was undertaken in accordance with the ethical standards determined by the UTS Responsible Conduct of Research Policy and following the Australian Code for the Responsible Conduct of Research. The research protocol of this study was approved by the UTS Human Research Ethics Committee (UTS HREC ETH18-3052). Overall, ethical considerations included: informed consent from participants that were obtained in all cases, respecting the confidentiality and anonymity of participants; voluntary participation in the research; and independent analysis of data.

Regarding confidentiality, I have secured the anonymity of all participants by de-identifying all the data and removing names from recorded files. Audio recordings and transcripts of interviews were stored on a password protected computer with a copy on an external encrypted hard drive and in private folders accessible only to the researcher. Participants' verbatims used throughout the analysis are referenced by the group they belong to (e.g., experts, public officials and policy entrepreneurs), avoiding any individual attribution.

4.9 Challenges

One of the main challenges of this research was related to using a non-rational methodological approach that was flexible and adaptive as the fieldwork unfolded and, thus, had no "formulaic steps, solutions or predetermined outcomes" (O'Connor & Netting, 2011, p. 168) about where things were going. To address this

uncertainty, I started analysing data as soon as it was collected. This allowed me to make the required adjustments and coherently follow the lead of the information emerging from the field. This flexibility and sensitivity to context also required reflexivity about my own perspectives and practices influencing the research process. Boundary management skills were also relevant to identify that my personal ideology and biases did not disturb the process of listening to competing perspectives required for rich analysis (O'Connor & Netting, 2011).

Another difficulty was engaging participants from the public sector. In addition to the already small size of this community, their busy agendas proved to be a challenge in the recruitment process. Consequently, the fieldwork rendered time-consuming, and I had to adapt my research plan by extending it longer than initially expected.

4.10 Conclusions

This research follows a qualitative strategy that is essentially creative and interpretive. As Denzin and Lincoln argue (2017), in qualitative research, the researcher creates narratives from the field, and the final interpretive document may assume different forms, from realist to literary. With this dissertation, I aspired to write a critical text that resulted from a journey in which I moved between the creative and the political – my own values and normative assumptions – to make sense of the data and interpret my findings. However, the interpretive practice does not imply a lack of rigour or a vacuum of quality criteria. Throughout this chapter, I explained how I sought to conform with quality or trustworthiness (Lincoln & Guba, 1986). First, the credibility of research findings and guarantee of good practice was sought through the triangulation of methods and respondent validation through feedback from participants. Second, transferability or the possible application of findings to other similar contexts was pursued through rich descriptions of the categories included in the conceptual framework. Third, dependability and conformability, which aim to guarantee that despite personal bias, there is independence in the analysis of the information, were pursued by the

external audit of the analysis by my supervisors, peers, and other scholars interested in my research.

Chapter 5

Tracing the career of soils in the New South Wales policy arena: a political ontology perspective

Until recently, soils have been almost inadvertent in Australian political discourse. This is despite growing demands from experts and policy entrepreneurs to improve soil management to restore and enhance soil's vital functions and processes. There are multiple reasons for such claims. According to the latest national State of the Environment report (2016), pressures affecting Australian soils include: clearing of vegetation; altered fire frequency and intensity; changes in land uses and management practices that affect ecosystem services; invasive diseases, pests and weeds; urban expansion; mining activities; waste disposal; and water diversion, changed hydrology and salinity (Metcalf & Bui, 2016). Furthermore, soil degradation processes are at risk of becoming more critical under climate change pressures (Campbell, 2008). In addition, research has indicated that in the past two decades, agricultural productivity growth has declined at a faster pace than in previous historical periods due to farming practices (e.g., increased cropping intensity and decline in the use of legume leys) (Lake, 2012), which can affect food supplies for the domestic market and exports – estimated at \$30 billion annually (DAFF, 2014). Since soil formation rates are

universally extremely slow, and therefore the existing soil cover “is all that will be available for use for generations to come”, then soil conservation and reduction of soil loss is “an important land management endeavour to ensure the long-term sustainability of Australian landscapes” (Bui et al., 2010).

Arguably up to today, an overall “benign neglect” depicts the national status quo in terms of soil policy development (Schoknecht, 2010). Though Australia has an array of environmental legislation and instruments at national and State levels that relate to soil management issues since the 1990s, soil conservation has gradually “fallen through the cracks” (Campbell, 2008). In a report to the Prime Minister of Australia in 2017, the appointed National Soils Advocate, the late Major General Michael Jeffery, illustrated this oversight when he recommended – following the example of the dedicated efforts of the water sector – the development of a national soils policy to protect and improve the health of Australia’s soils for the benefit of the public. In Jeffery’s (2017) words:

“I believe that a national approach to soils is needed, and that this should be driven through the development of a comprehensive National Soils Policy which integrates soil, vegetation and water management to maintain and restore the health of Australia’s agricultural lands”.

Such coordinated national effort to protect the soil in policy would require States to follow established guidelines. Nevertheless, that possibility is hampered by a multi-layered and fragmented governance of natural resources, as Bellamy (2007, p. 104) pointed out, because each State and Territory develop their own regulations and programs that “differ in scale, style, resourcing and accountability standards within themselves”.

In the State of New South Wales (NSW), where some of the continent’s more fertile lands are found, degradation is a pressing environmental concern because though soils are generally in a moderate condition, 74 per cent of the territory is experiencing some form of soil decline (e.g., acidification, salinisation, loss of organic carbon, loss of topsoil), while several areas are exposed to multiple types of degradation (EPA, 2015; OEH, 2014). In the preamble of a soil policy proposal for

NSW, to be examined in detail in this chapter, it was stated that “Soil erosion, salinity and acidification, decline in soil structure, loss of soil fertility and loss of valuable agricultural land to urban and other non-agricultural uses are some of the stresses and pressures presently affecting soils across NSW” (DPI, 2011a, p. 5).

According to Hannam (2001), NSW has one of the most comprehensive environmental legislative systems in Australia. Nevertheless, despite a relevant history in soil conservation that began with the passing of the Soil Conservation Act (SCA) in 1938 and which established the creation of the Soil Conservation Service (SCS), today soil protection is not an active part of the institutional agenda. Webb and colleagues (2015) suggested that the NSW model of soil governance is characterised as dispersed and fragmented across different government agencies, strategies and legislative instruments. Considering the critical role that soils play in the state’s economy – in 2018-19, NSW’s gross value of agricultural production rose to \$11.7 billion, contributing almost one-fifth of Australia’s gross value of agricultural production (Weragoda & Duver, 2021) – and in supporting, regulating, maintaining and provisioning ecosystem services, the regulatory landscape for soils appears to be inadequate. For a long time now, scientists have been claiming the need for a modern and coherent policy approach (Chapman et al., 2011) that overcomes this fragmentation and that is better suited to tackle the complexity of the problems the state is confronting.

This chapter has two parts. The first part examines the trajectory of soils as a policy problem in the NSW institutional arena. In doing so, I draw on Foucault’s notion of problematisation to explore the evolution of soils political ontologies and, in this way, put into question the forms in which soils have been considered and addressed by the state across time. The aim is to make politics visible and identify particular shifts in thinking with the concomitant de/politicising strategies. The second part analyses a failure at attempting to re-politicise soils with a new policy proposal in 2011 by focusing on the political ontology embedded in the policy framing. Building on empirical evidence, I seek to address the following research questions: how has the problem of soil degradation been framed in the past in New South Wales, and how were those framings created? What soils

political ontologies are embedded in these framings, and how do they relate to the deployment of de/politicising strategies? What potential order of human-soils relationships sought to be actualised in the policy proposal *Looking Forward, Acting Now*? How does this political ontology account for the policy outcome?

5.1 Problematising soils de/politicisation

In this section, I further elaborate on the political ontological dimension of the PoFF introduced in Chapter 4.1 and focus on its relationship with de/politicisation. More specifically, I contend that examining political ontology or the ontology of the political in certain issues (e.g., environmental problems) with a historical perspective is an entry point to understanding the contingent character of de/politicisation processes. Thus, the argument is that depoliticisation is not an inescapable societal condition but susceptible to being challenged and reversed. In the previous chapter, it was pointed out that inquiring about political ontology(ies) opens up the opportunity for questioning the order established by institutionalised politics, creating spaces for potential (re)politicisation by surfacing alternative imaginaries of social-ecological orders. For this to occur, the existing order of things has to be denaturalised and its ontological grounds problematised by “turning a given into a question” (Foucault, 2019, p. 416).

Problematisation, Foucault (2019, p. 417) explains, is a critical analysis “in which one tries to see how the different solutions to a problem have been constructed; but also, how these different solutions result from a specific form of problematization” (Foucault, 2019, p. 417). Problematisation is a critical inquiry that unveils how objects come to be, which entails examining the historical process of the production of problems, the conditions of their emergence and their transformations (Bacchi, 2012). As Foucault argues, it “doesn’t mean the representation of a pre-existent object, nor the creation through discourse of an object that doesn’t exist. It is the set of discursive or nondiscursive practices that makes something enter into the play of the true and false and constitutes it as an object for thought” (1989, pp. 456–457). In other words, problematisation is an

inquiry into the ontology of problems as they come to be known and responded to by people in a certain socio-historical context (Pellizzoni, 2016). This critical engagement with ontology, according to Rosenthal (2019, p. 253), “can make the democratic public mindful of the biases and exclusionary implications of the dominant view and open up reflexive space to experiment with other options”.

As outlined when introducing the PoFF in Chapter 4.1, a political approach to ontology emphasises the contingent nature of grounding processes in the social, and therefore, every attempt at grounding *being* (or essentialising, totalising, universalising) is political⁵³. Building on the post-foundational school of thought, political ontology does not deny the existence of a ground (as in anti-foundationalism) but of an *absolute* ground, installing in this way “an ethos of constant interrogation of metaphysical pretensions to foundations and contest their ‘identitarian’ status” (Paipais, 2017b, p. 12). The premise of the undecidable character of ontology not only challenges metaphysical foundationalism but also exposes, as McNay (2017, p. 524) argues, “the constructed, incomplete character of entrenched social objectivity”. By proposing the withdrawal of transcendental grounds, political ontology renders the political difference as the privileged domain of ontological exploration. The political difference postulated by Marchart (2007) – between “ordinary” politics and the contingent realm of the political explained in more detail in Chapter 4.1 – suggests that the political cannot be grasped directly since it is always mediated by the ontic level of politics⁵⁴. Therefore, political ontology foregrounds a mode of thinking that is not concerned with the accuracy of what can be known but with the political ways in which we think; thus, it proposes “to politicise thought” (Marchart, 2018, p. 158).

⁵³ As Marchart (2007, p. 171) claims, this position attributes to political thought the role of a *prima Philosophia*, instead of attributing it to, for example, aesthetics or ethics, which is “not so much a ‘philosophical’ decision based, for instance, on so-called rational grounds, as it is an intrinsically political decision”.

⁵⁴ In light of the critiques that pointed to the negative view on politics conveyed by this literature, in later work, Marchart clarified that the concept of the political does not imply a sort of superiority that undervalues everyday politics. In this regard, he affirms that “[t]here is nothing intrinsically bad about a politics in the mode of the ‘ordinary’; on the contrary, without politics, it would make no sense to speak about the political” (2018, p. 3).

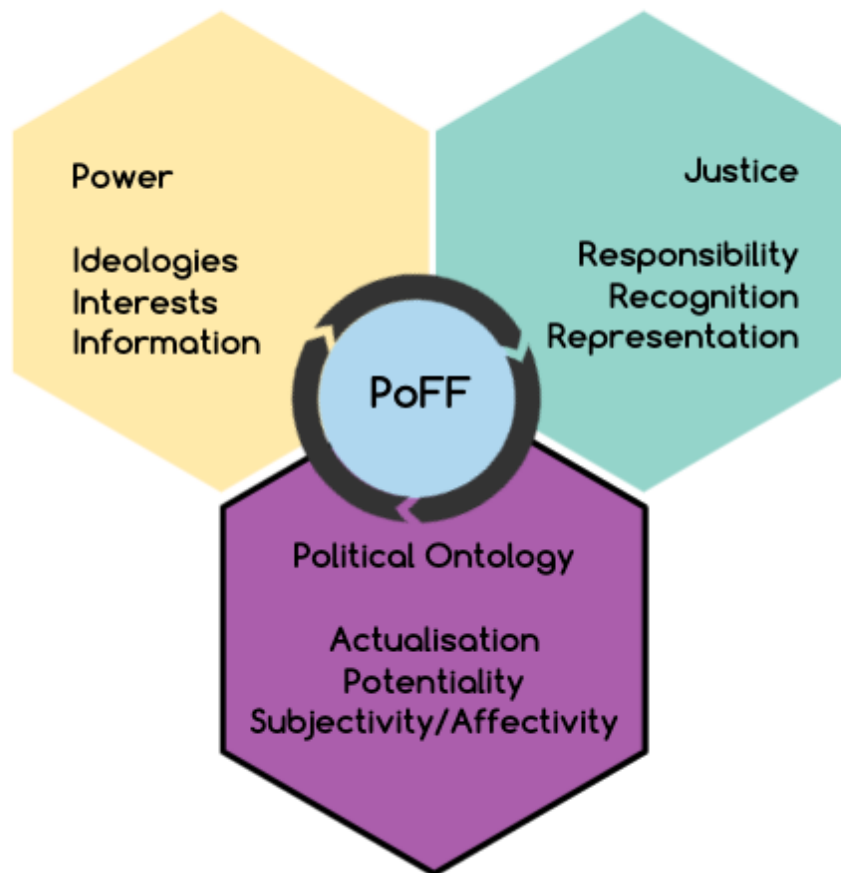


Figure 5. 1 This chapter explores the **Political Ontology dimension of the Politics of Framing Framework**. See Chapter 4 for a detailed introduction of the PoFF.

Consequently, political ontology prompts a sensitivity to question what is naturalised in the social world and search for modes of the political even in “what appears un-political on the surface” as it “may, in fact, have deep political roots” (Marchart, 2017, p. 509). The analysis of political ontology from a social-ecological standpoint should give particular attention to the conceptions of human-nature relationships that are actualised in ontic politics and the potential possibilities of other understandings that are situated in the margins of politics or in a meta-level. As Marttila (2015) points out, the political difference can be manifested only in terms of relationality: *beings* or entities are not self-referential but built in the interrelationship with others. Entities’ meaningfulness, he argues, results from the

“incessant play between the possible (i.e., the potential) and the positive (i.e., the actualized) meanings” (2015, p. 43). Thus, he claims that the difference between the actualised and the potential meanings attributed to an object are originated in language.

Furthermore, following the work of Marttila (2015) on post-foundationalist discourse analysis, he claims that the lack of an objective condition in discourses does not mean falling into a sort of nihilism or negativity. In the process of differentiation, the mobilisation of subjectivity through the affective attachment to discourses’ representation of reality plays a fundamental role in providing them with stability. Affective support, according to Marttila (2015, p. 191), “means that subjects regard a discursive representation of reality and the related subject roles as promising and see them, for instance, as an ideal state of society and of subjective being”. For example, the normative assumptions, social and environmental values, and political goals embedded in framings elicit emotions approving or disapproving of their presumed validity. Consequently, the author notes that affective support to the diverse represented realities (actualised or potential) contributes to the stabilisation or destabilisation of an existing social order. Therefore, emotions and affects matter because they “belong to the ontological conditions of possibility of any discursive materialization of the social” (Marttila, 2015, pp. 38–39).

In synthesis, our ontopolitical stances suggest what imaginings should be enacted in the reality and which ones should be neutralised or marginalised. In this manner, political ontology is intrinsically connected to the literature on de/politicisation. Depoliticisation has been addressed in two different ways: as a systemic condition and as a strategy of governing (Buller et al., 2019). Although some scholars have pointed out that depoliticisation is not a phenomenon exclusive to contemporary politics (Buller et al., 2019; Burnham, 2017; Fawcett & Marsh, 2014; Meyer, 2020), in both approaches, it has been used as a conceptual tool of critique of neoliberal democracies underpinned by the principles of “market efficiency, economic competitiveness, public austerity and the lean state” (Blühdorn, 2015, p. 149).

The view on depoliticisation as a systemic condition is associated with the work of scholars of the post-political thought that was addressed in Chapter 4.1. To this literature, depoliticisation appears as a seemingly inescapable condition of contemporary politics. Recently, scholars have commented on this “pessimistic” perspective towards politics and the real potential to challenge and transform this dominant condition (Anshelm & Haikola, 2018; Beveridge & Koch, 2017; Buller et al., 2019). For example, Buller et al. (2019) argue that to scholars of the post-political, hegemonic (neoliberal) ideas are ingrained in such an efficient manner in social life that there is little or no margin to discuss and propose alternatives. Hereby, these scholars seem to fall back to an inadvertent and contradictory foundationalist position (despite post-foundationalist claims). In a similar vein, Beveridge and Koch (2017, p. 36) have commented that “genuine” political agency in the post-political condition is confined to rare revolutionary actions that are “inherently in opposition to agencies within actually existing politics/the police order”. This limited capacity for political action has also been addressed by Anshelm and Haikola (2018, p. 565), who argue that considering only radical emancipatory action as an expression of authentic politics “risks analytical insensitivity to the political potential in acts that may not be explicitly framed as being against capitalism but that nevertheless arise from the contradictions inherent in capitalism’s global workings”. Therefore, to some scholars, the post-political as a societal condition tends to narrow the conception of politics and political agency and overlooks the possibility for politicisation contained in any form of depoliticisation.

The literature on de/politicisation as a governing strategy provides a more dynamic understanding of the relationship between depoliticisation and politicisation and, for that reason, is more appropriate for what is intended to demonstrate in this chapter (i.e., the contingent nature of these processes). Within this stream, there are two generations of studies (Hay, 2014; Wood, 2016). The first generation (Burnham, 2001; Flinders & Buller, 2006; Hay, 2007) focused on depoliticisation as a mode of statecraft (Wood, 2016) that disguises “the political nature of the policy process” (Buller et al., 2019, p. 2). Hay (2007, pp. 261–262)

explains that depoliticisation is “the effective demotion of issues previously subject to formal political scrutiny, deliberation and accountability to the public yet non-governmental sphere”. In his view, de/politicisation processes entail the movement of issues across domains: government, public, private, and the domain of necessity (non-political)⁵⁵. In a similar vein, Flinders and Buller (2006, p. 296) claim that the political character of decision making is removed by shifting arenas and relocating issues to an indirect governing relationship persuading “the demos that they can no longer be reasonably held responsible for a certain issue, policy field or specific decision”. In their view, politicians wield a set of tools and mechanisms to achieve depoliticisation that includes: tactics of *institutional depoliticisation* that transfer decision making to independent bodies or experts’ panels, tactics of *rule-based depoliticisation* constraining decision making to explicit “neutral” and “universal” rules, and tactics of *preference-shaping* drawing on discursive and rhetorical claims to persuade that a certain issue “lie[s] beyond the scope of politics or the capacity for state control” (2006, p. 307). Consequently, by means of depoliticisation, governments displace responsibility over certain problems towards other spheres, taking advantage of “the distancing effect of depoliticisation” but without losing political power and control (Burnham, 2001, p. 137). According to Burnham (2001, 2014), strategies of depoliticisation seek to persuade relevant actors about the retreat of the state from specific areas, an apparent removal of the political in decision making, when in reality, the state continues to play a fundamental role in the reproduction of labour-capital relations to increase the accumulation of capital.

The second generation of depoliticisation studies (Fawcett et al., 2017; Fawcett & Marsh, 2014; Jenkins, 2011; Wood & Flinders, 2014) seeks to surpass the “narrow”

⁵⁵ Hay (2007) elaborated a typology to identify how depoliticisation and politicisation might occur. Depoliticisation, he argues, always implies the demotion of issues in three arenas: Depoliticisation 1 – from the governmental to the public sphere; Depoliticisation 2 – from the public to the private sphere; Depoliticisation 3 – from the private sphere to the realm of necessity (2007, p. 254). On the other hand, politicisation involves the promotion of issues across three levels: Politicisation 1 – from the realm of necessity to the private sphere; Politicisation 2 – from the private to the public sphere; and Politicisation 3 – from the public to the governmental sphere (2007, p. 254).

state-centric perspective, placing more emphasis on a wider spectrum of actors as well as on the contingent and indeterminate nature of depoliticisation and its dynamic interrelationship with politicisation (Wood, 2016). Therefore, one fundamental contribution of this literature is the role attributed to the depoliticising effects of language. According to Wood (2015), de/politicising moves can be captured discursively, as policy actors use storytelling to justify or deny the necessity of political agency, and their identification can serve to explain shifts in policy paradigms. Another critical contribution is the assumption that depoliticisation contains the elements for triggering (re)politicisation mechanisms, and thus, it is susceptible to being challenged and reversed (Buller et al., 2019; Jenkins, 2011). In Jenkins' view, "[a] strategy of depoliticization entails forming necessities, permanence, immobility, closure and fatalism and concealing/negating or removing contingency", whereas a strategy of (re)politicisation "in its broadest sense, entails exposing and questioning what is taken for granted or perceived to be necessary, permanent, invariable, morally or politically obligatory and essential". Not everything is political, but anything might become politicised insofar, as Jenkins (2011, p. 160) argues, actors use "strategies that open up contingency by exposing and undermining processes of fatalism that hold us captive".

In synthesis, problematising soils de/politicisation requires understanding what Gusfield defined as "the career" of a public problem (Gusfield, 1984) or the ways in which issues are thought about and acted upon in different historical moments. As Jenkins (2011) argues, the historical analysis of depoliticisation strategies serves to apprise their temporary and conditional status and, thus, to inform politicising strategies that could undermine them. Thus, the aim is to interrogate how soils have been addressed in the policy arena and how political ontologies have been articulated with processes of de/politicisation. This chapter will analyse the trajectory of soils in NSW's institutional context to provide an example of the dynamic relationship between politicisation and depoliticisation processes and how shifts in discourses and practices have been mobilised over time to support the promotion or relegation of the state's responsibility.

5.2 The career of soils in the NSW policy arena

This first part of the analysis of the empirical data examines the trajectory of soils as a policy problem since their inclusion in the institutional context with the passing of the Soil Conservation Act in 1938 until a window of opportunity for developing a contemporary soil policy opened in 2009. The second part will explore the soil policy proposal “NSW: Looking Forward, Acting Now” between the years 2009-2011 from a political-ontological perspective.

Information was generated through qualitative interviews and document analysis. Participants were selected based on their trajectory as public servants in the soil sector of NSW’s government and by their level of involvement in the policy design process. Reconstructing the past is a significant challenge (Aukes, 2017), but the interviewees were highly engaged in the development of the proposal and thus had clear memories of the process. Following a snowball sampling technique (Bryman, 2012), the recruitment started by approaching members of the Soils Policy Working Group that oversaw the development of the NSW policy. Some members were staff of the NSW Department of Primary Industries (steering the process), some represented other NSW Government stakeholder agencies, and some were appointed to develop specific policy components. The first recruited participants suggested others who were also directly implicated in the process or were regarded by them as relevant to this research. Seven in-depth interviews were conducted with soil experts and government officials of NSW who were directly involved in the process of developing the soil policy proposal “NSW: Looking Forward, Acting Now” between the years 2009-2011. Public documents were reviewed (legislation and official reports) related to soil governance in NSW. The main documents analysed were: • the Soil Conservation Act (1938), • the policy draft NSW Soils Policy Looking Forward, Acting Now (2011); • the NSW Soils Policy: Draft Action Plan (2011); • and official reports elaborated by government agencies such as Environment Protection Authority New South Wales State of the Environment 2009 and 2015.

5.2.1 Soils politicisation: reversing degradation and securing food production

It is well documented that since the arrival of the first Europeans in Australia, the interaction of settlers with the soil resource has been problematic. The lack of knowledge about the unique characteristics of the Australian soils, climates and landscapes and the consequent use of inappropriate techniques for growing food unleashed many land degradation problems and processes (Campbell, 2008). The ecological violence of colonialism worsened soils natural conditions, previously in balance with indigenous land management practices (Horton, 2000; Iles, 2021; Williams, 2015). As a result, degradation dramatically accelerated in a time frame that spans almost 150 years, leading to erosion, decline in organic matter, salinity problems and loss of native vegetation (Koch et al., 2015).

Though some legislation related to soil management appeared early in the 20th century in NSW, Webb et al. (2015) explain that it was mostly concerned with tenure rather than conserving soil resources. By the 1930s, the acute soil erosion problems affecting NSW guided the state government to appoint an Erosion Committee whose research identified that erosion was widespread across all farming and grazing lands (Research Data Australia, n.d.). Although there is no consensus on whether the drought of “World War II” that started in 1937 (and lasted until 1945) was caused exclusively by poor land management practices or extreme drought conditions – or both – (McTainsh et al., 2011) it was a decisive event to change the institutional context for soils. In addition, the frequent dust storms that affected the state in the 30s that coincided with the Dust Bowl in the United States, and the catastrophic images in the newspapers of the widespread effects, contributed to shaping public opinion and provided economic justifications for creating new legislation (Bailey, 2016; Jones, 2018). As Whatmore (2013, p. 45) claims, in the social domain, things and non-human natures are more powerfully registered in moments of ontological disturbance that “forces people to notice the unexamined stuff on which they rely as the material fabric of their everyday lives and attend to its powers and effects”.

The NSW Soil Conservation Act (SCA) that came into force in 1938 defined as its primary goals, “ensuring the conservation of the soil resources of the state, the mitigation of soil erosion and land degradation and the conservation of water resources”. The enactment of the SCA manifests an emergent political awareness of degradation threats and a change in the government’s approach by assuming the responsibility for leading conservation actions and guiding the community attitudes “rather than reflect them” (McTainsh et al., 2011, p. 18). This piece of legislation was not only pioneering for its time – it was the first of its kind in Australia and the second one in the world after the United States (Jones, 2018) – but remains today the most important instrument regarding soil protection in NSW (DPI, 2011a). Furthermore, the SCA provided the institutional scaffolding for its operational arm, the Soil Conservation Service (SCS) (Webb et al., 2015). What is more, the SCA provided “the initial input work about what had to be done, set up the rationale”, as a participant observed, and would remain relatively unchanged until the 1980s (Hannam, 2020).

In the five decades that followed the creation of the SCA, as an interviewee explained, “soils went through a long period of crescendo” [Exp1], until the removal of the SCS in 1991. The participant explained that during those years, “soil conservation work was building up in NSW, there was research, there was extension, there were works on the ground, there were publicly funded programs for mitigating soil erosion badly increasing in farmlands”. Even during the years of the Second World War, when most public resources were put into the war efforts, the SCS continued to be funded because, as an interviewee stated, “there was a strong sense of sustaining the rural base mainly to maintain food supply” [Exp2]. This support of the state for soil conservation coincided with a strong national politics and culture of interventionism in the agricultural sector that lasted until the introduction of a new economic rationality in the public sector in the 70s that prioritised free markets and deregulation processes, a tendency that would be intensified in the following decades (Botterill, 2005; Iles, 2021). Agricultural practices were progressively improved and adapted to local conditions (McTainsh et al., 2011) by, for example, introducing the principles of conservation agriculture

that include minimum tillage and soil disturbance, retention of crop residues, and rotation of crops (Bellotti & Rochecouste, 2014; Ward & Siddique, 2015).

Although voluntary and educational approaches were mainly adopted by the provisions of the SCA, it also provided “coercive powers” to the SCS, particularly by giving a certain degree of arbitrariness in the selection of private properties in areas of erosion hazard to conduct demonstrations and experimental projects (Campbell, 1948; Looney, 1991). According to Jones (2018, p. 20), the policy intent behind the elaboration of the SCA was to create a co-operative partnership between the SCS and landholders rather than establishing a “highly coercive scheme”. Nevertheless, a former government official noted that,

“[The SCS had] extraordinary powers that included that they were able to direct landholders to do pretty much anything to sort out soil erosion problems. Or if the landholder didn’t do it, they were able to go on and do it themselves, and they’d send the landholder the bill for the works that they did. So quite extraordinary powers” [Exp7].

The SCS built capacities inside and outside the organisation and developed an integrated approach to soil conservation (Hannam, 2020) by articulating scientific knowledge, on-the-ground works and engagement with the community. To most interviewees, the SCS attracted a lot of attention within the government due to its efficiency in delivering results and the good working culture. Furthermore, it became internationally recognised (Hannam, 2020). Regarding the “success” of the organisation, a former SCS staff member stated:

“The old soil conservation service was a beautiful service because it was all beautifully vertically integrated, there was a really good and very active management, the executive had very good interactions with ministers and with the staff, there was a group of scientists who did a lot of really good research, particularly on soil erosion, there was a really good group of extension officers who also did some science, so there was sort of a crossover between the group of scientists and the extension people” [Exp2].

Soils were politicised as a response to a context of ecological crisis in which policy actors determined that beyond the natural factors that were causing degradation (e.g., wind and water), continuing with the same trajectory of soil management could lead to dramatic economic and ecological consequences such as those of the US Dust Bowl. Against a background of high rates of erosion, drought and recurrent dust storms that represented a menace for food production and for the agricultural sector at large, farming practices had to be rethought. As a governmental strategy, the enactment of the Soil Conservation Act amplified the scope of politics by including a new domain of decision making, one of the first in natural resource management in the country (Hannam, 2020). The SCA, articulated with the SCS, created an innovative resource conservation regime for its time (Jones, 2018), which was characterised by expert-driven science and advice, decentralised activities (Bailey, 2016) and close collaboration with farmers and pastoralists (Hannam, 2020).

Confronted with an overall ecological decline, the government of NSW brought soils into the policy domain by recognising the impacts that unsustainable practices had caused – beyond the already challenging natural conditions. Consequently, in the next five decades, soil conservation was supported politically and financially primarily through extension and education programs. A productivist ontology of soils as an exploitable resource pervaded the political approach of both Labor and Liberal governments that sought to sustain and enhance agricultural production by restoring damaged soils. As a result of the constitution of this particular order of human-soils relationships that draw upon the advances of western scientific knowledge, acute erosion problems were effectively answered. In contrast, some of the most pervasive and less visible and known problems – e.g., acidification from legume ley pasture systems (Kemp & Dowling, 2000) – are part of the challenges the state faces today. Furthermore, this order was beneficial for farmers whose incomes were improved as well as the state that saw an increase in revenues from agriculture (Jones, 2018). Despite the relevant work conducted by the SCS from a political ontological perspective, this attempt at grounding soils, as post-foundationalist would argue, can never be

complete. The strong rural and productivist approach to soils excluded other political ontologies, such as indigenous land management. Furthermore, the publicly funded extension and research would trigger a process of soil depoliticisation justified by a new politico-economic context that will be explained in the next section.

5.2.2 Soil depoliticisation: displacing responsibility

Coinciding with the introduction of New Public Management reforms⁵⁶ and the expansion of the neoliberal rationality, the beginning of the 1990s inaugurated the displacement of soils in NSW's institutional landscape. Three strategies of depoliticisation progressively removed the political responsibility on soils: 1) institutional depoliticisation with the dissolution of the SCS, 2) rule-based depoliticisation with the transition towards integrated Natural Resource Management (NRM), and 3) preference-shaping depoliticisation with the emergence of a new environmental agenda that shifted priorities.

The first decisive factor was the dissolution of the SCS and the fusion of its remnants with the Department of Lands (DL) in 1991, which led to the creation of the Department of Conservation and Land Management (CaLM). Interviewees commented that by the beginning of the 90s, there were claims in government that the SCS had “reached its potential”, that it “had done its job”, and it was “time to transfer its good culture to others”. Moreover, there was a perception that the most urgent “visible” soil problems were already fixed through engineering works – but this standpoint overlooked the insidious nature of many forms of soil degradation (e.g., decline in soil structure, nutrient loss, acidification, etc.):

“In a sense, it is possible that by the end of the 1980s, there were people out there saying, ‘well, we don’t see any new control banks going in, we don’t see any new effluents going in’, all these sorts of activities that were

⁵⁶ According to Clune and Smith (2019, p. 214), the reforms that started in 1988 in NSW involved “the abolition of the Public Service Board, decentralised public service recruitment and greater ministerial control over senior public servants”.

associated with soil-conservation, they are not happening anywhere, it didn't appear any obvious erosion so perhaps they thought, 'we don't need it, we fixed that problem, we can move on to some other problem'" [Exp2].

The dissolution of the SCS initiated what an interviewee described as "a path of continued amalgamations and metamorphoses" [Exp1] of the former SCS staff and programs. The fusion of the SCS with the DL meant a significant downsizing of the former, and as a result, most of the work done by the service was "watering down amongst many other priorities", as Exp6 expressed. Symbolically, as a former senior soil government official noted, the disappearance of the word "soil" from the newly formed Department of Conservation and Land Management in 1991 and the word's exclusion from the names of future agencies and departments where soil issues pertained contributed to making this resource less visible in the policy arena. In his words, "you can see already that the word "soil" starts to disappear; this is important context" [Exp1].

Though most of these institutional changes occurred without any physical register, at least six mergers (represented in Figure 5.2) can be identified from participants' discourses coupled with official information on websites and documents. Moreover, it had significant consequences for soil governance in NSW because, as Exp1 said, with "every manoeuvre, every change, you had the diminution of the soil issue". After the SCS of NSW was dissolved, there were no more soil conservation programs or dedicated agencies in Australia (Campbell, 2008). Consequently, the progressive retreat of the government from the traditional extension role resulted in an increase in public/private partnerships, public/private benefit decision making, and private provision of services (Hunt et al., 2012). As an interviewee explained,

"So also, what happens, and this is quite a good political trick too, is starting things like Landcare, which was meant to be a grassroots democracy, giving money to the Catchment Management Authorities which are run by the local head boards and so forth, [...] so you don't have

to have a national or state policy or anything like that because the CMA is just doing its thing on its own” [Exp4].

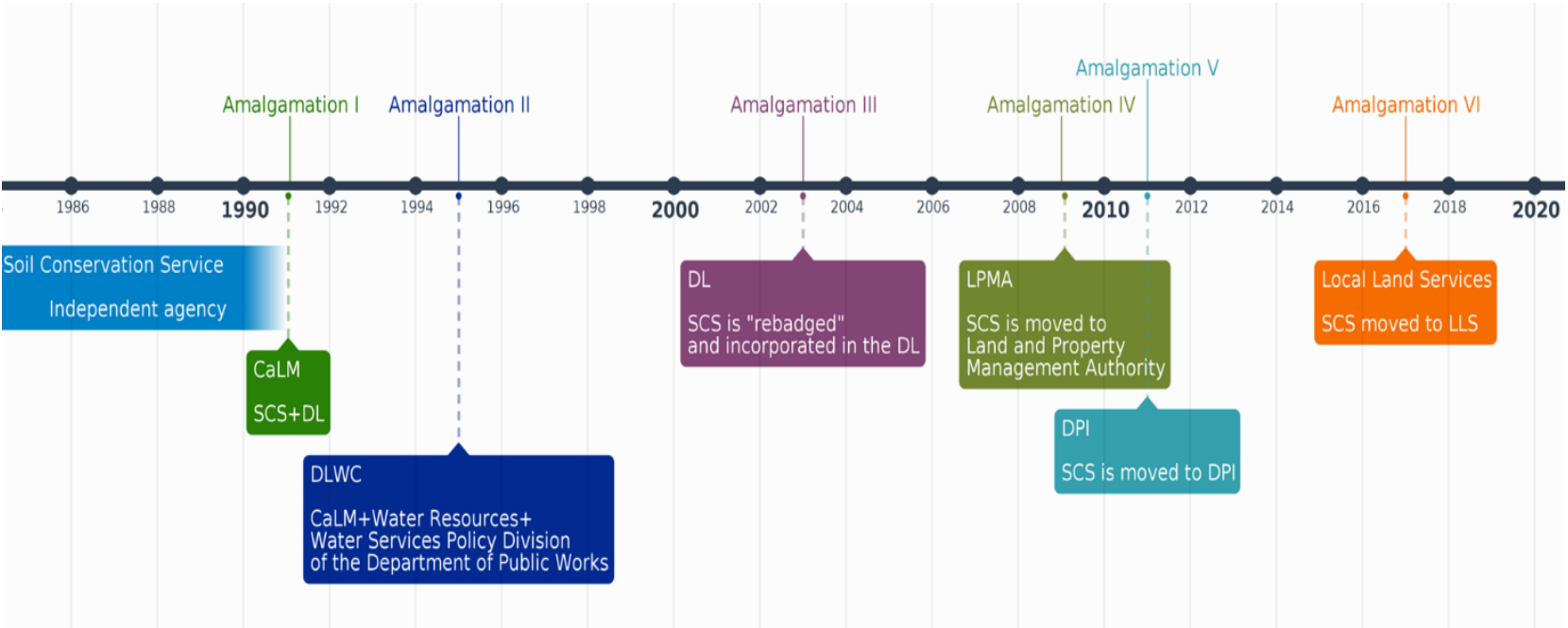


Figure 5.2 Timeline of the metamorphoses and amalgamations of the Soil Conservation Service.

Source: This research

These institutional changes converged with a shift in environmental thinking from silos or single issues to integrated NRM schemes. As Hannam (2020) argues, in the 90s, most Australian states following the new national agenda on environmentalism (i.e., the Intergovernmental Agreement on the Environment, 1992) went through a process of policy reforms in “the areas of water, vegetation, environmental assessment, environment protection, land planning, and pollution management and with a greater focus on integrated natural resources legislation”. Furthermore, he claims that soils laws were not part of this reform, and they kept a subordinate role⁵⁷ “to the integrated natural resources laws in environmental assessment, planning and management” (Hannam, 2020). Soils were regarded as reductionist (compartmented) scientific thinking, which was no longer considered efficient (Hunt et al., 2012) and began to be dealt with institutionally at the catchment and landscape scales with the creation of the Catchment Management Authorities (CMA) in 2004⁵⁸. According to Hannam (2020), “[t]his approach is more effective in being able to manage the total environment”. However, to most participants, this new management paradigm provided further reasons for the reduction of soil expertise in the public sector affecting the capacities to effectively integrate soils into these frameworks. Although former employees of the SCS understood and managed the landscape scale, as Exp2 mentioned, the mere fact that they worked “under a banner of soil” relegated them to a no longer functional silo. Another participant suggested that a problematic aspect of this management frame sustained on discourses of improved efficiency and holistic thinking is that it is difficult to maintain equitable amounts of attention to all the interrelated parts and processes within a system. As he said,

⁵⁷ Hannam (2020) explains that soil-related legislation is classified into three categories depending on the degree of their contribution to soil conservation goals: category 1 corresponds to “specialist soil conservation laws” (e.g., SCA); category 2 belongs to integrated environmental legislation that currently “performs the major legislative responsibilities for soil conservation”, and category 3 legislation supports soil conservation actions in specific areas such as bushfire management, forestry, mining, etc

⁵⁸ In 2003, the Catchment Management Act was passed, and in 2004 thirteen Catchment Management Authorities were established across the State of New South Wales, replacing 72 NRM committees (Pannell et al., 2004). A decade later, CMAs were converted into Local Land Services (LLS).

“[y]ou need to get efficiencies, but there’s a cost to that. Once you start operating in an integrated way, it is very easy to lose your skill base of one of those disciplines, and the soil was the one that actually tended to crumble away” [Exp1].

In this vein, Campbell (2008) argues that although NRM issues have gained broader attention since the mid-90s, “the connection of soil to urgent issues such as climate and water has been largely forgotten or ignored”. Thus, soils became the neglected resource of the new paradigm. It should be noted that despite this progressive marginalisation of soils in the NSW institutional context, the Australian Government made significant investments in NRM programs such as the National Landcare Program. This program not only “proved to be popular” but also was “an impressive achievement” in terms of “building networks, raising awareness, and changing attitudes” (Salt, 2016, pp. 94–95).

In addition to these transformations, in the 1990s, new environmental priorities such as water and air quality, flora and forestry emerged, gaining popularity in the mass media and the policy context. In particular, this was the case for biodiversity issues that captivated the attention of policymakers who passed the Threatened Species Conservation Act (1995) after the approval of the Convention on Biological Diversity at the Rio Summit in 1992. As a result, public efforts turned towards new directions, as highlighted by one of the participants: “all of a sudden, biodiversity became ‘the thing’, and it is quite justified and needed to happen, but plural soils agenda started to sleep”. The changes in environmental policy priorities had their correlate with public as well as private funding affecting the investment in soil issues (Campbell, 2008). In this regard, Exp6 mentioned that the budget for soil conservation activities as well as specialised staff “has just been cut and cut and cut”. So, whereas the public profile of other pressing environmental issues was on the rise in the 90s, soils were becoming gradually less visible and with declining human and financial resources.

Depoliticisation as a governmental strategy is “often referred to as ‘an act’” that demotes an issue from the government (Fawcett & Wood, 2017, p. 219), operating

as a response to politicisation (Anshelm & Haikola, 2018). Therefore, such demotion is intrinsically related to shifts in political thinking about public problems. Although soils remained socially meaningful as productive resources, the regulation of human-soils relationships was transformed by transferring the responsibility for conservation actions outside the public sector. As analysed in this section, soils displacement occurred in three sub-acts. First, a process of institutional depoliticisation that started with the dissolution of the independent government agency specialised in soils and the progressive relegation of conservation activities to communities and the private sector (farmers, Landcare groups). Depoliticisation of this sort is, according to Flinders and Buller (2006, p. 300), the most common type according to which decision makers legitimise the transference “of power and responsibilities beyond the conventional political arena”. Second, a form of rule-based depoliticisation unfolded with the inclusion of “comprehensive, integrated resource laws” to the already existing soils legislation that placed soils in a secondary position, complementing primary environmental legislation (Hannam, 2020). Third, preference-shaping depoliticisation displaced the public focus on soil conservation, which had been a priority environmental issue for decades, and relocated it into the new environmental agenda that prioritised other critical environmental issues. These combined strategies of displacement resulted in the progressive “de-responsibilisation” of the state and the marginalisation of soils from the policy arena. This situation has remained unchanged despite an attempt at re-politicisation with the development of a new soils policy addressed in the following sections.

5.2.3 The formation of a policy window

Towards 2009, a window of opportunity opened in the political system to put soils back on NSW’s institutional agenda. According to Kingdon’s (1984) Multiple-Streams Approach (MSA), policy windows open in specific moments of time when three streams converge: policy, political and problem. These variables run in a somewhat independent manner until a “critical” moment brings them together

(Béland & Howlett, 2016). Between 2005 and 2009, the conditions for a policy change in the public soil space started being slowly moulded. When the “Red Dawn” dust storm occurred in 2009, it prompted the establishment of a multi-agency Soils Policy Working Group to develop a coherent and contemporary soils policy proposal for NSW.

In the *policy stream*, which is composed of policy communities of specialists, ideas and proposals around a problem, which are developed and scrutinised according to certain criteria, a key factor was the adoption of the thirteen state-wide NRM targets⁵⁹ in the NSW Government State Plan of 2006. Two of those NRM targets were dedicated to soils: “Target 10 – by 2015 there is an improvement in soil condition”; and “Target 11 – by 2015 there is an increase in the area of land that is managed within its capability”. The State of the Environment Report of NSW (EPA, 2009) outlines that this implied “significant changes to the management of soils in NSW”. According to one of the participants, working at the time in the Department of Lands, this “blueprint” developed under the Labor Government in 2006 was an important driver to work on a new soil policy. As he explained:

“We needed to have direction in some of the things we were trying to do, we needed targets, and we needed to achieve them by this time. Part of that was the delivery of natural resource outcomes [...] Fortunately, there was a blueprint target for soils; we needed to have a policy for soils” [Exp1].

In addition, the development of the State Plan in 2006 coincided with a period of increasing federal investment in NRM programs. Hajkowicz’s (2009) analysis of the evolving focus of Australian NRM initiatives identifies three distinct phases in which there was an estimated expenditure of A\$ 6.5 billion between 1990/91 and 2013. The first phase focused on “raising awareness and changing attitudes” with, for example, the creation of the Landcare program⁶⁰, the second one was oriented

⁵⁹ The thirteen NRM targets for NSW, as well as a Standard for Quality Natural Resource Management, were set by the Natural Resources Commission in 2005.

⁶⁰ The National Landcare Program was an independent program between 1989 and 1997, then it became a subprogram of the National Heritage Trust 1 (1997-2001), followed by National Heritage Trust 2 (2002-2008) (Tennent & Lockie, 2013). Other relevant national NRM programs include the

to “building new institutional capacity” through the establishment of regional bodies such as the thirteen CMAs in NSW, and the third one focused on research and trial of “direct payments” to farmers through Market-Based Instruments (MBIs). In Hajkowicz’s breakdown of the Australian Government expenditure, he observes that it “increased by 240 per cent from A\$ 1.7 billion in 2001/02 to A\$ 4 billion in 2006/07” (2009, p. 472). This investment was reflected at the state level where, for example, in NSW, the budget report of 2008-09 estimates that the total expenditures for the environment and natural resources area were approximately \$1.8 billion, showing an increase of 53 per cent since 2004-05 (NSW Government, 2009).

The other critical factor for the formation of this policy window is found in the *political stream*, which in the MSA refers to the driving forces advocating for a particular policy change. To some of the participants, the role of a high-profile senior bureaucrat was fundamental in pushing forward the soil policy. By the time the NSW Government State Plan of 2006 was released, the Director-General of the Department of Lands and Soil Conservation Commissioner, who was a former “soil-con”, saw an opportunity to revitalise the SCS organisation that had been under his purview since 2003. The decline of public extension services minimised the role and activities of the SCS that around those years were “pretty much tied to community service obligations” (e.g., performing earthworks), putting at risk the accumulated expertise and knowledge amongst the public sector staff, as a participant observed:

“[He] recognised that it needs to be some other components apart from doing these earthworks because they were just withering on the vine. He could see that they were riding to a wall; that process would basically lead to the death of a great part of the Soil Conservation Service. So, they wanted to reinvigorate the NSW soils policy” [Exp6].

National Action Plan for Salinity and Water Quality (NAP, 2000-07), Caring for our Country (CfoC, 2008-13; 2013-18), and a new version of the National Landcare Program (2014-18; 2018-23).

Another participant pointed out that he was also “churning on some of his staff who were ex-soil conservation people, and also keen to get an NSW soil policy on the agenda” [Exp5]. All these factors contributed to building momentum for soils in the political stream. According to Exp5, his “strong leadership” coupled with NRM targets for soils resulted in gaining sufficient support at the executive level of the government.

Finally, it was the *problem stream* that effectively triggered the opening of the policy window. In this stream, as the MSA approach asserts, attention to a certain issue or event increases due to focusing events such as environmental disasters, recognising the existence of a pressing problem. A problem reaches the decision agenda when policymakers are aware of the problem, and they reach an agreement to act because the solution is within the government’s responsibility (Willemsen, 2018, p. 218).

In terms of agenda setting, the process of problem politicisation depends, as explained in Chapter 3, on moving issues across agendas: from the systemic agenda that refers to all issues that are usually perceived by political actors as deserving public attention and as concerning matters within the legitimate jurisdiction of governmental authority, to the institutional agenda that corresponds to the list of issues explicitly up for the active and serious consideration of authoritative decision makers (Birkland, 2005). Zittoun (2016) explains that the systemic agenda is a more abstract concept than the more empirical institutional agenda, and while the latter is shaped by policy actors, the former is shaped by researchers. Since the year 2000, the scientific community has provided evidence to the NSW government that soil issues need to be addressed. As a participant observed,

“[b]asically, every single report has got red lights for things like soil condition, and the way land is being managed, soils are on a damaged trajectory as far as the condition is expected to be in the future. And that is bad and is getting worse in a lot of cases, the majority of cases, but there is nothing happening” [Exp6].

And yet it was again the emergence of an ecological crisis that gave the necessary impetus to act, making all the streams converge. In 2009 the “Red Dawn” dust storm, which carried through the air particles of soil from deserts of Central Australia, became a major environmental issue raising public concern. As Engel-Di Mauro (2014, p. 2) claims, “[t]here is an awareness that something is wrong when soil is out of place”. The storm occurred towards the end of the Millennium Drought and contributed to both heightening the profile of soils and altering perceptions regarding the necessity of public intervention within policy circles (Gonzalez Lago et al., 2019). The Red Dawn had important repercussions on the state’s finances, with an estimated economic impact of A\$299 million, 30 times the annual standard cost to Australia of dust storms (Koch et al., 2015; Tozer & Leys, 2013). In addition, the outstanding media coverage heightened public awareness of the issue, as a participant stated, “it was all through the news when it happened [...] so that dust storm was certainly a catalyst [for the policy]” [Exp4]. Historically, dust storms that reach Australian cities have been largely portrayed in the mass media as connected to soil degradation issues (Jones, 2018). The dust storm that reached Sydney in September 2009 was, according to scholars, the worst on record since the collection of reliable data began in 1940 (Leys et al., 2011; Li et al., 2010). Accordingly, the shocking event that “choked Sydney” hit the headlines of national and international media outlets, helped to gain political traction and harness the crisis because, as an interviewee expressed, “dust storms are of value to influence the broader population because they are a very visible indication of something wrong with our soil system or our soil management” [Exp4]. Overall, the confluence of these three streams opened the opportunity for a policy change in NSW.

5.3 Exploring a failed attempt at re-politicising soils with a political-ontological lens

In what follows, I will introduce the proposal for a soils policy in NSW, which was developed in the subsequent years to the policy window opening. The opportunity

to promote a policy change by framing soils as a subject requiring government protection lost traction after the state's elections in 2011, and the draft eventually fell between the cracks. Using the PoFF, I will articulate an explanation for the dismissal of the proposal.

5.3.1 The soils policy proposal "Looking Forward, Acting Now"

The new soil policy proposal for NSW was designed through a cross-sector collaboration led by the Department of Primary Industries to set "the direction and strategic vision for the management, protection and, where possible, the improvement of soils in NSW" (DPI, 2011a). It proposed to address soil issues with a "contemporary, long-term and integrated plan to reduce and reverse the adverse impacts of soil degradation and overcome the impacts of past, and some current practices that threaten the physical environment and the social wellbeing of the state" (DPI, 2011a).

The policy was elaborated by the NSW Soils Working Group integrated by the former Land and Property Management Authority, the Department of Environment, Climate Change and Water, Industry and Investment NSW, the Department of Planning, NSW Catchment Management Authorities and NSW Treasury (DPI, 2011a). Also, renowned external experts in soil science, policymaking and legislation contributed to drafting the policy. On this matter, Exp5 stated that the soil policy was developed in "a fairly exhaustive process" involving the "whole-of-government" (DPI, 2011a). Furthermore, it was backed up by the top levels of the hierarchy, "it was put together with the agreement of the Directors General of these various departments and with the agreement of the ministers" [Exp5]. Therefore, during a short period of time (2009-2011), there was a certain level of agreement about the proactive role that the state should perform in steering the governance of soil resources.

Participants representing the different agencies were handpicked to contribute to developing specific aspects of the policy. Moreover, some components of the document were strictly commissioned to experts in specific matters, e.g., soil carbon sequestration and climate change. The policy draft was put together by the

appointed coordinator in consultation with the rest of the participants “around the table” in an iterative way “based on meetings and writing” [Exp1]. To add credibility to the process, three meetings with stakeholders were held in Dubbo, Sydney, and Tamworth, as a former soil government official explained:

“We invited landholders who had an interest in this sort of thing; we also invited the local stakeholders, whether they be Catchment Management board members and participants, where there was a farmer advocating carbon management, let’s get them along to see what they have to say” [Exp1].

Despite some difficulties that derailed the process (particularly the conflict of interests between the two agencies with competencies on soils), the working group arrived at a final draft in 2011. The goal of the policy was “to improve soil condition and productivity and increase the area of land that is managed within its capability, by promoting sustainable use and management of soils, and providing a framework for coordination and collaboration across all stakeholders in NSW” (DPI, 2011a). In so doing, it proposes to address soil issues with a more comprehensive approach, fostering best practice management models, and supporting collaboration across the community between public, private and research sectors. Moreover, it delineated the roles and assigned responsibilities of the different agencies within the government, the private sector, and communities. For this reason, to interviewees, the draft assumed a holistic perspective not only in the scientific approach to soils that included the interconnected functions and process with other environmental media and forms of life but also since it “was a policy as well as a strategy because it got into the actions, and it allocated responsibilities to various organisations whether they be rural based or government based” [Exp2]. Furthermore, one of the participants explained that the proposal appealed to the rearrangement of existing funding and cooperation between agencies in the natural resources side of government (especially those concerned with soils) seeking “to create efficiencies amongst existing funds and synergies and collaboration between agencies to make the most of what is available” [Exp1].

Figure 5.3 below shows the five main objectives of the policy coupled with their respective strategies (22), which were also broken down into specific actions (71).

In 2011 the Government of NSW changed after the elections, and the Liberal-National Coalition defeated the Labor Party that had governed the state since 1995. The impetus to re-politicise soils ended, and the interest in endorsing the proposal “just evaporated”, as Exp5 expressed. Though the actors involved in designing the soil policy pushed the draft forward, it was not received positively by the new government, and as time went by, the policy became outdated, providing a further loss of motivation for its implementation. As an interviewee stated, “it just sort of died a slow and painful death” [Exp1]. Policy windows are short-lived and occasional (Rose et al., 2017), and the sense of urgency and the public commotion triggered by the dust storm was long passed by the time authorities changed. This example also reaffirms the claims that time constraints defined by political cycles are critical boundaries for action and managing timing norms is essential for mobilising strategies (David, 2019). Overall, the political support for the cause was strongly personalised, rendering it fragile and sensitive to shifts in power. The re-politicisation strategy aimed to bring back soils to the political agenda against a background of marginalisation of soils issues with the concomitant decline in scientific soil knowledge within the public sector at the time that new environmental frameworks were reconceptualising human-soils relationships (e.g., ecosystem services).

Chapter 3 of this thesis elaborated on a potential explanation for the failure to re-politicise soils in NSW. However, until now, the causes that led to shelving this policy remained largely unexplored. Albeit, at first sight, there is no consensus amongst the actors interviewed for this study about the reasons that led to turning down the proposal (apart from the obvious one – the shift in orientation and priorities of the incoming government) in the following paragraphs I will seek to articulate a more detailed explanation based on the political ontology of soils embedded in the policy framing.



Figure 5. 3 NSW Soils Policy Looking Forward, Acting Now approach to soils management: Objectives and Strategies.

Source: Adapted from DPI, 2011b.

5.3.2 Soils political ontology: ‘the glue that binds’ all terrestrial ecosystems

In the policy document, soils are portrayed as one of the most important natural resources, “critical for life on the planet”, “essential for the conservation of

biodiversity”, a “key component of all terrestrial ecosystems”, and fundamental for “the maintenance of global water, food and nutrient cycles” (DPI, 2011b). As explained earlier, since the introduction of integrated management legislation in the 90s, soils specialised regulations became secondary “and only used to guide practical conservation or repealed and their main functions incorporated within a comprehensive integrated resource law” (Hannam, 2020). In this regard, an interviewee reported that the SCA became a “sleeping legislation, rarely visited and hardly utilised at all” [Exp1]. Furthermore, the SCA has never been substantially reviewed over time. Against this background, those involved in the development of the proposal sought to raise soils from a subordinate to a priority position in the regulatory landscape of natural resource management. Drawing on the fundamental role they play in the support and maintenance of terrestrial ecosystems (DPI, 2011b), a participant observed that soil policy should be the one informing “the direction for other legislation or other instruments that also incorporate soil”. More specifically, he mentioned that,

“[...] what the policy document is doing is trying to reset that [various laws, acts and regulations related to soils issues] in a prime framework that encompasses all of these different regulations and places a set of priorities that should govern everything. So, if there are any conflicts between different legislation, we’ve then got an avatar in the form of soil policy [...] if there is a conflict, we can go back to the soil policy to provide the arbitration” [Exp2].

In addition, another former soil government official said that a comprehensive soils policy like this one is necessary because it would “underpin pretty well everything, they are all-pervading, many of the natural processes and even man-made processes are governed by an understanding of the soil” [Exp6]. A soil scientist interviewed expressed that the soil is much more than an object of study; it is a matter of “passion” that “[...] even makes you happy” [Exp3]. This understanding of soils as an overarching natural resource is synthesised under the metaphor of the soil as “the glue” used by an interviewee:

“We need to focus forever on why we are doing all this. We are doing it for passion; we are doing it because we understand that the role of soils is fundamental in the delivery of ecosystem management outcomes but is being overlooked, and it is most important [...] the point that we make is that the soil, these things [environmental issues, e.g., biodiversity, climate change, etc.] are an agent of the condition of the soil. To me, the government is taking their eye off the integrated value of considering the soil as the glue, is the glue to all of these issues” [Exp1].

The rationale behind the policy draft reflects a perception of the soil grounded in the epistemological precepts of modern soil science that exceeds the traditional focus on agriculture and agronomy – a productivist ontology – (Field et al., 2017) by, for example, looking after soils health and sustainability through the “balancing of competing land uses and their ecological footprints”, “using soils as carbon storehouse” and “supporting biodiversity” (DPI, 2011b). The proposal’s underpinning on contemporary soils thinking is also reflected in the incorporation of the principle of maintenance and improvement of ecosystem functions for effective soil management, fostering multidisciplinary knowledge exchanges between fields such as law, policy, social sciences, economics, engineering and physical sciences; and cross-collaboration between landholders, community, industry, government and researchers (DPI, 2011b). Furthermore, the document proposes developing soil research “in areas of emerging significance” (e.g., measurement of soil organic pools, sequestration of soil carbon, and a better understanding of soil biology). In addition, it explicitly addressed the connection of soils to other environmental problems, such as climate change, and biodiversity, providing further reasons to consider soils as a key natural resource in environmental governance. As it is stated in the document, “If soil is not adequately protected and managed, resulting soil degradation will ultimately undermine sustainability across the entire natural resources spectrum” (DPI, 2011b).

To fulfil the vision of soils as an all-encompassing natural resource, the policy proposal adopted, as some interviewees pointed out, an ambitious comprehensive approach that includes, besides the set of objectives and strategies shown in Figure 5.2, a detailed action plan (DPI, 2011a). As a participant commented, “it’s a complete plan; it goes to the next level pretty much” [Exp 2]. In this way, the proposal sought to elevate soils from the disfavoured position it had been put under the integrated NRM scheme. Though the working group sought the contribution of diverse stakeholders through consultation and participation in workshops, the attempt at grounding soils in the proposal is mainly based upon this contemporary soil scientific view. In this regard, a participant observed that the policy draft “was based on a well-constructed understanding from a community of scholars” [Exp6]. In this way, it could be argued that one of the expectations behind the proposal was to reinvigorate a discipline whose identity has been lately “put at stake” (Puig de la Bellacasa, 2015, p. 697) after decades of experiencing a sort of “pessimism” and “overall decline” (Hartemink & McBratney, 2008). However, such an approach could have worked against a policy that might have been regarded as restricting the actions of the new government. Moreover, considering that it was a policy formulated by scientists, it could have been seen as self-serving by politicians.

Overall, this soils framing has ontopolitical effects (Krzywoszynska & Marchesi, 2020) not only in terms of what soils realities are intended to be actualised in reality but also in the other two dimensions of the PoFF (i.e., justice and power) and the juxtaposition of all three dimensions together provides an explanation for shelving the policy.

5.3.3 Normative considerations

Though there is no explicit reference to issues of justice from an ecological perspective that acknowledges soils as political subjects, the policy makes constant references to sustainability, for example, when it claims that “[t]he policy is intended to guide a wide range of stakeholders towards sustainable use and management of soils” (DPI, 2011b). Hence, it could be inferred that concerns about

intergenerational equity and solidarity – central tenets of sustainability – are implied in the policy proposal framing. The anthropocentric perspective on soils that governs the policy model (following the precepts of contemporary soil science) emphasises the instrumental value of soils (consequentialist ethics) but not just for agricultural production since it integrates a broader view of ecosystem service delivery and human wellbeing, tacitly addressing issues of intergenerational justice. For instance, one of the seven principles for “effective soil management” included in the policy claims that “[s]ustainable soil management to improve ecosystem function and to enhance soil biology is also critical for underpinning the production benefits of soils in agriculture and forestry”. In this regard, an interviewee pointed out that one of the pillars on which this policy rested was recognising the necessity of government action to protect the soil for all sorts of productivity, not only agriculture. As he explained it,

“[i]t was generally accepted that the reason that we were doing the soils policy was to protect our soil, not only from the agricultural production issues of erosion and acidification and that sorts of things, but it was about natural resource productivity, and in some cases even our urban productivity, community protection as well” [Exp4].

Furthermore, the draft proposed a shared obligation over the protection of soil resources, allocating responsibilities and roles to the state through its diverse agencies, local governments, as well as community organisations, industry and landowners. With this proposal, the state assumes an active responsibility for the stewardship of NSW soil resources. As stated in the document’s subsection about implementation: “[r]esponsibility for the implementation of this policy rests in the first instance, with government agencies and authorities” (DPI, 2011b). However, this might have represented a potential conflict with the pervading neoliberal rationale in the public sector that had reallocated the responsibility for the protection of soil resources to the landowner whose private property rights are safeguarded. As has been argued by Hansjürgens et al. (2018), the property rights approach not only defines soil regimes, but it also has consequences for

sustainability issues depending on “to what extent ownership of land and soil can be regulated and its use limited”. In this regard, a participant claimed that under the neoliberal frame, soils are not necessarily a matter of concern to governments. As he expressed, “soils are basically considered to be owned by the landholder, and unless there are [negative] externalities, it doesn’t get much in the way for consideration” [Exp4]. Similarly, another participant claimed, “[...] everyone’s property is sort of their castle, they have their say as to exactly what they are going to do on their land and doesn’t take into account what should be produced to have food in the future and all that sort of thing” [Exp2]. Consequently, investing in a policy that was going to transfer responsibility for soil protection to the state again did not align with this logic and, at the same time, might have raised fears of potential backlash over property rights. On this matter, a former government official said,

“[...] is sort of saying there is no real reason why public funding should be spent on this because if private landowners want to wreck their own land, that is their problem. They [the government] don’t bail their businesses going bad” [Exp6].

As a result, today, private property rights and landowner responsibility continue to outweigh the role of the state in protecting and securing the sustainability of soil resources.

5.3.4 The shift of government and a covert political-ontological dissensus

The end of the political cycle that instigated the policy design process intervened in the chances of the policy passing through the tiers of the political agenda. Moreover, by the time the proposal was presented to the new authorities (i.e., the Liberal-National Coalition Party), there were no major environmental crises to create a sense of urgency and public concern as occurred with the 2009 Red Dawn dust storm, and the Millennium Drought (2001-2009) was by then over. When the effects of degradation are immediately visible, governments have shown to be

more prone to intervene, but the silent and gradual nature (Bouma & McBratney, 2013) of most degradation problems contributes to the lack of awareness. In this regard, an interviewee said,

“[...] when there were really visible impacts of land degradation, it was quite easy to rally support. But when it is about a critical structure decline, acidity, salinity, those sort of symptoms of land degradation really don't get much in the way of political support, or if they do, it's not for very long” [Exp5].

Two significant consequences follow from the ontopolitical position guiding the policy proposal. First, in yearning to re-politicise a long-marginalised natural resource and reinvigorate a somewhat ostracised scientific discipline in the policy context, the draft ended up being “too comprehensive”, according to most interviewees. The expanded list of strategies and actions could have been seen as “tying up” to commitments that were not in the self-interests of the new ruling party, as they might constrain future policy directions in unforeseen ways. The proposal was not only guided by up-to-date soil approaches, but it also emphasised the role of research and development and the production of evidence for assessing decision making. Some of the participants regarded this strong focus on science and evidence as intermediaries in the process of decision making as a factor that could have influenced the decision to reject the policy because it could limit politicians' capacity for action. As a former government soil official reflected,

“The reason I believe the original one didn't live up is that [politicians] they don't want to be tied to distinct policies, long-term policies that are based on science, they want to be tied to policies they can change through politics” [Exp4].

Second, the proposal sought to actualise a certain order of human-soils relationship in the social domain, that presumably was not aligned with that of the incoming government. Different philosophical positions about environmental concerns carry different responses (Coffey, 2019), and the new Coalition government was, according to some participants, “less interested in conservation”

and “very much more focused on development”, while the previous Labor government was a “little bit more aware of environmental issues”. Soils mean different things to different people and to different political projects. On this matter, one of the interviewees explained that the new political priorities were focused on development and production, which translated into providing more support to primary industries while downsizing the “environmental side” of government (as it was advocated on their policy platform leading up to the election). In his words,

“Another reason is that when the conservative government came into power, they wanted to redress what they thought was an imbalance between the power of the green lobby or the ‘greenies’ and the industry and farming being part of that industry; that is why they are called primary industries. All the partner names, they are all sort of industry-oriented, they are all about economic development [...] they even changed some of the legislation if they had an ‘e’ which in the past was environmental, in all the legislation they changed the ‘e’ term to economic, so quite specifically from environmental to economic” [Exp2].

The emphasis of discourses of the newly elected government, as stated by Premier Barry O’Farrell (2012), was put on “growing the NSW economy” while criticising the “failed green schemes” – thus, there seemed to be little willingness for environmental reform (Gonzalez Lago et al., 2019). Against a background of changing ideologies and interests emerges the divergence of visions over social-ecological orders. For example, some of the participants mentioned that the new government was more interested in soil values for agriculture and for planning infrastructure (expanding urbanisation). One of them said that the Coalition’s “primary planning issues are housing, transport, education, [...] planning for things like urban development, the extension of towns, and where to put them, but it has never really taken into account the soil resource or the value of that resource to the state” [Exp4]. Nevertheless, it should be noted that the protection of prime agricultural land has been part of the government’s policy since the release of the

Biophysical Strategic Agricultural Land (BSAL) protocol in 2013. On the other hand, the soil policy draft of 2011 proposes the necessity “for existing markets to better reflect soil degradation costs” and that the different uses of the land “must reflect the value of soils” (particularly emphasising the assessment of the suitability of land for housing). Furthermore, an interviewee explained the philosophy aligned with the soil policy proposal is “[...] more interested in aesthetics, in conservation, protection, more interested in sustainability, so is sustainable development, and varied things for a larger group of people for a longer period of time rather than for individuals now” [Exp2].

Differences in the meaningfulness and values attributed to soils reflect divergent political positions about the role of the state in intermediating human-soils relationships. Whereas the policy proposal aimed to elevate them to a prominent place in the regulatory landscape of NR since it is the primary element that binds and supports all terrestrial ecosystems, for the new conservative government, soils are fundamentally a private asset, a “privatised universe, sold as a resource” (Puig de la Bellacasa, 2014, p. 37). Thus, conservation measures should fall into landowners’ and communities’ hands. Furthermore, as will be explained in Chapter 7, for this government, introducing a policy change was unnecessary because “there was nothing to be fixed”.

5.4 Conclusions

In this chapter, I have explained how actors at the science-policy interface, drawing on their political stances towards what is real, use framings as strategies of de/politicisation to legitimise their interests and policy choices and contribute to shaping public perceptions about the (un)importance of the soil resource. The politics of framing takes a dynamic perspective aiming to unveil that the political ontologies about human-soils relationships are plural and contingent and constantly seek to be ingrained in the social through discursive practices of sense-making and preference shaping.

The first part of the chapter has traced the problematisation of soils in the NSW's public sector, identifying how and why it came to be a policy problem and capturing shifts in thinking and the associated institutional discourses and practices. I discussed the NSW soils' trajectory using a de/politicising perspective that sought to make the politics behind each transition visible. Soils were politicised in the 1930s as a reactive response of the state to acute erosion problems and to support the rural productive base. Although the more visible forms of erosion were effectively tackled, insidious forms of degradation still pose critical challenges to the state. During the 1990s, depoliticising strategies gradually displaced soils from the governmental sphere to the private sector. The emergence of integrated management frameworks based on discourses of efficiency and new environmental priorities legitimised this depoliticising condition under which the former SCS was disarticulated, and soils became progressively marginalised. By the end of the 2000s, a window of opportunity for developing a contemporary soils policy opened in the political system. After three years of cross-sector collaboration, in 2011, a draft was presented to the newly appointed government. This re-politicisation strategy, which aimed to bring back soils to the policy agenda with a comprehensive approach based on contemporary soil science, was finally dismissed.

The analysis of the NSW soils' trajectory, or indeed the "career" of soils in the New South Wales policy arena, reveals that problem setting is never complete or total but rather an open-ended and contingent process. From this point of view, we can think of problems in positive terms as the opening up of a field of possible solutions and responses that are constantly creating new effects, instead of negatively as obstacles that have to be overcome with true and accurate solutions as in rational models (Barry, 2020, p. 2). Furthermore, though there are elements of self-evident truth in regarding depoliticisation as something "bad" (Fawcett et al., 2017), it may also provide a background against which new ways of thinking about an issue can unfold and advance re-framings that include new perspectives, actors, values and judgements, strengthening a societal cause. Overall, as Anshelm and Haikola (2018, p. 567) argue, depoliticisation are active processes that "harbour

strong political potential”. In other words, they claim that what is left out by depoliticisation creates latent tensions that contain the potential for re-politicisation.

The second part of this chapter was dedicated to exploring in further detail the failed attempt at re-politicising soils by focusing on the political ontological dimension of my heuristic framework, the PoFF, and its effects on the dimensions of justice and power. To the experts who developed the proposal, human-soils relationships are affected by the several natural functions and processes performed by the soil, which also have consequences for broader environmental issues (e.g., climate change and biodiversity). The adoption of an enterprising approach that sought to move soils from a marginalised position in the institutional context was justified by their primary role in supporting all terrestrial ecosystems. Moreover, it would reinvigorate the soil epistemic community, which had also been affected by the process of soil depoliticisation. The proposal was fundamentally grounded in contemporary soil science approaches and provided scientific knowledge and evidence of the critical function of informing soil decision making.

Scientific arguments, Pellizoni (2014, p. 205) claims, “have critical leverage to the extent that they bring to the fore neglected issues”. However, he states that the risk of grounding issues in scientific terms is perpetuating their depoliticisation by portraying them as technically manageable and solvable. Despite the scientific underpinning, the ontological and ethical commitments embedded in the draft policy (e.g., render soils as an active area of policymaking, care for their sustainability, assuming the state’s responsibility in their protection, and fostering cross-collaboration amongst disciplines and stakeholders) suggest a genuine attempt at re-politicising soils, understood as the amplification of the scope of the realm of politics. Of course, to the perspective of depoliticisation as a societal condition that was explained in section 5.1, the policy draft is far from proposing a radical transformation of the established order. Yet, as Anshelm and Haikkola (2018, p. 565) argue, this “narrow” view on politicisation “risks analytical insensitivity to the political potential in acts that may not be explicitly framed as

being against capitalism” but which, nonetheless, emerge from the flaws of the existing order.

The three dimensions of the PoFF proved useful to capture areas of tension and conflict in revitalising the political in soils, commonly regarded as “dead matter”. To a large extent, the policy failure in NSW is explained by political ontological differences that found their clear expression in power (conservation vs commodification, aesthetics vs development) and justice dimensions (co-responsibility vs property rights). Though these dimensions are proposed as essential elements to analyse environmental framings critically, their boundaries are somewhat porous. Moreover, they might not always be accessible only by means of speech or reading documents. Therefore, we should be aware that the framework assembles only part of the story (Blaser, 2009) while the remaining part belongs to the *practices* through which “worlds are made” (Law, 2004; Mol, 1999, 2002). That being said, it should also be kept in mind that depending on the specific context and profile of the actors involved, access to their routines and practices could be problematic (e.g., policymakers, technobureaucrats).

Finally, it should be noted that lately, we are witnessing political discourses resurfacing soil issues, such as the (now former) Australian Prime Minister Scott Morrison’s recent Press Club speech⁶¹, framing them as fundamental in assisting climate change mitigation. Nevertheless, this framing – to be analysed in more detail in chapter 6 – emphasises a specific soil function (i.e., carbon sequestration) as a technological fix that excludes the complex web of functions and processes performed by soils. Moreover, this framing might be a mere strategic move to control the agenda on climate change via soils and not a principled (deontological) one for re-politicising soils.

⁶¹ Available at: <https://www.pm.gov.au/media/address-national-press-club-barton-act> [Accessed: 8 March 2021]

Chapter 6

Keeping soils captive: concealing their political condition

Human land-use practices have dramatically transformed the Earth's surface, a process that has been accelerating in the last 300 years due to the intensification of agriculture and forestry production (Ramankutty et al., 2006). Though such *practices* vary across scales and regions, the “ultimate outcome is the same: the acquisition of natural resources for immediate human needs, often at the expense of degrading environmental conditions” (Foley et al., 2005, p. 570). The process of (legal) enclosure of common lands that in England, for example, found its apogee in the seventeenth century (Wordie, 1983) progressively turned the soil into economic assets of the landowners. As Karl Polanyi argues in *The Great Transformation*, originally published in 1944, the enclosure movement in England was fundamental in the transition towards the market economy, disrupting the fabric of pre-industrial society by dispossessing the poor of “their share in the common” (Polanyi, 2001, p. 37). Consequently, privatised soils started performing an essential role in capital markets and capital accumulation by supporting the provision of (agricultural) commodities such as food, fibre and fuel (Engel-Di Mauro, 2014; Salazar et al., 2020).

The advancement of industrialised capitalist agriculture, intensified in the last sixty years (since the so-called Green Revolution), with the introduction of high-yielding crops, fertilizers and pesticides, amongst other techniques (Matson et al., 1997), has become one of the major drivers in land-use change (Rockström et al., 2009), currently pushing soils to transgress four out of the nine planetary boundaries into a high-risk zone (i.e., biosphere integrity, biogeochemical flows, land-system change and freshwater use) (Campbell et al., 2017). Against this backdrop, efforts to raise the profile and awareness of soils and the necessity for policy actions to protect this resource have mounted (Davies, 2017; Montanarella, 2015). Such efforts are supported by several recent reports about the effects of human activities on the bio-geo-chemical processes and functions performed by soils (FAO et al., 2020; FAO & ITPS, 2015; IPBES, 2018; IPCC, 2019). Since soil degradation processes appear to be amplified by intensive agriculture (Helming et al., 2018) and cropland expansion (Zabel et al., 2019), demands for the sustainable management of soils have increasingly stressed their “common good” nature – e.g., supporting, regulating and provisioning ecosystem services; food security; host to biodiversity; and well-being benefits (Amundson, 2020; Bartkowski et al., 2018; Creutzig, 2017; Stronge et al., 2020). In this regard, for instance, Gomiero (2016, p. 29) argues that “[e]ffective governmental policies should be implemented in order to facilitate the adoption of more sustainable management practices, for example, by implementing policies that favour the provisioning of ecosystem services”.

Nevertheless, despite this momentum towards improved soil management, soil governance regimes are still “deficient in terms of protecting soils and ensuring their sustainable management” (Bartkowski & Bartke, 2018, p. 1). Two critical tensions underlie the stagnant state of affairs in soil policy development, perpetuating soils as a second-tier priority (Montanarella et al., 2016; Vrebos et al., 2017): on the one hand, private ownership of a resource that is an essential public good has been largely recognised as a constraint for effective public policies aimed at soil protection in the agriculture sector (Bartkowski et al., 2018; FAO & ITPS, 2015; Hansjürgens et al., 2018; Salazar et al., 2020). Consequently, societal demands “are currently not properly represented in the property rights regime in the context

of agricultural land and soils” (Bartkowski et al., 2018, p. 7). On the other hand, the conflicting interests between productivist and environmentalist objectives (Krzywoszynska, 2020) translate into unbalanced policy approaches that favour the former over the latter (Gomiero, 2016). Policies and instruments oriented to secure profits and to reach yield goals are privileged, while conservation measures are “often the first to be sacrificed” (DeLong et al., 2015, p. 867). Furthermore, some of the degradation issues, such as soil nutrient decline, are treated with “weak” sustainability practices, i.e., technological fixes such as the application of inorganic fertilisers to address soil nutrient depletion (Brand, 2009).

In light of these existing tensions, in this chapter, I delve into the power dimension of the Politics of Framing Framework (PoFF) introduced in Chapter 4.1 to explore how power is currently shaping the governance landscape of soil resources. In doing so, I will analyse soil framings of relevant actors at the science-policy interface (public officials, policy entrepreneurs and soil scientists) in the state of New South Wales (NSW), Australia. This chapter addresses the following research question: How is the problem of soil degradation currently being framed in New South Wales’ policy arena? Supported by three subsidiary questions: What is the current dominant soil framing, and which ideologies underpin it? To which interests does it conform? Who holds and circulates relevant information about the status of soil resources within government and outside of it?

This chapter is structured in four parts. The first section is dedicated to an in-depth exploration of the power dimension of the PoFF by addressing two principal approaches in power studies: power as domination and power as transformative capacity. Then, I describe the present context of soil governance in the state of NSW. In the third section, I analyse the empirical results by examining how the “3Is” entailed in this dimension of the PoFF (i.e., ideology, interests and information) are strategically mobilised in experts, public officials and policy entrepreneurs’ framings of soils. I conclude with a synthesis of the findings and a reflection on the role of environmental policies in ensuring soils sustainability.

6.1 Two interrelated views on power

Power is a theoretically complex concept, contested within and across disciplines - or rather; it is a “family resemblance concept” in Wittgenstein’s parlance (Lukes, 2005) or a cluster of concepts (Clegg & Haugaard, 2009b). Therefore, instead of attempting to provide a comprehensive definition, I will explain what power means within the specific context (Avelino & Rotmans, 2011) of the PoFF. In previous work, I claimed that not all public problems become policy problems or “are politicised through the process of policymaking” (Gonzalez Lago et al., 2019, p. 219). A problem is politicised when it becomes part of a policy domain by thriving in two distinctive and interrelated processes: problem definition and agenda setting. Problem definition focuses on how different actors identify, conceptualise and interpret a problem (Dery, 1984; Rochefort & Cobb, 1993; Stone, 1988; Veselý, 2007); in other words, from a constructivist perspective, it is concerned with the stories that we tell and how they influence the (re)politicisation, neutralisation or depoliticisation of issues. Agenda setting is, according to Wolfe and colleagues (2013, p. 179), “fundamentally about the politics of attention and attention dynamics at the level of the political system”. More specifically, it is a process of filtering issues through which problems and their potential solutions (strategies and instruments) “gain or lose public and elite attention” (Birkland, 2007, p. 63). The PoFF seeks to understand the connection between these two processes by revealing the connection to “the political” in public problems, that is, their inherently contingent, contested, and conflicted nature based on the different “views and desires that cut through the social body” (Swyngedouw, 2015, para. 1). The political, as Kenis and Lievens (2014, p. 537) argue, “is each time of a symbolic nature and entails a discourse that recognises and makes visible the reality of conflict, power, and the contingency of society”.

Departing from this perspective, the approach to power adopted in this framework articulates the two typically antagonistic traditions in power literature (Haugaard, 2012; Karlberg, 2005), namely the studies of *power as domination* (conflictual or adversarial theories) usually expressed as “power over”; and the

studies of *power as capacity* (consensual or empowerment approaches), commonly translated as “power to” and “power with”. For practical reasons, I will discuss both perspectives separately, as each representation of power is better suited to the analysis of the distinctive phenomena with which this framework is confronted, i.e., depoliticisation (power as domination) and re/politicisation (power as transformative capacity). Nevertheless, such approaches can be assembled if, for example, as Hauggard (2012, p. 34) argues, we consider that empirical processes of material and ideational reproduction based on structure-agent mutual implications (“structuration practices” in Giddens’ terminology) contain the “normative potential both toward domination and emancipation”. Fundamental to this perspective is the recognition that said processes are inherently contingent in such a way that structuration is “frequently met by destructuration” (Clegg, 2010, p. 5; Clegg & Haugaard, 2009a, p. 411).

Thus, “power over” and “power to” can both be regarded as being part of the same (contingent) process in which power is at once repressive and productive (Göhler, 2009). This is certainly the Foucauldian view on power as a ubiquitous force engrained in all social relations and exercised in various forms, not just as repressive, but most importantly, as a productive force of things, pleasure, knowledge, and discourse that renders it acceptable without resorting to coercion (Foucault, 1980). Such effectivity of power lies in its intrinsic relation to knowledge and the creation of regimes of truth with their concomitant “technologies of power” (institutions, norms, narratives, beliefs, and so on) that pervade subjectivity and secure compliance. Therefore, although to Foucault, power is not necessarily negative – as it produces the social fabric, it always assumes a form of domination, and for that reason, it is “normatively reprehensible” (Clegg & Haugaard, 2009a, p. 406). As Foucault famously claimed, “[w]here there is power, there is resistance, and yet, or rather consequently, this resistance is never in a position of exteriority in relation to power” (Foucault, 1978, p. 95).

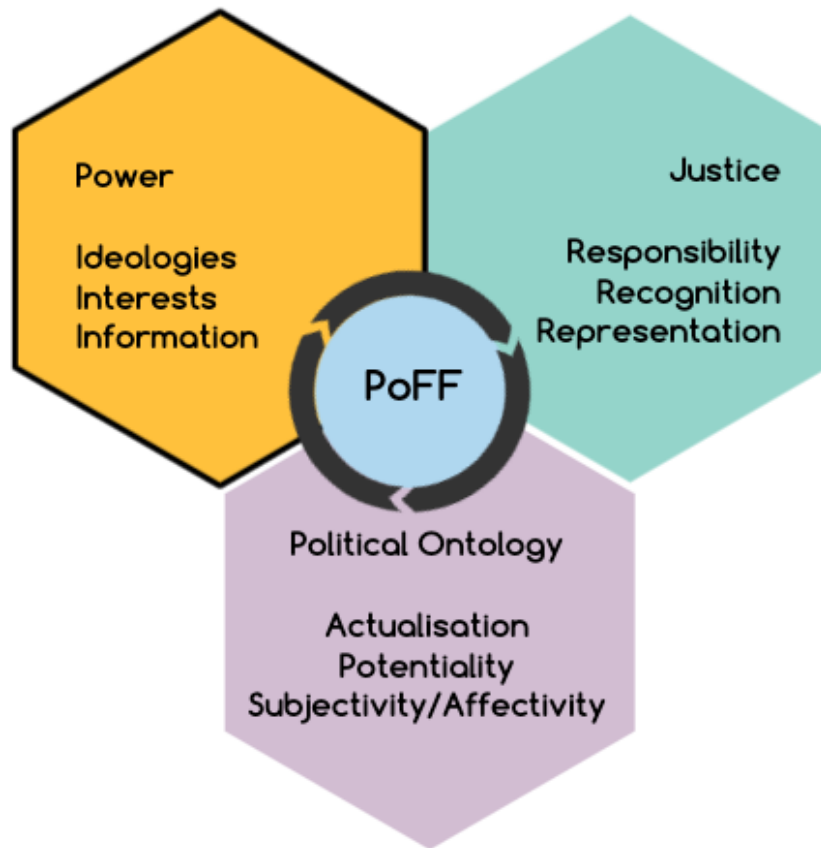


Figure 6. 1 This chapter explores the Power dimension of the Politics of Framing Framework. See Chapter 4 for a detailed introduction of the PoFF.

The literature on power as domination revolves around issues of conflict, control, and coercion (Karlberg, 2005). Thus, it provides the appropriate language to explain the processes of environmental issue neutralisation and depoliticisation in the policy arena. A significant contribution to the studies of power as domination has been Lukes' (2005) "three-dimensional" theory of power, which builds on the work of Dahl (1957) and Bachrach and Baratz (1962). Dahl's definition of power (the first dimension) states that "A has power over B to the extent that he can get B to do something that B would not otherwise do" (1957, pp. 202–203). In his perspective, power is exercised in causal social relations, and therefore, the analysis of power focuses on the behaviour of actors "in the making of decisions on issues over which there is an observable conflict of (subjective) interests, seen as

express policy preferences, revealed by political participation” (Lukes, 2005, p. 19). In their seminal work “Two Faces of Power”, Bachrach and Baratz (1962) criticised Dahl’s influential definition of power due to its engagement in overt conflicts about key topics, concealing more subtle forms of exercising power by, for example, “confining the scope of decision making to relatively ‘safe’ issues” (1962, p. 948). Moreover, it assumes that all members participate in decision-making processes, and individuals’ non-participation express their agreement with decision making (Gordon, 2009). Consequently, they added another layer to the analysis:

“Of course, power is exercised when A participates in the making of decisions that affect B. But power is also exercised when A devotes his energies to creating or reinforcing social and political values and institutional practices that limit the scope of the political process to public consideration of only those issues which are comparatively innocuous to A. To the extent that A succeeds in doing this, B is prevented, for all practical purposes, from bringing to the fore any issues that might in their resolution be seriously detrimental to A’s set of preferences” (Bachrach & Baratz, 1962, p. 948).

The second dimension of power refers to the control of the political agenda by excluding or delaying decisions on contentious issues (Torfing, 2009); rather than a “coercive power” as in Dahl’s vision, it is a “blocking power” (Birkland, 2007, p. 66). Preventing potential issues from entering the policy arena is, in terms of Bachrach and Baratz (1962), a non-decision making process, which is, indeed, a type of decision making (Haugaard, 2009; Lukes, 2005). In fact, one of the most effective ways in which power operates is by maintaining specific issues outside of the policy agenda without necessarily experiencing overt conflict (Clegg & Haugaard, 2009b). As Majone (2006, p. 232) asserts, “the power to keep something off the governmental agenda is as important as the power to choose among the few policy options that make the agenda”. This power over the agenda does not reside merely in asymmetrical relationships of power amongst actors but also in what Schattschneider (1960, p. 71) defined as the “mobilization of bias” of political

institutions, through which “some issues are organized into politics while others are organized out”. Bachrach and Baratz (1962, p. 950) assert that certain issues become more important than others because “[o]f the dominant values and the political myths, rituals, and institutions which tend to favour the vested interests of one or more groups, relative to other”. Otherwise stated, certain issues have better chances to enter the agenda because “the bias of the political system allows them to be raised, while others are, according to the bias of the system, unfit for political consideration” (Birkland, 2007, p. 67).

In Lukes’ (2005, p. 27) view, none of these two accounts captures the whole spectrum in which power operates, as both presuppose conscious non/decision making and the presence of overt or covert conflict, and yet, as he argues, “this is to ignore the crucial point that the most effective and insidious use of power is to prevent such conflict from arising in the first place”. Thus, the third dimension refers to the mechanisms that shape individuals’ preferences “in such a way that they accept their role in the existing order of things, either because they can see or imagine no alternative to it, or because they see it as natural and unchangeable, or because they value it as divinely ordained and beneficial” (Lukes, 2005, p. 28). To Gaventa (2006), this form of power operates through the internalisation of the ideologies, values and norms of conduct of the powerful by the powerless. Though conflict is inhibited in this dimension, the “potential” for conflict remains. In other words, latent conflicts might exist as a result of “the contradiction between the interests of those exercising power and the real interests of those they exclude” (Lukes, 2005, p. 28). Though the notion of “real interests” has been widely criticised for its normative assumptions and difficulties in terms of empirical observation (Barbalet, 1987; Benton, 1981; Clegg, 1989), Lukes’ contribution is critical to understanding that power can be exercised without overt or covert conflict but rather through elusive forms of “management of meaning” (Haugaard, 2009) through which compliance is achieved.

Other authors have offered different nomenclature to the three dimensions of power. For example, VeneKlasen & Miller (2007) refer to *visible power* – observable decision making guided by norms, rules, procedures, etc.; *hidden power* – control

over decision making and agenda setting; and *invisible power* – shapes meaning which implies not only the exclusion of topics from the agenda but also from people’s consciousness. Fuchs and Lederer (2007) categorise the three dimensions as *instrumental power*, which focuses on the influence of an actor on political decision making (policy outputs); *structuralist power*, which analyses the material structures and processes that place certain actors in advantageous positions over others to rule-in/out policy alternatives (policy inputs); and *discursive power* which forefronts the role of discourse as the locus of political disputes influencing “the frames of policy problems and solutions, of actors in the political process, and of politics and the political as such” (Fuchs & Lederer, 2007, p. 8).

Returning to our framework, power falls into the domination perspective when the analysis is confronted with the depoliticisation of public problems in one or more of the following ways: decision making that removes issues from the governmental agenda (*instrumental power*), control of the process of agenda setting by influential groups (*structural power*) and control of the narrative(s) surrounding the problem (*discursive power*). Through instrumental power, governments can demote issues to other non-governmental spheres (private or the realm of fate). The exercise of structural power restrains specific issues from the policy agenda and reinforces the political values, ideas and practices of those influential policy actors or groups of actors. Discursive power operates by normalising the state of affairs and precluding the elevation of alternative problem constructions and solutions and, thus, excluding the consideration of other policy options. Conflict, in whatever form it arises, is the result of the emergence of unorthodox problem framings that challenge the status quo and seek to gain attention.

Nevertheless, power is not always exercised as a form of domination; it can also be transformative (Giddens, 1984). Whereas “power over” has, in general (though not always), a negative normative connotation since it limits agency, “power to” and “power with” are positively perceived as they denote the capacity for action and autonomy (Clegg & Haugaard, 2009a; Göhler, 2009). Moreover, “power to” can be considered as a precondition (Dowding, 2008) to the exercise of power over

others. The study of power as capacity has been of particular interest to disciplines dealing with issues of emancipation, equality, and justice, such as feminist theory and research (Allen, 1998, 2018), peace research (Boulding, 1990; Karlberg, 2005), and also sustainability research (Avelino & Rotmans, 2011; Partzsch, 2017). From an environmental politics perspective, “power to” and “power with” are indispensable for understanding change and catalysing sustainable transformations (Partzsch, 2017).

A widely accepted interpretation of “power to” is the one offered by Pitkin (1972, p. 277) as the capacity of an actor or group of actors to accomplish something by themselves. Though actors may act together, she argues that this power is not instituted in social relations. “Power to” denotes the individual capacity to act autonomously (Göhler, 2009). Under this lens, power is related to cause and, therefore, to agency (Dowding, 2008), where agency is understood as implementing will (or agentic power) rather than possessing will (power of agency) (Campbell, 2009). Feminist scholars such as Amy Allen (1998, p. 35) relate this type of power to “empowerment” – the ability of an individual to act despite being in a situation of subordination; and “resistance” – the ability of an individual to achieve outcomes that contribute to overturning domination. In the field of sustainability research, this approach to power has been used in “understanding the possibility of alternative ideas and values” (Partzsch, 2017, p. 197). According to Partzsch (2017), studies exploring how “power to” relates to policy change have focused on the role of self-determinate agency, particularly at the outset of transformation processes. Moreover, as she argues, actors advocating for sustainable transformations (for example, “policy entrepreneurs”) are motivated to act based on their individual normative assumptions and environmental values.

When individuals with shared worldviews converge in their motivations to act, then “power to” becomes “power with”. This power refers to the “processes of finding common ground among diverse interests, developing shared values, and creating collective strength by organizing with each other” (Partzsch & Fuchs, 2012, p. 360). One of the most prominent exponents of “power with” is Hannah Arendt, who defined power not as an individual but as a collaborative capacity, “it

corresponds to the human ability not just to act but to act in concert” (1970, p. 44). In her view, power is the opposite of violence; it is a “civic virtue” (Clegg & Haugaard, 2009a), a social relation based on communication and collaboration. To Allen (1998, p. 36), “power with” equates to solidarity when the individuals “act together for the shared or common purpose of overturning a system of domination”. In terms of environmental politics, research frames this power as “serving the common good (i.e., environmental protection, planetary stewardship)” (Partzsch, 2017, p. 196). Therefore, as Partzsch (2017) observes, researchers working on forms of “power with” do not render structural constraints as deterring action, but instead, they can be overturned by collective action (or coercion).

Therefore, “power to” and “power with” are valuable analytical tools, particularly for environmental research interested in promoting processes of societal transformation or policy change. When applying the PoFF, power should be examined as transformative capacity if we are dealing with processes of issue re/politicisation. According to Hay, “issues are politicized when they become the subject of deliberation, decision making and human agency where previously they were not” (2007, p. 197). Whilst depoliticisation implies “removing something” (e.g., responsibility, recognition, representation), politicisation involves “adding or supplementing” (Jenkins, 2011) what was once removed or was never recognised in the first place. Power is transformative when it empowers alternative narratives that disrupt the status quo (*discursive power*), favouring a rearrangement of the agenda by raising marginalised issues’ visibility (*structural power*) and effectively including new issues into the policy domain (*instrumental power*). It should be noted that I am not suggesting that everything should be politicised since, as scholars of agenda setting have largely proved, it is limited by time and resources. Furthermore, if everything can be politicised in the post-political condition, as Swyngedouw argues, it is “only in a non-committal way and as a non-conflict” (2011, p. 138). Instead, I argue that issues that have unequal societal and ecological impacts that put at risk the future well-being of humans and non-humans should be uplifted from their habitual ostracised positions.

To examine the power dimension, I will explore how different actors' ideologies, interests, and information shape the governance landscape of soil resources. I borrowed these categories from Carol Weiss's (1983) "three I's forces" model. This model assumes that each policy position taken regarding a specific issue is the result of the interplay between the three. In her model, *ideology* comprises ethical and moral values; more specifically, it is understood as the set of "philosophy, principles, values, and political orientation" (1983, p. 224). Furthermore, ideologies serve to create stability and guide action (Chen, 2016) in a policy domain. *Interests* are, in the context of this dissertation, the material expression of ideologies that determine who/what benefits and who loses as a result of a particular order of things. Finally, the availability and flows of *information* expose policy subsystems' biases insofar as they tend to select specific pieces of information that serve as explanatory frameworks for decision making while overlooking others (Jones & Baumgartner, 2005; Weiss, 1983). Based on the ideologies, interests and information-processing, certain problems are made salient, and others are omitted in the struggle to influence which issues should become subject to policymaking. This implies moving between two levels of analysis, *politics* which, in Jessop's words, refers to "which issues get thematised as legitimate topics of state action and political mobilisation" and *policy* that "denotes specific modes and fields of state intervention and non-intervention, the aims and content of particular decisions and non-decisions, and so on" (2014, p. 209). Thus, attending to the process of decision making (and non-decision making) is linked to the policy choice that shapes preferences by favouring certain interests (e.g., capital accumulation) instead of others (e.g., conservation).

6.2 New South Wales: present context

In the previous chapter, the trajectory of soils as a policy problem in NSW was analysed, and the PoFF was applied to explore the attempt at soils re-politicisation with the proposal of a new soils policy in 2011. The data analysis suggested that tensions between the political ontologies about human-soils relationships held by

the incoming government and those depicted in the proposal resulted in the dismissal of the draft. More specifically, the argument explaining the failure to re-politicise soils proceeds as follows: the opening of a policy window in 2009 that put soils back on the agenda led to the development of an ambitious policy proposal by soil experts working in the government. The extensive set of directives and guidelines was grounded on a conception of soils as an all-encompassing natural resource, binding all terrestrial ecosystems and the cornerstone of many environmental issues (e.g., climate change, biodiversity). Based on the critical relevance of soils for humans and the environment, the policy draft intended to reinstate responsibilities for its protection on the state and diverse stakeholders. However, this view did not correspond with that of the new administration strongly aligned with neoliberalism and the market economy, which emphasised soil productivist value and commodification.

The policy proposal “*NSW Soils Policy Looking Forward, Acting Now*” has practically gone unnoticed in the policy arena and academia. In a recent analysis of the state’s soil governance (Webb et al., 2015), it fails to get a mention. Although most of the interviewees that participated in the design of this draft acknowledged that it is outdated and would need a profound review, no intention of doing so seems likely to appear soon. Consequently, soil governance in New South Wales remains fragmented “across a range of agencies, strategies and legislative instruments” (Webb et al., 2015).

Little progress has been made in the past decade, and there is still no “unifying up-to-date soils policy” (Webb et al., 2015, p. 4). The most important instrument introduced during this period is the Biophysical Strategic Agricultural Land (BSAL) protocol in 2013, which seeks to protect prime agricultural land from the impacts of mining and coal seam gas activities (Imhof et al., 2018). As specified by this planning instrument, valuable agricultural lands are those that “have the best quality landforms, soil and water resources which are naturally capable of sustaining high levels of productivity and require minimal management practices to maintain this high quality” (NSW Government, 2013, p. 2). Another recent instrument is the “Biodiversity Conservation Investment Strategy 2018” (OEH,

2018), which despite the advocacy efforts of some soil scientists interviewed in this research, fails to integrate soils. In this regard, a soil scientist stated that “we have put in submissions about putting more soil into that document because of the value of soil biodiversity, and they weren’t considered” [Exp4]. Another one claimed that “if you look through that investment strategy, soil biodiversity and soil values to the general ecology and biodiversity protection are not very well addressed at all” [Exp6]. Overall, the strategy focuses on protecting habitats and endangered species (e.g., animals and vegetation) above ground⁶² while overlooking the life beneath it.

As analysed in the previous chapter, during the period of soil politicisation, several critical soil problems affecting the state (e.g., erosion and salinity) have improved with the introduction of sustainable management practices such as minimum tillage approaches, crop modelling and weather predictions, and weed control, amongst others (Cork et al., 2012; DAFF, 2014). Moreover, the development of a variety of policies and instruments addressing specific functions and processes of soils have also contributed to enhancing the condition of state-wide soils (e.g., *Contaminated Land Management Act 1997*, *Sustainable Agriculture Policy 1998*, *Native Vegetation Act 2003*) (Webb et al., 2015). As a result, most interviewees concur that today’s soils issues are “less visible” than in the past. For example, one of them mentioned that “the erosion problem is nowhere near as obvious as it was, let’s say, even 30 or 40 years ago” [Exp2]. Despite these advances, there are still several soil problems affecting the state. According to the experts, policy entrepreneurs and government officials interviewed currently, the most pressing ones are: soil acidity and the complex issues related to it, the effects of extreme weather events (e.g., droughts), water holding capacity caused by the loss of structure due to organic matter decline, deficiency of key nutrients, land-use conflicts (e.g., loss of prime agricultural land to urbanisation), contamination, and

⁶² More concretely, the strategy determines that investment in private land conservation “should protect good examples of the least protected ecosystems” such as threatened species or endangered populations; over-cleared vegetation types; wetlands; old-growth forests; rainforests; koala habitats; biodiversity corridors and climate refugia (OEH, 2018, pp. 17–18).

the lack of appropriate frameworks to assess and manage land and to evaluate ecosystem services. Furthermore, as has been widely reported, degradation processes in NSW are at risk of becoming more critical under the pressures of climate change and intensive land use (Baldock et al., 2012; Chapman et al., 2011; EPA, 2015, 2018).

6.3 Exploring the role of power in current soils framings

In this chapter, I analyse nine in-depth semi-structured interviews conducted with policymakers working in the soil sector (3), soil experts (4), and soil policy entrepreneurs (2) to investigate differences in problem framings between the scientific community and the public sector from a public policy perspective. The aim was to identify their political positions regarding the relevance of soils policy development by exploring how their ideologies, interests, and information flows and processing are embedded in the way they frame the issue. Following a purposive sampling, the selection of participants was based on their experience and knowledge (Etikan, 2016) in policymaking related to soils. Considering that the state's soil policy community is relatively small, finding candidates willing to participate was a major constraint. However, balanced participation across the three groups was reached, and the different perspectives pertinent to answering the research questions were captured (Bryman, 2012). News media articles, policy documents and reports produced by the NSW and the Australian governments were reviewed and integrated into the analysis (e.g., the Biodiversity Conservation Investment Strategy 2018, the National Soil Research, Development and Extension Strategy, and the Plan to Deliver Net Zero – *The Australian Way*).

6.3.1 Strategic framings and agenda control: from an unbreakable resource to an eco-technological fix for climate change mitigation

Although the concept of ideology is generally labelled as controversial, in the context of this dissertation, it is used to understand how political actors justify “specific agendas and policies of the current ruler” (Chen, 2016, p. 25) that shape

policy arenas. From a social science perspective, ideology can be interpreted in simple and broad terms as the shared belief systems, that are “relevant for social action, integration, and social stability, though it is not necessarily true” (Henning, 2007, p. 2230). Therefore, a fundamental function of ideology in contemporary societies characterised by accelerating change and increasing uncertainty is that they create stability and guide action by providing explanations to social situations that, if not, would be incomprehensible (Chen, 2016).

Unlike other natural resources or environmental challenges (e.g., water, biodiversity, food security, climate change) where a sense of urgency has permeated the public opinion pressing the political class to take some sort of action, as repeatedly emphasised in this work, soil-related problems are less visible to the public, hindering soil policy development. However, amongst the motives for enacting soils policy in NSW reported by interviewees, four themes emerged: the public benefits provided by soil ecosystem services, the necessity to change behaviour and incentivise farmers to adopt sustainable practices (especially when they deliver little or marginal financial return but are beneficial for society), encourage climate change mitigation via soil, and the necessity to create awareness and ensure intergenerational equity and solidarity by securing the availability of healthy soils for the future. Nevertheless, some interviewees argued that soils are not a priority in the state’s political agenda. Moreover, Exp9 commented that in the current context, “soil problems are not properly addressed in policy”. Overall, scientists’ and policy entrepreneurs’ accounts of the status of soil governance in NSW are fairly judgemental. A participant qualified it as “a disorganised mess” [PE1]. A former soil government official said it is a “patchwork spread amongst different departments and different responsibilities from one place to another” [Exp10]. More radically, a renowned soil scientist assessed that “New South Wales has the worst governance on soil of all the [Australian] states” [Exp8].

In a completely different tone, senior bureaucrats appear to be far less critical of the existing governance arrangements. In their view, there is insufficient reason for a policy change because there are no substantial problems in the state or at least not severe enough to justify it. As one of them said, “I don’t think there is any

taste for soils policy because I think the perception is that nothing is broken that would require a policy fix rather than just co-ordinated collaboration” [PO₂]. Moreover, the intuitive imagery of soils always being available, supports this reasoning. In this regard, one participant expressed,

“Soil scientists talk about the critical problems with soils and the risks associated with not having good soil management and policies in place, but at the same time, when I look through the window, the soils are still there, and the crops are still growing. So, all these very scary stories we have been hearing about our topsoil is disappearing, and that in 10, 20, 30 years will be out of soils, well, there is soil left, there always will be soil left there” [PO₃].

However, the idea that soils are physically inexhaustible obscures soil health-related issues and their interconnection to other environmental problems. Furthermore, it might reinforce public perceptions of their political irrelevance since they will never vanish – although their “invisible” functions and processes can become increasingly impaired. As a participant observed, this kind of thinking makes it difficult to “get people interested in soils at all” [Exp₁₁]. Moreover, as the interviewee pointed out, people “cannot connect soils to ecosystems, to the hydrology and vegetation in the area, to air [...] it is tough to get people to think like that”. Consequently, the lack of public awareness underpins the possibility of continued political inaction. Along these lines, when reflecting on the attempt at introducing a new soils policy in 2011, one of the senior officials argued that “there wasn’t anything significantly broken, so there was no need to proceed with a soils policy” [PO₂]. Nevertheless, considering experts’ and policy entrepreneurs’ discourses, there are sharp discrepancies in the value judgments of the tolerable “threshold of breakability”. However, it begs the question, does a vital resource need to be actually “broken” to result in action?

Furthermore, another senior bureaucrat was also somewhat sceptical about the role of policy and what could be achieved with it:

“If soils aren’t being managed the way we want them to be managed, why is that the case? How might we go about solving that? It probably depends. It depends on your worldview about whether policies are the right way to do that or not [...]. So, you sort of ask, will a policy solve those things? It might, but it doesn’t necessarily solve them. All I’m saying is that policies are just one of your instruments to get change [...]. Maybe I view this too pragmatically, in the sense that I know how hard it is to get a policy on the government policy agenda. If you are the New South Wales state government right now, at a broad level, you will go, ‘we don’t have a soil crisis right now’. Depending on your worldview, you might say we do. But from a politician’s perspective, that is not the thing that we have constituents knocking our door down on; there is a war over water, there are droughts, there is a whole bunch of other things. Maybe sometimes I get coloured by that pragmatic view of the world and wonder, what’s the likelihood of achieving change with policy? Okay, probably pretty low because the chances of getting a policy up are pretty low. So, in my mind, we focus our efforts elsewhere” [PO1].

There are at least three relevant topics of discussion in this statement. First, there is an implicit assumption that policy only manifests as direct intervention. As contended earlier, in the second dimension of power as domination, non-decision making is a powerful decision-making mechanism in agenda setting. By the same token, not having a policy is, in fact, a policy that is executed by means of depoliticisation through, for example, the reductions in funding for soil research, deteriorating the knowledge base, privileging information that reinforces the status quo (e.g., productivity over conservation), and transferring responsibilities to landowners and the private sector (explored in Chapter 5). Second, if the political capacity of policy to bring about changes (rather than instrumental-rational solutions) is continuously questioned, it might contribute to creating vicious cycles “that limit policymakers’ ability to act” (Nyborg et al., 2016, p. 43). In addition, it can also reinforce the growing sentiment of apathy in

neoliberal societies that produce depoliticising effects (Blühdorn, 2007) and delegitimises politics and policy. Third, it is also implied that policy is a direct intervention oriented to effectively solve or fix a problem. Indeed, not all societal and environmental issues can be “solved” through policies, as the above argument claims, particularly if they fall into the categories of wicked (Rittel & Weber, 1973) or super wicked (Levin et al., 2012) problems. Of course, public resources are not abundant and should be allocated responsibly to avoid wasting money (Pannell & Vanclay, 2011); and yet, imposing the problem-solving rationality neglects the insidiousness of soils problems – furthermore, as it was explained in the previous chapter, they have been effectively isolated from systemic natural resource issues in which they are integral. Turnbull (2006, p. 5) explains three limitations to the rationale of problem solving in policymaking which are pertinent to overcome when framing soils: first, it presumes absolute definitions of problems concealing contested views upon them, thus to this logic, we need to “only inquire as to what is the best solution”; second, it privileges problem solving over problem setting (which is equally or even more important); and third it assumes the policy process as scientific, disguising “the contingent nature of political reasoning”. Therefore, by appealing to the problem-solving logic, soils and the complex web of functions and processes can be easily left out of the agenda.

It is important to note that recent political discourses on the potential of soils to combat climate change are raising public attention to this matter in the Australian policy context. Following the launch of the “4 per mille” by the French Government at the COP21 in 2015, and scientific outputs that affirm there is scope for increasing soils capacity to sequester carbon from the atmosphere (Minasny et al., 2017; Zomer et al., 2017), this soil function is presented as a promising solution in climate change mitigation efforts. In a speech given by the Australian Prime Minister Scott Morrison to the Press Club⁶³ on the 1 of February 2021, he mentioned, amongst the government priorities for 2021-22, supporting the

⁶³ Available at: <https://www.pm.gov.au/media/address-national-press-club-barton-act> [Accessed: 8 March 2021].

National Soil Research, Development and Extension Strategy⁶⁴. As the Prime Minister stated,

“Australia’s soils are estimated to store some 3.5 per cent of the total global stocks of soil organic carbon against our 5.2 per cent of global land area. Native vegetation clearance and poor soil management have, and continue to result in, the loss of soil organic carbon”.

The goal, as expressed in the speech, is to invest in soil research as part of a strategy “to carry on the work on emissions reduction and climate resilience”. Arguably, the recent emphasis by the Morrison administration on soils as a “carbon capture technology” appears to be part of a strategy to appease controversy and gain control of the Australian climate agenda, which has been under growing international and domestic pressure to adopt a clear net-zero emissions target by 2050. It may also be shoring up National party support from farmers for the coming federal election in May 2022 through transfer payments. The government has been reluctant to pledge to decarbonisation despite its international commitments and the urgent warning of the IPCC (2021) sixth assessment report for rapid and strong actions to limit human-induced global warming and reach “at least net-zero CO₂ emissions, along with strong reductions in other greenhouse gas emissions”. Although the Australian Government announced a plan to achieve net-zero emissions by 2050 at COP 26 in Glasgow in October 2021, the document has been criticised for being a “statement of aspiration” that is “heavy on politics and light on analysis” (Jotzo, 2021). The plan does not introduce any new legislation, relying on voluntary actions, existing low emissions technologies – e.g., clean hydrogen, ultra-low cost solar, energy storage, low emissions steel and aluminium, carbon

⁶⁴ The National Soil Research, Development and Extension Strategy – “Securing Australia’s soil for profitable industries and healthy landscapes” (Soil RD&E Strategy) – released in May 2021 aims to provide more efficient information to users and help them build resilience. The Australian soil information system has been characterised as institutionally complex, with disparities in the technical methods used and limited economies of scale (McKenzie, 2018, p. 151). Against this background, the strategy focuses on ensuring that “soil research and development becomes more targeted and collaborative, and that research will better meet the needs of farmers. There will also be better information and tools available on soil use and management” (Soil RD&E Strategy, n.d.). Available at: <https://soilstrategy.net.au/strategy/soil-rde-strategy/> [Accessed: 31 March 2021].

capture and storage, and soil carbon – and future technological breakthroughs to achieve the target (Australian Government, 2021). In this scenario, soils are pivotal to the government’s “own” – *“The Australian Way”* – climate strategy based on a technology-first approach (Christoff, 2021) that seeks to “expand choices, not mandates” and “preserve existing industries” – including coal and gas production (Australian Government, 2021).

However, the capacity of soils to sequester and store carbon suggested in the plan has been questioned by several experts, claiming that it far exceeds “what publicly available peer-reviewed science suggested was possible” (Morton & Hannam, 2021). White and Davidson (2020) had previously argued that Australia’s strategy to consider soil carbon sequestration as a “technology” for reducing emissions is misguided. To the authors, the federal carbon offsets policy – the Carbon Farming Initiative – that pays landholders carbon credits if they increase the amount of carbon stored in the soil uses taxpayers’ money to subsidise private benefits (by increasing soil fertility and potentially its productivity). Although this choice of instrument⁶⁵ might indicate that the government believes that such private benefits of soils will drive their conservation, White and Davidson (2020, p. 5) claim that “it is highly questionable whether the public benefit (in the form of reduced emissions) is worth the cost” because the government has not yet done this analysis.

Scientists have been warning against the over-optimistic view of soil carbon sequestration because even if soils can create some environmental wins in the joint efforts to combat climate change, they will hardly remediate the problem⁶⁶ (Amundson & Biardeau, 2019; Baveye et al., 2018; Ranganathan et al., 2020). Reflecting upon this issue, for example, an interviewee said,

⁶⁵ In their view, the initiative has failed because it is profitless for farmers due to the complex regulations, the high costs of soil sampling and analysis and the low value of carbon credits (White & Davidson, 2020).

⁶⁶ An examination of the biochemical (e.g., finite capacity to store carbon and its instability in soils) and socio-economic (e.g., taking crops out of production at the paddock level and thus expanding production elsewhere, creating further land changes) limitations of soil carbon sequestration in climate change mitigation is beyond the scope of this analysis. For more detailed explanations, see, for example, Powlson et al. (2011); Searchinger and Ranganathan (2020).

“I think the potential of carbon sequestration is often oversold and overemphasised. Obviously, if they don’t have all the scientific knowledge, they believe that soil carbon sequestration will pay an easy answer, an easy fix to address issues of carbon emissions and other sectors of the economy. The potential is more than zero, but it’s not as great as some people are saying [...] I think it is worth talking about, though I think some people take a very simple approach, and they don’t understand the slow rate at which carbon sequestration increases or soil carbon increases. They are looking for easy options that might make them more money” [PE1].

As Bradford et al. (2019) argue, while there is a clear scientific consensus that rebuilding soil organic carbon is a desirable goal for improving soil health, there is a strong disagreement about “the advisability and plausibility of rebuilding soil carbon as part of climate mitigation initiatives”. Furthermore, Amundson and Biardeau (2019, p. 11654) claimed that “the promotion of this method to significantly alleviate our carbon dioxide imbalance is somewhat irresponsible and has political implications. The suggestion that soil carbon sequestration may be a ‘bridge’ serves only as a reason to yet further delay action”. Rather than placing the primary goal on carbon sequestration, the authors argue that efforts should be placed in developing a multifaceted framework that enhances farming methods, including better soil carbon management, which is always beneficial for soils health (e.g., enhances soil quality and fertility, reduces the use of inputs such as fertilisers).

In synthesis, non-political and apolitical approaches to soils prevail in the NSW political domain. At the state level, senior bureaucrats emphasise soils non-political character that justifies their exclusion from the policy agenda because a) there is nothing substantially broken, and b) even if something eventually needs to be fixed, a policy change will not necessarily produce the desired outcomes. Thus, better coordination between agencies related to soils, which are “quite mature for their particular purpose”, instead of promoting policy development is what is required, according to a senior official. At the federal level, soils are growing

in relevance, though co-opted by a political strategy that portrays soils as an apolitical (or politically neutral) eco-technological fix in climate change mitigation. This strategic framing simplifies soil problems by focusing on a particular soil function that is included in the technological package to achieve net-zero emissions, restricting a broader discussion about policy choices (Fawcett & Marsh, 2014) both in climate change mitigation and soil protection. Consequently, this framing contributes to foreclosing the development of coherent approaches that embrace the intricate mesh of functions and processes that could result in an overall improvement of soil health.

The effect of the ideologies embedded in these framings is the legitimisation of the government's policy choices that reaffirm soils depoliticisation and undermine the possibility for a transformational change. Furthermore, by naturalising the existing order of human-soils relationships, they discourage the discussion and inclusion of unorthodox perspectives that could contribute to Australian sustainable soils futures, such as, for example, Aboriginal knowledge and land management practices adapted to the particularities of each region (Hill et al., 2013; Pascoe, 2018) and agroecological principles in agriculture and food systems (Cross & Ampt, 2017; Iles, 2021). As Law and Lien (2018, p. 132) observe, naturalisation “works to reaffirm political limits: if the world is a certain way, then this means that it cannot be otherwise. There is no point in trying to change it”. In a similar vein, Parrique (2019, p. 42) argues that ideological power results in “routines and path-dependency” that obstructs “political imagination”, hindering novel ways of doing and thinking. However, latent alternatives might be surrounding the issue and waiting for a window of opportunity to emerge, as was analysed in Chapter 5 and will also be seen in the case of Uruguay, analysed in the following chapter.

6.3.2 Private interests and policy lock-in

Ideologies and interests are intrinsically connected and mutually shaped, although the weight of the influence of one on the other in decision making and policy outcomes varies (Levi, 1970). According to Gamble (2021), there is no consensus on

the definition of interest. He claims that interests “can be defined in terms of desires, intentions, values and needs, and very different accounts can be given according to which dimension is stressed” (2021, p. 67). In what follows, I will approach interests as the material expression of the predominant ideology previously described in terms of who benefited from keeping soils as a depoliticised issue.

More than 70 per cent of NSW land is privately owned (OEH, 2018), and agricultural land occupies around 81 per cent of the state (ABARES, 2016). Considering that agriculture is the human activity that most directly impacts soils, as Bartkowski and Bartke (2018, p. 2) claim, “it is inevitable to look at farmers and their land-use practices when the goal is to identify ways and means to make soil management more sustainable through proper soil governance instruments”. In legal terms, soils, through their attachment to the land, tend to be regarded as private assets. According to some interviewees, besides a firm pre-eminence of private property rights, there is an aversion to intervention across the state. For example, a soil expert working in the public sector said, “there is this really strong right-to-farm feeling, so people don’t like being told what to do” [Exp9]. In a similar vein, a policy entrepreneur observed that farmers are “such an independent-minded lot that they hate being told what to do” [PE1]. Along the same lines, a soil scientist said,

“At the moment, most farmers will go out and do whatever about their soil; there are better education programs now about how to do that properly without causing too much damage, but still damage occurs, agriculture by definition involves modification of the land” [Exp9].

The presence of private property rights, particularly due to their social construction as absolute rights⁶⁷ (Reeve, 2001), has been a primary argument for

⁶⁷ As Lockie et al. (2006) explain, property rights with the associated obligations are social constructs, thus, susceptible to being changed. However, as the authors argue, the framing of property rights in absolute terms means that owners understand they have “the rights to do whatever they like, whenever they like, with their own land, equipment, water and so on, irrespective of any negative impacts these actions may have on the ability of others to exercise their

restraining effective public policies aiming for soil protection in Australia. For example, Looney (1991) observed that in Australia, the “common law tradition of the superior rights of the private landowner is deeply rooted”, and this has been a major obstacle to developing land planning policies. In a similar line, Bates (1987) argued that Australian private landowners were historically “allowed to shape their own environments”. The extended belief that natural resources were unlimited and exploited for productive use at the landowner’s desire determined the pattern of use and management of natural resources in Australia (Bellamy, 2007). Moreover, the state government historically encouraged these kinds of attitudes by, for example, paying for land clearing. Although land ownership involves not only rights but also social obligations – and thus environmental legislation is not a breach of entitlements, but an inherent part of them – absolutist views arise when owners “feel threatened by the actions of the state or other claimants” (Reeve, 2001, p. 5). In this regard, Lockie et al. (2006, p. 34) claim that “[a]ttempts to challenge the absolutist interpretation of private property rights in the rural sector through the imposition of resource-use regulations are typically met with fierce opposition”.

Furthermore, neoliberal approaches to environmental governance have been widely adopted in Australia since the 90s, following discourses of small government, individual freedom, private property rights and commodification⁶⁸ (Cooke & Moon, 2015; Lockie, 2013). These approaches have sought to “facilitate

own property rights (for example, through the impact of soil erosion on downstream water quality)” (2006, p. 34).

⁶⁸ Engel-Di Mauro and Van Sant (2020, p. 61), departing from a definition of soils as “sets of interactions among organisms and physical materials and processes that take many different forms and have highly variable qualities, including formation times”, discuss the impossibility of their commodification. As a valuation process, commodification implies the assignation of use value and exchange value, which requires the individuation of an object so it can be considered “sufficiently homogeneous” – detachable and transferable to be tradable. Therefore, they argue that “the relationship between commodification and soils is complicated by the fact that soils are highly varying products of organisms (including us) interacting with each other and with physical materials (minerals, organic matter, water, air)” (Engel-Di Mauro & Van Sant, 2020, p. 60). Thus, whether soils can be treated as a commodity or not depends on how they are conceptualised (what is precisely appropriated and sold?), which is, as the authors conclude, connected to our position in capitalist social relations.

various forms of self-regulation, self-help and entrepreneurialism” (Lockie & Higgins, 2007, p. 1). Consequently, responsibility for soil conservation has been progressively transferred from the state agencies (e.g., Soil Conservation Service) and publicly funded programs (e.g., Landcare groups) to individuals and businesses, substituting a culture of social obligations and collaboration for another of cost-effectiveness and individual responsibility (Tennent & Lockie, 2013). According to Lockie et al. (2006, p. 37), this process of individualisation or devolution of responsibility rests on the assumption of governments that market-based tools will encourage producers to use their resources more sustainably, rather than regulations that are seen to “often generate unintended and perverse results”.

As a policy entrepreneur observed,

“[...] governments have tended to leave these [soil] complicated and flawed issues to the private enterprise to sort out. So, it is this idea that the power of the market, you know, will get to the right hands in the end, and they have the view that it is best not to interfere too much with that” [PE1].

A key aspect of neoliberal rationalities, as Jessop (2014, p. 211) argues, is “how it (re) defines some issues as private, technical or managerial, removing them from overtly political decision making and contentious politics”. To this rationale, market-based instruments (MBIs), such as conservation auctions, tenders and trading schemes, are the most economically efficient mechanisms to address environmental problems (Cooke & Moon, 2015), whilst regulation is deemed “cumbersome, blunt and ineffective” (Lockie, 2013, p. 91). MBIs seek to correct market failures by providing incentives to promote pro-environmental behaviour and sustainable management of natural resources (Gao et al., 2020). However, these tools that gained popularity since the 90s have been largely criticised for commodifying nature and creating markets where they were previously governed by regulatory and other non-market approaches (Harvey, 2007; Kosoy & Corbera, 2010; Gómez-Baggethun & Muradian, 2015). Although the Global Financial Crisis of 2007-2008 put the efficacy of these instruments under question, they still have

some traction among economists, policymakers and scientists (Gómez-Baggethun & Muradian, 2015). Furthermore, there is growing recognition that they “are not a panacea for solving any environmental problems” (Gao et al., 2020, p. 2).

Amongst the participants interviewed, there appears to be a slight preference towards these kinds of mechanisms over regulations when it comes to policy instruments for protecting soil resources. As a soil scientist said, “there have to be some carrots. That’s what works. That’s what makes the world go around. There need to be incentives to change behaviour, and there are no incentives” [Exp8]. Furthermore, he claimed that “it can’t all be legislation that’s a stick”. Another expert mentioned that, in order to promote good management practices for soil health and prevent soil disturbance, “it’s better to do it with the carrot rather than the stick” [Exp10]. However, a soil public official offered a different perspective mentioning that “the thing about incentives, depending on how it’s rolled out, is that they’ve got to have some kind of aspect dealing with longevity stuff. Sometimes the problem is that they don’t focus on long-term sustainability; there’s no follow up with the resource condition” [Exp9]. As Lockie (2013) argues, producers may use MBIs to internalise the costs of conservation that support production, but they tend to neglect the ecological values that don’t report a benefit to their output. We might think that experts’ proclivity towards market-based instruments could be justified in disciplinary biases because, as Janzen et al. (2021, p. 3) claim, soil science historically was inclined “toward yield-producing functions of land”. Also, in a context characterised by the diminution of soil issues and expertise in the public sector, it might be reflecting a more pragmatic attitude considering that neoliberal governments predicate these instruments. Furthermore, such preference can also resonate with farmers’ perspectives because, as a former soil official stated, “there have been so many misguided, wrong agricultural extension campaigns in the past that probably a lot of local landowners are quite jaded of the whole government. All they say is pay taxes, and nothing ever happens that is good for them” [Exp10].

If we accept that agricultural soils are a private asset valued for food and economic development, and if additionally, we adopt a free-market ideology, then

as Bartkowski and Bartke (2018, p. 3) argue, “there would be no need for explicit soil governance beyond the pure market mechanism”. But it is well known that markets left on their own emphasise short-term profits rather than long-term sustainability (Gomiero, 2016). Moreover, landowners’ individual decisions have impacts and consequences beyond their properties to the broader environment and, ultimately, to the entire community. In the 2016 State of the Environment report, it was acknowledged that although soils are, to a large extent, privately managed in Australia, “the impact of healthy, functioning soils on the environment as a whole – such as improving water quality, protecting biodiversity and mitigating excess greenhouse gases – means that soil is also a large public good” (Metcalf & Bui, 2016). Similarly, Windfuhr (2017) claims that soil functions and processes embody public values and address public needs, such as food supply assurance, filtering to protect water and air quality, and providing the infrastructure for human and non-human life. At this point, it is widely recognised that the bundle of property rights that a proprietor holds include a series of attributes that are both private (e.g., soil fertility) and public (e.g., biodiversity) (Bartkowski et al., 2018). Therefore, private property rights can never be absolute because, as Moroni (2018, p. 277) argues, “to have a market, we need to restrain property rights appropriately”, meaning that property rights must be regulated to avoid reciprocal harms⁶⁹. Moreover, as has been tirelessly emphasised in

⁶⁹ In a special issue of *Sustainability* “Assessment and governance of sustainable soil management” (Helming et al., 2018), scholars have provided justification for soil protection. For example, Bartkowski et al. (2018, p. 24) claim that hermetic protection of property regimes pose a challenge to sustainability because they do not guarantee they address social obligations – e.g., “motivating farmers to become stewards for the public and future generations, taking care of sustainable provision of the multitude of soil ecosystem services”. Therefore, considering the multi-functionality of soils, they propose an attribute-based approach to property rights, according to which the bundles of soil properties and functions that contribute to the different ecosystem services (attributes) should be treated separately because they imply “different property rights and different potential property right holders” (Bartkowski et al., 2018, p. 19). Though this perspective might be valuable for challenging absolutist discourses of property rights and recognising soils’ multiple contributions to life instead of a few relevant ones (e.g., agricultural productivity), it might also end up boosting markets for those publicly popular functions (e.g., carbon sequestration) and still neglect others despite creating incentives (e.g., cultural services). Hansjurgens et al. (2018), building on Pope Francis’ encyclical “Laudato Si” (2015), provide creation-ethical considerations for soil protection. In *Laudato Si*, Pope Francis claims that Christianity “never recognised the right to private property as absolute or untouchable and emphasised the social function of any form of

sustainability discourses, governments should protect the interests of others (intra- and inter-generationally). As a policy entrepreneur said, “[...] the actions that we take today have an impact on the benefits of future generations; they don’t yet pay taxes, they don’t yet vote, but governments have got an obligation to act on behalf of the future as well” [PE₂].

In addition to the private interests of landowners, a significant blocking power for policy change in NSW – as in the rest of Australia – comes from agroindustry lobby groups that exert a strong influence on the policy arena. As a policy entrepreneur observed,

“I think in agricultural soil management, there’s far too much influence from industry lobbyists like the fertiliser industry. They have a pretty old-fashioned way of going about soil assessment and management, and it’s very inadequate and incomplete, but they have lobbyists that are talking to ministers and so on. So, whenever there’s talk of emerging new ways of doing things, those lobbyists from industry tend to dampen things down and just try to keep things the way that they are” [PE₁].

Botterill (2016, p. 671) argues that the pervasiveness of the “agrarian sentiment” in Australia has rendered agricultural policy into an area of rarely “explicit ideological or partisan debate”. Thus, the sector that has been dominated by neoliberal economics in the past four decades remains rather unchallenged politically despite the emergence of new issues in the policy agenda (Botterill, 2005). Iles (2021, p. 19) also points out that the food industry in Australia has such power over policies, frameworks, values and preferences “that it is hard for alternatives to be taken seriously”. Furthermore, he claims that the neoliberal agricultural policy “looks ‘efficient’ but only because it excludes environmental, social, and other impacts” (Iles, 2021, p. 32). The exercise of structural power by

private property” and, thus, it is subordinated “to the universal destination of goods” (Francis, 2015, p. 73). This innovative text that articulates “ecology and injustice and the recognition of the power of the earth itself to act and to suffer” (Latour, 2016, p. 252), is used by Hansjogens and colleagues (2018) to discuss that restrictions to private property are justified if ecological degradation or mismanagement puts at risk the interests of society and public wellbeing.

these influential groups camouflages antagonisms from conflicting interests, depoliticising issues (Kenis & Lievens, 2014). Despite such concealment, as Gomiero (2016, p. 29) points out, “we should be aware that nothing is farther from reality than thinking that capitalistic industrial agriculture runs on a truly free-market basis. Almost no other sector is as politically influenced as agriculture”. Nevertheless, by covering up antagonisms in the agricultural sector, business as usual and the capital accumulation of economically powerful (agribusiness) groups⁷⁰ remain undisputed (Engel-Di Mauro, 2014).

6.3.3 Incomplete information and policy subsystem biases

The supply of information plays an essential role in agenda setting because policy subsystems usually are “based on extremely incomplete models of the policy issue at hand” (Jones & Baumgartner, 2005, p. iv). Thus, through a set of institutions and policymaking arrangements, these subsystems process the flows of information (i.e., filtering, blocking or amplifying) that contain definitions and potential courses of governmental action about real-world problems (Workman et al., 2009). Science and policy tend to converge when they are driven to address complex societal and environmental problems that require synthesising diverse sources of information and the viewpoints of scientists, policymakers and other relevant stakeholders (Görg et al., 2016). Therefore, in the best scenarios, science-policy interfaces will “allow for exchanges, co-evolution, and joint construction of knowledge with the aim of enriching decision making” (Van Den Hove, 2007, p. 815).

⁷⁰ For example, the Soil RD&E Strategy seeks to increase agricultural productivity – by intensifying the use of resources more efficiently and sustainably, a view that is shared across the Australian agricultural science and policy community (Iles, 2021) – and become a major exporter of food. As the Prime Minister stated in his speech to the Press Club, “The National Soils Strategy is one pillar of our Ag2030 plan that’s backing the sector’s ambition to be a \$100 billion industry”. This implies a 40% increase from its current total gross value, estimated at approximately \$60 billion (Weragoda & Duver, 2021).

The (old) Soil Conservation Service⁷¹ of NSW used to be a relevant public organisation where science, extension and policy met. However, since its dissolution in the 1990s, the public investment in soil issues and the number of soil experts in the state government waned, affecting the quality and quantity of the information produced by the public sector. As a soil scientist working in academia said,

“The knowledge of soil within [the state] government agencies is the poorest in Australia. The investment in gathering that information seems to have completely stopped, but it’s been bad for a long time [...] twenty years ago, I would say New South Wales had some investment, but they were behind. Now, it is virtually non-existent. I think it’s because if you have good personnel, then things don’t go away and keep at a level of improvement, but they have disappeared from the government agencies” [Exp8].

Against this background, it is not surprising that the extension services provided by the government to farmers managing agricultural soils were criticised by various interviewees because, in their view, “the government is not producing useful data for farmers to make sound decisions” [PE2]. Consequently, farmers have been receiving soil management advice primarily from private consultants rather than public regulatory bodies, raising concerns about the influence of specific commercial interests. In this vein, a policy entrepreneur said,

“The reality is that most farmers that are in Central or Western New South Wales are in a sort of big financial trouble. Many of them are advised by what we call the ‘snake oil salesman’, people who give you very poor advice.

⁷¹ Today, the Soil Conservation Service is a “fully commercial business” that operates within the Local Land Services of the Department of Primary Industries, providing assistance in land rehabilitation, erosion control, project management and resource protection. Extracted from website: <https://www.scs.nsw.gov.au/about-the-soil-conservation-service/the-history-of-the-soil-conservation-service> [Accessed: 25 September 2021].

So, farmers in financial trouble are getting into even deeper financial trouble because they are not given the correct advice” [PE1].

Along similar lines, another participant said,

“Unfortunately, these days, most of the advice given to farmers is given to them by industry, by people wanting to sell them fertilisers, chemicals. Not that that’s so bad because many regional rural merchants want their farmers to keep farming and not go broke, but they don’t always have the interest of the soil at heart; it is more the profits that farmers make” [PE2].

An interviewee explained that in addition to the lack of investment in soils issues and shortage of knowledgeable personnel, a further reason why farmers are not provided with information “in a form that’s useful to them” [PE2] is the absence of an integrated framework for soils assessment and management between diverse public organisations (i.e., DPI, OEH⁷² and EPA). In his view, there is a profound disconnection among these agencies that have “their own separate opinions and ways of doing things”. Moreover, he pointed out that they have “quite different views about the scale of data that needs to be collected or what data needs to be collected”. This internal disconnection is critical because, on the one hand, it denotes that there is “no ownership of soil” [Exp8] within the government, affecting, as some interviewees observed, the capacity for advocacy or promoting changes from the inside. On the other hand, it challenges the engagement with the scientific sector because there is no clear interlocutor. For example, an academic said that his research group does not have a dialogue with the government “I’ve never managed to get a project working with them to do something. I’ve tried, but every time you start a conversation, they get restructured and you don’t know to whom you’re talking to anymore. So, it’s quite frustrating” [Exp8]. What is more, a policy entrepreneur said that “the state departments are jealous in sharing information and sometimes don’t want to let you have access to data” because they

⁷² The Office of Environment and Heritage was operative until 2019. Since then, its functions have been transferred to the Department of Planning, Industry and Environment (DPIE).

see competition in collaboration and they want “to protect their positions and their jobs” [PE2]. This sentiment might be explained by the fact that others outside the government are producing information that sometimes supersedes the quality of the state’s data. For example, the private sector, particularly the more profitable industries, “like cotton and grains and some of the horticultural industries, they collect their own data, and some of that is better than what the state collects” [PE2].

Furthermore, a former soil bureaucrat mentioned that the scarce public efforts put into soil research are “all about primary industry production” [Exp10], but it is “not about the resource” as another expert pointed out [Exp8]. Jones and Baumgartner (2005) explain that policy subsystems’ biases tend to ignore the “bits” of information that do not correspond with the dominant view in that policy arena. Therefore, the kind of data the government is interested in reaffirms a productivist political ontology⁷³, while other types of information (and political ontologies) are somewhat overlooked.

The difficulties in generating and accessing comprehensive information about the status of the resource across the state suggest that decision makers might be lacking sufficient inputs for considering soil policy development. As an interviewee pointed out, “policymakers need information, and there’s no one in this government creating any information for these policymakers. By the same token, no policymakers are asking for any information” [Exp8]. This circularity, according to which relevant information is not being produced and no one is claiming for its production, provides another expression of how agenda control can be exerted through non-decision making. Overall, over the past decades, soils have been progressively “organised out” of politics (Schattschneider, 1960) by mobilising the

⁷³ The creation of the Soil Cooperative Research Centre (CRC for High Performance of Soils) in 2017 aligns with this perspective. The CRC program of the Commonwealth government aims to improve industry competitiveness and production by supporting industry and research partnerships. The Soil CRC seeks to connect farmers with soil science to provide them with “the knowledge and tools they need to make decisions on extremely complex soil management issues” (Soil CRC, n.d.). Although the principal objective is to improve the productivity and profitability of farms but not the protection of the environment, an interviewee explained that it also seeks to ensure that the research and management practices they promote “do not degrade or environmentally damage the soils that we have”.

bias of the political system prioritising the downscaling of publicly funded actions and transferring responsibilities to the private sector to deliver outcomes. Generation and circulation of information can be used, thus, to wield blocking power (Bachrach & Baratz, 1962; Birkland, 2007) in such a way that decision making is favourable to what is regarded as the “safe issues” to the status quo. Introducing a policy change in the public governance of soils can be risky for the ruling Liberal-National Coalition Party because, as a policy entrepreneur argued, “many landholders are very hostile towards new frameworks and new regulations that have a Labor party origin. So that becomes very tribal and difficult to get on with” [PE1]. Therefore, enacting soil policy is far from being a priority because it does not translate into public popularity amongst their constituents (and thus into votes). In this regard, a senior official stated that,

“When you look at the policy agenda, there are so many other things that come in front of that [soil policy], you know, conservation strategy, a net-zero emissions strategy, a climate change strategy and policy, all of those sorts of things are higher-order in terms of [the current] government focus” [PO2].

How issues are prioritised by a government or the “politics of attention” in policymaking is, according to Jones and Baumgartner (2005), related to how information is processed in politics considering the information flows that vary in quality, uncertainty and ambiguity. The authors define information processing “as collecting, assembling, interpreting, and prioritizing signals from the environment” (2005, p. 8). A fundamental aspect of this theory is that policy change is connected to how policymakers detect, interpret and prioritise those environmental signals. Signal misinterpretation can occur due to “ideological bias, an economic interest, or a political position that makes them support some outcome rather than another” (2005, p. 9). This results in disproportionate information-processing as some elements will be ignored, particularly public benefits such as intergenerational equity, leading to the use of inappropriate discount rates in economic analyses, whereas others will receive excessive

attention, such as the contemporary maximisation of private benefits. Some problems are not more important than others *per se*, but instead framed as such by the intentional and biased selection of specific environmental signals and bits of information based on the ideologies and interests of policy groups. Jones and Baumgartner (2005) argue that policy subsystems can filter information and “insulate policymakers from competing information, or from new information that does not correspond with their vision, understanding of the policy, or goals” (2005, p. iv). Therefore, besides the selection bias that reinforces politicians’ worldviews, they might not be exposed to certain types of information or, conversely, be exposed to the kind of information that supports their worldview.

In synthesis, the consequences of the progressive degradation of the soil knowledge base in the NSW public sector are multiple and relevant to the current governance of soils. First, it has pushed towards the privatisation of advice in the management of agricultural soils, influenced by the commercial interests of the agroindustry complex that are not necessarily concerned with sustainability. Second, the internal disconnection and disparities in the information collected across the different state agencies contribute to the fragmented governance of soils. Third, this also results in a lack of collaboration and mistrust in sharing information with others outside the government, hindering the development of a more effective science-policy interface. In addition, the lack of a clearly identifiable interlocutor inside the government obstructs such dialogue. Furthermore, the policy subsystem biases support data generation for the primary industries sector, confirming a productivist political ontology of soils in the policy arena, which is self-indulgent with the governments’ ideology and interests, reaffirming soils depoliticisation.

6.4 Conclusions

This chapter explained how power is mobilised in soils framings by exploring how ideologies, interests, and information are articulated in the dominant approaches to soils based on the discourses of relevant policy actors at the science-policy

interface. The analysis reveals that two framings coexist in the policy arena endorsed by neoliberal governments at the federal and state levels: the well-established purely productivist framing with a focus on the sustainable intensification of an “unbreakable” resource that is primarily a non-political private asset, and the new eco-technological fix framing that portrays soils as an apolitical matter for climate change mitigation that according to the national government, could provide up to 20 per cent of abatement (Australian Government, 2021) and which is also functional to private landowners and corporate agroindustry interests. Both framings understate the role of policy in producing desired (sustainable) outcomes in soils management and instead emphasise the univocal role of technology and innovation in achieving these. Furthermore, at the state level, the lack of complete information about the status of soil resources conflated with the policy subsystem biases in selecting and processing data reinforces the dominance of these depoliticising framings.

However, to soil scientists and policy entrepreneurs interviewed in this research, there are several reasons to demand soils policy development due to the public benefits they provide and the necessity to create awareness and promote sustainable management practices – that could also contribute to climate change mitigation efforts – to secure healthy soils for future generations. Such motives have also been endorsed in the literature challenging the productivist-private asset framing (Bartkowski et al., 2018; Gomiero, 2016; Hansjürgens et al., 2018) and the eco-technological fix for climate change (Amundson & Biardeau, 2019; Bradford et al., 2019).

This chapter demonstrates that the current soils policy vacuum in NSW, rather than expressing a non-political or apolitical issue in the policy arena, manifests a *purposely marginalisation of “the political”* in soils by orchestrating depoliticising framing strategies that exclude the subject from the policy agenda. Framing as a particular form of discourse is depoliticising when it actively conceals the political dimension of an issue at stake in the public sphere (Kenis, 2019). Power is mobilised through framings to organise a constitution of the social (Mouffe, 2005a) and encourage constituents to think about issues along particular lines

(Chong & Druckman, 2007) by seeking “to manufacture consent or construct a consensus around an otherwise contingent phenomenon” (Fawcett & Wood, 2017, p. 238). In the case of soil degradation, the lack of “sensitivity to ecological contingency, but especially a lack with respect to social relations of domination” has been a primary obstacle to addressing this problem (Engel-Di Mauro, 2014, p. 61). As claimed in the previous chapter, being cognisant of depoliticising dynamics and the exclusions that it generates (Mouffe, 2005a) is a precondition for challenging them (Meyer, 2020) and making “the democratic public mindful of the biases and exclusionary implications of the dominant view” (Rosenthal, 2019, p. 253). As Kenis and Lievens (2014, p. 4) argue, “the same characteristics that make environmental issues so liable for depoliticisation could, interestingly, turn them into a field of politicisation par excellence, understood as a scene composed of a multiplicity of conflicting positions which can become visible and therefore contestable”.

Examining the power dimension of framing helps us understand how actors “value and engage with soils” (Salazar et al., 2020) and be in a better position to confront those values that aim to “sustain the unsustainable” (Blühdorn, 2007) and propose alternative visions such as those driven by an ethics of care, conviviality, and ecological integrity. In Australia, for decades, scholars have pointed out that a “quarry” mindset that emphasises economic development at the expense of the environment has historically pervaded the country’s policymaking (Birrell et al., 1982; Crowley & Walker, 2012; Mercer & Marden, 2006). Utilitarianism has been a particularly influential doctrine in Australian politics, which overall operates with a focus on pursuing human well-being “often to the exclusion of non-human animals and of environmental sustainability” (Barry, 2019, p. 47).

But if we acknowledge that soils are an increasingly impaired natural resource to a great extent due to unsustainable human practices, then enacting environmental policy (e.g., regulations, market-based instruments) is a potentially powerful instrument to drive change. Environmental policies have a fundamental role to play in securing the basis for present and future life. The current soils policy gridlock in NSW represents a risk for ongoing degradation processes, and

therefore, policy reforms that care about farmers' livelihoods and soils ecological vitality are necessary for their sustainability in the long term. Policies aiming to regulate human-soils relations should set the socio-environmental goals that express the normative agreements about how we should co-exist, what is acceptable and what is not in that interaction and address the asymmetry of power between individual owners and the public interest. Furthermore, the contents of such reforms should be more openly debated within society and engage a broad spectrum of actors in a conversation between diverse human-soils political ontological imaginaries (e.g., Aboriginal land management, agroecology, permaculture). Though this is not suggesting that policy equals the mastery of nature, I believe that beyond the unpredictable and uncontrollable forces of nature, there is an ethico-political responsibility of the state to those with whom we co-exist, and, moreover, depend on to survive.

Chapter 7

Justice for soils: exploring emergent notions from the Uruguayan case

The Anthropocene hypothesis suggests that humans have become a geophysical force with the agentic capacity to shape the Earth system. The changes in the global climate due to the increasing anthropogenic emissions of carbon dioxide and methane, the changes in the land surface through agriculture, deforestation, extractivism and urbanisation, the acceleration of the rate of species extinction, the presence of technofossils in soils and water such as plastic, aluminium and radionuclides, and the alteration of geochemical processes and flows owing to the use of fertilisers such as nitrogen and phosphorus, are, for some scientists, sufficient evidence to claim that we have entered a new and different geological epoch (Steffen et al., 2011; Waters et al., 2016; Zalasiewicz et al., 2010, 2021). To its advocates, the Anthropocene is proof that the unprecedented magnitude of anthropogenic impacts on the biophysical world makes it possible to assert that it has been we, humans, not nature, who inaugurated this new era.

Despite still being under scientific consideration as a geological epoch, the Anthropocene (Crutzen, 2002; Crutzen & Stoermer, 2000) has firmly entered the scientific and environmentalist lexicon in the past decade, sparking heated debate on several fronts and disciplinary fields. Amongst geologists, “the guardians of the Earth timeline” (Davison, 2019), opinions are divided, as for many, there is yet not

enough stratigraphic evidence (fossil records in rock layers) to claim the abandonment of the Holocene (Carey, 2016), placing the term in pop culture rather than the scientific domain (Autin & Holbrook, 2012). However, within the social sciences and humanities, the concept has deeply permeated beyond the strictly geological (Clark, 2015), raising debates about its causes, responsibilities and implications (Castree, 2021). These multifaceted discussions have been referred to as the “consequential metalevel of the Anthropocene concept” (Leinfelder, 2020, p. 4), which deals with matters of culture, politics, institutions, justice, ethics, sustainable futures, and education.

If we conceive the Anthropocene not as the triumph of humans but rather as the mess we have created, it is a useful epistemic tool “for understanding what is happening to us” (Bonneuil & Fressoz, 2016, p. 14), offering a “politically savvy way” for communicating to the public the magnitude of the ecological crisis (Castree, 2014, p. 14). From such a perspective, the Anthropocene is a cry-out for urgent political action to prevent further ecological devastation and support the flourishing of humans and nature (Chakrabarty, 2018; Meadowcroft, 2019). Consequently, this equally outrageous and provocative concept is an invitation to rethink political institutions and core values such as justice and sustainability (Dryzek & Pickering, 2019). Western thinking has conceptually divided the social and the natural in an attempt to control the latter by the former “in the name of progress” (Pellizzoni et al., 2022), detaching nature from humans and excluding it from moral consideration. But as Wienhues (2020, p. 2) argues, “the human takeover of the Earth’s ecological space – its resources, ecosystem benefits and actual spaces – that ultimately leads to species extinctions constitutes a genuine and non-metaphorical injustice; it should be discussed and responded to as a matter of justice”. Since the levels of human-induced environmental degradation have put into moral question the exclusive provision of justice to one species (Strang, 2017), claims for the amplification of the justice agenda to the non-human world have been gaining terrain (e.g., Baxter, 2005; Low & Gleeson, 1998; Schlosberg, 2007; Washington et al., 2018; Wienhues, 2020).

Therefore, the Anthropocene provides sufficient reason to include non-humans in the community of justice and, thus, in sustainability discourse and politics. This chapter aims to explore the role of justice in soils framings by analysing the recent policy developments in Uruguay. Uruguay's "flagship soil conservation policy" – the Soil Use and Management Plans (SUMPs) – (Baraibar, 2020; Zurbriggen et al., 2020) has been praised by the international community (e.g., FAO & ITPS, 2015; World Bank, 2017). Overall, the public approach to soils, which includes other policies such as the National Adaptation Plan to Climate Variability and Change for the Agricultural Sector (NAP-Agro, 2019) and the Agroecology Law (2018), has rendered Uruguay a "global standard bearer of soil governance" (Peake & Robb, 2022). Therefore, considering that the Uruguayan soil protection regime has become an example internationally, this chapter explores what ethical and justice notions emerge from this case that could contribute to soils re-politicisation and claim their political nature. With that aim, this chapter addresses the following research question: How can soils be reframed to secure sustainable and just soil futures following Uruguay's recent soil policy developments? Supported by the following sub-questions: Where is placed the responsibility for caring about the integrity and vitality of soils? What is recognised as the subject of policy, and how? Who speaks for soils, and how are they represented in the policy arena?

This chapter is structured as follows: first, it addresses how prevailing notions of justice are challenged by a critical stance of the Anthropocene that seeks to extend the realm of moral considerability to the non-human world. From the literature review, I conclude that the capabilities approach to ecological justice justifies the inclusion of soils in the community of justice. Second, I present the Uruguayan case and describe the conditions that led to the development of the SUMPs. Third, I delve into the justice dimension of the PoFF and analyse the Uruguayan soils conservation policy by exploring three key categories I relate to ecological justice: responsibility, recognition and representation. Finally, I synthesise the findings and highlight the challenges of addressing policymaking with an ecological justice lens.

7.1 Justice in the Anthropocene

To scholars of critical environmental politics, accepting the Anthropocene thesis entails rethinking our relationship with the Earth in more responsible, respectful, caring and convivial ways (e.g., Biermann & Lövbrand, 2019; Death, 2014; Pellizzoni et al., 2022). To others, particularly those situated within ecomodernist and ecopragmatist thinking (Arias-Maldonado, 2020; Asafu-Adjaye et al., 2015; Ellis, 2011; Lynas, 2011), the new era reaffirms the capacity of humans to shape the biosphere (Williams et al., 2015). This view suggests that all biophysical processes and living entities are now dominated by humans who have the opportunity of creating a “Good Anthropocene” that will continue supporting human prosperity and reverse or amend ecological damage. In other words, they embrace the Anthropocene with the optimism that our species is capable of adapting to the new planetary conditions and overcoming ecological limits with science and technology (e.g., geoengineering of the climate system, innovation and intensification of nuclear energy, agricultural intensification) that will decouple economic growth from nature. Instead, critical scholarship claims that the new era is the “final proof of the damage done by techno-industrial hubris” (Hamilton, 2015) of capitalist civilisation (Moore, 2016; Swyngedouw & Ernstson, 2018). Hence, those who do not see the Anthropocene as the triumph of humans⁷⁴ but as the dangerous and unpredictable alteration of the Earth system due to the expansion

⁷⁴ There are two important objections to the concept of the Anthropocene. On the one hand, scholars emphasise the centrality of one species – that is, humans – as the geological force changing and dominating the Earth, reinforcing human hubris and the nature/culture divide (Crist, 2013; Haraway, 2016; LeCain, 2015). In this regard, Haraway (2015, p. 159) claims that “[n]o species, not even our own arrogant one pretending to be good individuals in so-called modern Western scripts, acts alone”. Therefore, to new materialists, the Anthropocene thesis works against their argument of the non-dominative implication of non-dualist ontologies (Pellizzoni et al., 2022, p. 40). On the other hand, the concept has been criticised for alluding to a homogeneous subject, humankind, obscuring the unequal power and influence of humans in driving planetary transformations (e.g., Haraway, 2015; Malm, 2015; Malm & Hornborg, 2014). Various alternative terms have been suggested, all trying to convey more properly and more fully the underlying causes for the current ecological crisis, such as the “capitalocene” (Moore, 2016), “growthocene” (Chertkovskaya and Paulsson, 2016), “technoscene” (Hornborg, 2015), “anthroscene” (Parikka, 2014), “manthropocene” (Raworth, 2014), “econocene” (Norgaard, 2013), “plantationocene” and “Chthulucene” (Haraway, 2015).

of human (extractive, capitalistic) activities (“Bad Anthropocene”) claim that what needs to be managed is not the planetary biophysical processes and living entities, but the way we relate to them. As Fremaux and Barry (2019, p. 172) state, “[t]he great challenge that lies ahead of us is not the further humanization of the planet but, rather, the further humanization of humanity”. Understanding our positioning in the world in relational terms could awaken sensitivities that capture our interconnectedness with our biophysical milieu in processes that, when interrupted or damaged, affect the relationships through which we are constantly co-becoming (Bawaka Country et al., 2016). Relational thinking helps us, thus, to redefine our relationships with nature in “more ethical and sustainable ways of living and doing” in reciprocal linkages between humans and non-humans (West et al., 2020, p. 314). When we think, for example, about the degradation of soil ecosystems, what we are witnessing, as Krzywoszynska and Marchesi (2020, p. 191) argue, is the “very real breakdown of the crucial relation between humans and soils”.

Although the Anthropocene is not something to be welcomed or embraced, neither is it helpful to fear it or lament it. It is inescapable, and thus, we must negotiate it and learn to cope with it (Dryzek & Pickering, 2019). That negotiation opens an opportunity to rethink our relationship with the biophysical world that we have exploited at the expense of its non-humanity based on an instrumental rationale that alienated nature is seen as an expendable economic subject (Strang, 2017). Against this background, environmentalists have been persisting with the necessity to give greater recognition to the non-human⁷⁵ and to control environmentally destructive actions (White, 2008). Consequently, the Anthropocene should invite us to rethink who or what is now a political actor, has rights, and deserves representation in the political arena (Castree, 2019), providing impetus and justification for a normatively oriented work that “includes noticing

⁷⁵ For the sake of simplicity, I use the wording “non-human” instead of “more than human” or “other than human”, acknowledging, as Celermajer et al. (2021, p. 121) pointed out, the potential problem of these terminologies in recentring and reifying the human as a singular benchmark.

how other creatures are affected by human politics and generative of human politics” (Wapner, 2019, p. 219). Furthermore, it compels us to reconsider the very notion of justice since “existing ideas of justice could be complicit in accelerating the ecological risks that humanity faces in the Anthropocene” (Dryzek & Pickering, 2019, p. 65).

Justice is conceived in varied and contested ways as an ideological concept (Steger et al., 2012; Strang, 2017), institutional virtue (Dworkin, 2002; Rawls, 1971), and social practice and guidance for action (Bell, 2017; Wienhues, 2020). In practical terms, justice is a specific domain within ethics that is of special relevance since it is directly connected to institutional protection and legal implementation (Wienhues, 2020). Of course, as Schlosberg (2012, p. 88) argues, justice is a “human construct, and applicable only to human behaviour”, yet our relationship with the natural world has impacts that affect its functioning and thus should be understood within a framework of justice. Therefore, how nature and environmental degradation are framed in terms of (in)justice has implications for decision making. Lal (2019, p. 81A) has recently claimed that “soil degradation, pollution, and depletion is a moral and ethical wrong that must be stopped”, proposing attributing legal rights for soils that are not guided by economic interest but for the sake of the good of the planet. Protecting the rights of soils to exist and flourish does not mean that all forms of using soil are unethical or illegal – only those practices that degrade it and destroy its functionalities (Lal, 2019). Thus, exploring notions of justice for soils as part of the exercise of critically examining framings with the PoFF (Figure 7.1 below) seeks to unpack the ethical justifications for actors’ actions and decision making, and its effects in terms of politicisation or depoliticisation of human-soils relations.

Contemporary liberal democracies and political thinking have been greatly influenced by modern liberal theories of justice (Barry, 1989; Dworkin, 2002; Nozick, 1974; Rawls, 1971), primarily concerned with providing justification for the just distribution and procedures to allocate social goods (e.g., income, welfare, opportunities) amongst members of society based on principles such as fairness, equality, entitlement, and efficiency. Although liberal accounts of justice are

diverse depending on what is held as the substantive ethical principle⁷⁶, they are all grounded in anthropocentric ethics in which the locus of value is the individual – a rational and autonomous individual capable of communicating, cooperating and reciprocating. From this ethical perspective, justice is limited to humans because they are the only entities with the capacity for reasoning, elaborate judgements and engaging together in cooperative practices. Consequently, modern liberal theories of justice exclude non-humans based on the assumption that they do not contribute directly to the common pool of social goods (Srinivasan & Cochrane, 2020), nor are they holders of “the right attributes that trigger moral considerability” (Wienhues, 2020, p. 8). Rawls (1971) argues that although justice is not the appropriate way to relate to the natural world, we owe it duties of compassion and humanity.

However, the increasing levels of environmental degradation have put under question the authority of anthropocentric perspectives that confine issues of justice to relations among humans, something that is not only morally questionable but it is also perilous (Strang, 2017). As many scholars claim, anthropocentric theories of justice are grounded in a perspective of species exceptionalism that foregrounds the superiority of humans and their separation from nature⁷⁷ based on their moral authority over the rest of the natural world

⁷⁶ For example, Rawls, Dworkin and Barry’s philosophical approaches are committed to an egalitarian ideal of fair distribution of welfare and resources, according to which the role of government is to ensure just conditions for citizens to exercise their individual freedoms and rights to fulfil their necessities and preferences (Cohen, 1989). On the other hand, Nozick’s libertarian philosophy, inspired by the Lockean right of self-ownership and the primacy of individual liberty, proposes the minimal state and the market as the appropriate institution for the just distribution of goods amongst citizens (Roemer, 1996). Critiques of liberal theories of justice came from, for example, communitarians that emphasise cultural values and the contextualisation of justice instead of universalist aspirations of a substantive principle of justice (MacIntyre, 1988; Sandel, 1982; Walzer, 1983), and feminists who revindicate the politics of *difference* and *recognition*, arguing that the ideal of egalitarian justice must be sensitive to gender and excluded groups (Fraser, 1997; Okin, 1989; Young, 1990). Overall, these scholars claim that the subject of justice is the collective instead of the individual, proclaiming the importance of values such as solidarity, social and affective virtues. For them, the avenue for achieving justice is not from the individual to the collective but the other way around – starting from ideas of citizenship, community and public goods (Lacey, 1992).

⁷⁷ New materialisms criticise such division because it imposes humanity’s dominance over nature, regarding the latter as inert matter without agency and moral values. It is unquestionable, as Jane Bennett (2004, p. 365) argues, that “humans are always in composition with nonhumanity, never

(Celermajer et al., 2021; Plumwood, 1999; Schlosberg, 2014; White, 2008). Although weak versions of anthropocentrism⁷⁸ sought to accommodate arguments for environmental protection and policymaking, they still privilege an instrumental view of nature (as a means to human ends). Still, the harm and violence caused by the extractive rationale of developmentalism to sustain human progress and consumption patterns in a limited biosphere are no longer tenable (Srinivasan & Kasturirangan, 2016). Following Rawls's precept, we need new "public frameworks of thought" to stimulate public reasoning and create sensitivity, in this case, towards the non-human world. As Martín-López and Montes (2015, p. 700) observe, "we cannot change the limits of the biosphere and the physics of nature, but we can change human social systems". By recognising the moral considerability of ecological entities, we can justify their protection in public policy and limit the developmentalist ideal of constant human expansionism, providing conditions for the thriving of all life (Crist, 2015; Kortetmäki, 2017). This requires as Bell (2017, p. 281) explains, "a fundamental reconstruction of key contemporary liberal ideas", most notably the conception that subjects of justice are "reasonable" and "rational". In other words, we need alternative framings of justice that can include non-humans as political subjects.

outside of a sticky web of connections or an *ecology*". However, dualisms such as nature/society are both helpful and unhelpful because humans are at once "distinct from nature and also natural beings" (Meadowcroft, 2019). In this vein, I concur with scholars who claim that a distinction is useful to foreground discriminations against non-humans without falling into modernist dualism (Fremaux & Barry, 2019; Kopnina, 2016). Drawing on critical theory, Fremaux & Barry (2019) observe the existence of a dialectic interdependence between nature and society: nature is constructed discursively through language and empirically through human practices, and yet, nature produces society "and also remains a principle of production on its own which displays processes that societies cannot control, know, or manage" (Fremaux & Barry, 2019, p. 185).

⁷⁸ Norton (1984) distinguishes two forms of anthropocentrism: strong and weak. The former values the non-human world as instrumental to human needs, interests, and desires and is moved by the satisfaction of individuals' preferences (that can be consumptive and exploitative). The latter claims that individuals can shape their preferences in a carefully deliberated way consistent with their worldview. Since humans are interconnected with other living species, they can value (without appealing to intrinsic worth) the harmonic coexistence with nature and healthy environments to the continuation of human life. Consequently, he proposes adopting a pragmatic view of environmental ethics that retains humans at the centre of moral consideration and appeals to stakeholders' deliberation and open debate to find solutions to environmental problems (Loman, 2020).

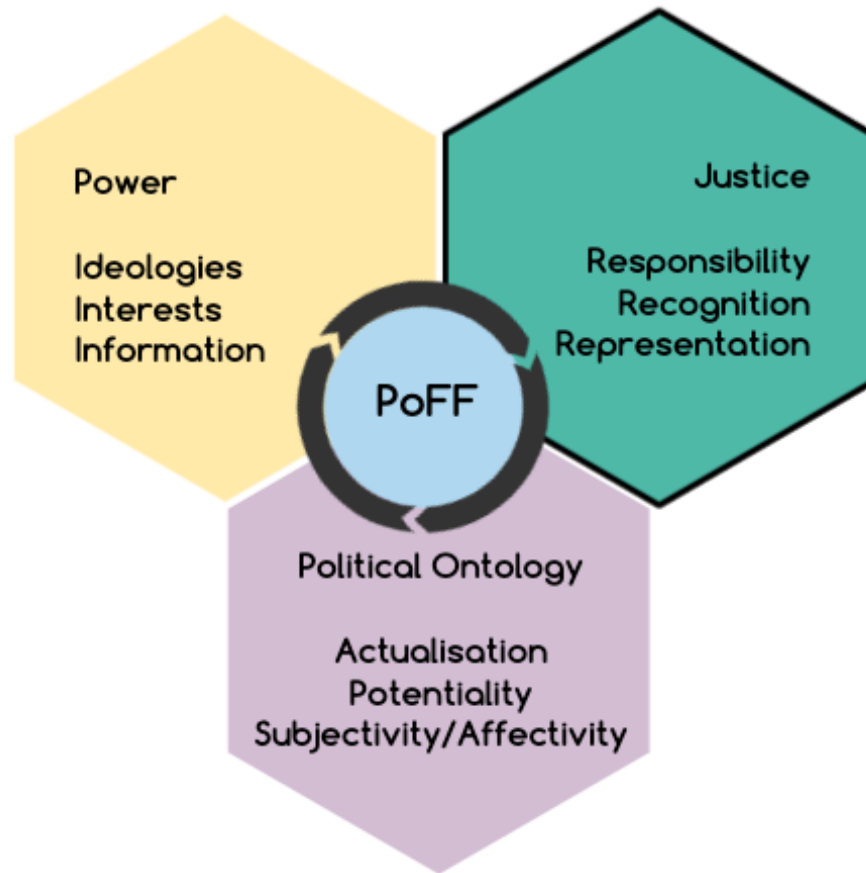


Figure 7. 1 This chapter explores the justice dimension of the Politics of Framing Framework. See Chapter 4 for a detailed introduction of the PoFF.

Non-anthropocentric theories of justice⁷⁹ seek to amplify the justice agenda by providing justification for the institutional inclusion of non-humans' protection and promoting changes in attitudes towards nature (Bayram, 2016; Kortetmäki, 2017; McShane, 2014; Schlosberg, 2014; Wienhues, 2020). These extensionist approaches aim to provoke a shift in thinking from nature as something we use and own to something that holds inherent value and that we are responsible for: welfare is not restricted to our species but all dwelling on the planet (Bell, 2017; McShane, 2014). Nevertheless, claiming intrinsic value to include the non-human

⁷⁹ Addressing all these frameworks exceeds the scope of this review. However, it should be noted that of late, several justice demands have emerged, such as multispecies justice (Celermajer et al., 2021; Tschakert et al., 2021), socio-ecological justice (Pope et al., 2021; Yaka, 2019), and planetary justice (Dryzek & Pickering, 2019).

in the community of justice is a controverted issue that is at the core of environmental ethics cleavage between anthropocentric and non-anthropocentric positions. According to anthropocentric perspectives, intrinsic value means that value is independent of a human valuer, and since it cannot be weighed, measured or compared, it is not useful in environmental decision making (Justus et al., 2009). Counterarguments point out that the value can be inferred from the autonomy of nature, the possession of its own telos beyond humans' interests and intentions, uniqueness, sentience, complexity, creativity and diversity (Arias-Maldonado, 2015; Cafaro, 2017). In this vein, Bayram (2016) claims that intrinsic value, unlike instrumental value, cannot be independent of a valuer; still, humans can subjectively value things not for the benefits they would bring to them but for the sake of the other. In her words, intrinsic value "is not the value that is 'in-itself' owned by an object because of the object's intrinsic properties; but the value ascribed to something 'for-its-own-sake', not for the sake of consequences it might bring" (Bayram, 2016, p. 8). Not all environmental philosophers concur on the necessity of claiming intrinsic value to justify conservation policies; this is primarily the view of pragmatists such as Bryan Norton (Sandler, 2012).

Non-anthropocentric approaches to justice vary depending on how far they claim justice can be extended (Srinivasan & Cochrane, 2020). These perspectives are divided between those who consider *individual* living entities or specimens as subjects of moral worth (i.e., sentientism and biocentrism) and those who include *collective* entities with lower degrees of individuality, such as species and ecosystems (i.e., ecocentrism) (Bell, 2006). The first approach that sought to extend moral consideration beyond humans came from sentientist ethics (Regan, 1983; Singer, 1975), which underpinned the animal justice theory (Garner, 2013; Nussbaum, 2006). To this view, all beings that can experience pain and pleasure are morally considerable. In contrast, non-sentient entities have no value in themselves but the instrumental one of supporting sentient animals' welfare (Hiller, 2017). To many environmentalists, this was a restrictive perspective on the constitution of the community of justice, which neglects non-sentient entities that allow all creatures to flourish (e.g., Callicott, 1984; Dobson, 1998).

Against this background, the ecological justice concept emerged (Low & Gleeson, 1998), proposing a more expansive agenda for justice building on life-centred ethics – i.e., biocentrism (Baxter, 2005; Wienhues, 2020) and ecocentrism (Schlosberg, 2007). Biocentrism extends moral consideration to all individual living beings that have a good of their own, as proposed, for example, in Schweitzer’s (1987) ethical principle of “reverence for life”, according to which it is good to maintain (human and non-human) life and it is bad to destroy it. Charles Taylor’s biocentric egalitarianism claims equal treatment amongst all living creatures providing ethical principles in case of conflicts of interest (1986). On the other hand, ecocentrism or holism goes beyond individual living beings by including ecosystems and species as holders of intrinsic value. Aldo Leopold’s “land ethic” is considered a classic form of ecocentrism (McShane, 2014) that inspired many environmental philosophers⁸⁰. Leopold (1949) understood that the expansion of the boundaries of ethics to our relationship with the land (including soils, waters, plants, and animals) implied overcoming the commodification of nature (that entails privileges but no obligations) in an intellectual and emotional evolutive process that extends consciousness, affection, respect and mechanisms of cooperation with the non-human world. Although a land ethic does not suggest avoiding the alteration, use and management of the land’s resources, “it does affirm their right to continued existence” (1987, p. 174). Therefore, he prescribes that “a thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise” (1987, p. 189).

Consequently, different interpretations of ecological justice⁸¹ materialised from these different ethical positions. In general terms, ecological justice is concerned with the expansion of the realm of justice towards the non-human world, both sentient and non-sentient. Differences in perspectives are anchored in two main

⁸⁰ Such is the case of Arne Naess’s “deep ecology” (1973), Rolston III’s view on the objective intrinsic value of individual living beings and ecosystems (1988) and Callicott’s claim about the moral worth of ecosystems as an evolutive expansion of the moral considerability community (1979).

⁸¹ Some scholars also refer to it as interspecies justice (Kopnina & Washington, 2020; Wienhues, 2020).

discussions: who are the recipients and what are the contents of justice (Kortetmäki, 2017). Scholars aligned with biocentrism claim that ecological justice is primarily about addressing the unjust distribution of environmental “bads” caused by human overconsumption of resources and habitats, affecting non-humans’ wellbeing and survival. For example, Baxter (2005) argues that living organisms that contribute to the production of environmental benefits are entitled to their fair share of the environmental resources they need to survive and flourish. However, non-living entities (e.g., mountains, rivers, etc.) are “clearly not the appropriate recipients of any kind of justice, for they have no interests” (2005, p. 84). Similarly, Wienhues (2020) proposes a theory of biocentric distributive ecological justice (or biological conservation justice) that extends moral considerability to wild beings (entities that can have a wellbeing). In her view, distributive justice is the most important dimension in a theory of justice to nature “due to the materiality of environmental problems” and the scarcity of ecological space (2020, p. 11).

Ecocentric perspectives of ecological justice also include ecosystems, species, and even the planet, as subjects of justice and emphasise other types of justice over distribution, such as recognition, capabilities, process, and participation. According to Schlosberg (2007), framing justice only in distributive (liberal and individualistic) terms is not enough to do justice to nature; recognitional and capabilities approaches could be more useful to that aim. Recognitional accounts of justice⁸² to non-humans provide two ways of justifying such an extensionist approach: the appreciation of the *similarities* or commonalities between humans and non-humans instead of what makes us unique and demonstrating the *status of injury* based on acts of denigration, disrespect, and oppression of nature

⁸² Recognition justice is usually framed in terms of granting rights to excluded groups (Dobson, 2014). In the past two decades, a few nations have advanced the recognition of the rights of nature: Ecuador and Bolivia have enshrined the rights of all nature – Mother Earth or Pachamama –in their respective Constitutions, New Zealand has granted rights of personhood to ecosystems such as the Whanganui River and Te Urewera National Park and appointed representatives to advocate and defend their rights, India attributed personhood to rivers Ganges and Yamuna (Kauffman & Martin, 2018; Tanasescu, 2017).

(Schlosberg, 2007). Schlosberg (2007, 2012, 2014) introduces the capabilities framework (Nussbaum, 2006; Sen, 2001) as an alternative approach to achieving recognition for non-humans. Capabilities refer to the real opportunities and freedoms entities – both humans and non-humans – have for achieving what is necessary for their functionings (the “doings and beings”). In other words, “a capabilities approach sees injustice in conditions that limit the basic capabilities of life – the things necessary to be the kind of being one strives to be” (Schlosberg, 2012, pp. 80–81).

A capability approach to ecological justice is concerned with securing the integrity of all forms of life by satisfying the needs that enable their functionings. Identifying such capabilities in non-human nature is possible through what Martha Nussbaum has defined as “sympathetic imagining” as well as ecological science (2012, p. 154). Schlosberg’s capabilities framework conciliates human and non-human justice by determining that harm and injustice occur when any functioning life is interrupted. However, the problem with expanding justice to nature is that, as Kortematki (2017) explains, “the more we have duties to nature, the higher is the risk of conflicts between our different duties of justice”. However, as Schlosberg (2014) argued, conflicts between justice subjects are inevitable; thus, the purpose is not to eliminate them but to identify and minimise injustices to nature⁸³. As he claims, the rationale behind his framework is to demonstrate that “conflicts can still be governed by a sense of justice that takes into consideration the dignity, integrity, and functionings of each party” (2014, p. 83).

Having navigated different ethical approaches about who could be part of the justice community and what the contents of justice should be, an ecocentric approach to ecological justice appears most appropriate for claiming justice for soils – considered as ecosystems and not bounded individuals (Celermajer &

⁸³ In this vein, Plumwood (1999) argues that extending justice to non-humans is a complex terrain, and therefore “we need to recognize multiple overlapping spheres of justice, rather than attempting to map on to the non-human sphere a single human-based concept of justice”. Moreover, she claims that conflicts amongst different spheres of justice shouldn’t be portrayed as necessarily competitive (as it tends to be the case with environmental and ecological justice) but rather finds complementarity.

O'Brien, 2020). Recognition and capabilities are two fundamental dimensions of justice for soils and put them on the agenda: the former by foregrounding the injustice caused by misrecognition through overexploitation and disrespect, and the latter by focusing on soil necessities to sustain their functionality and integrity. Furthermore, the capabilities framework applied to soils could be informed by the soil health concept, which focuses on “the continued capacity of soils to perform multiple functions (i.e., multifunctionality) and sustain plants, animals, and humans” (Bardgett & Van Wensem, 2021). Injustices to soils from such a perspective occur when their functions and processes are interrupted (e.g., biomass production, carbon storage, biodiversity pool); thus, their integrity and vitality are put at risk. To address the justice dimension of the PoFF, I will use ecological justice as a critical lens to explore soils framings in current policy developments in Uruguay through three categories inspired by the capabilities approach to ecological justice: responsibility, recognition, and representation. By responsibility, I refer to the acknowledgement of damages and who is held accountable for repairing the harm caused, and what obligations are determined towards preserving capabilities and functionings. Recognition entails identifying what specific aspects of the human-soils relationship are considered valuable and worth protection status. Finally, representation refers to identifying who speaks on behalf of soils and what claims are made about the appropriate procedures to protect soils. By looking into the assignment of responsibilities, the recognition of soils as a subject of justice and the forms of representation, we can identify what kind of soil ethics and justice underpin soils policies in Uruguay.

7.2 Uruguayan soils: past and current trends

Uruguay is a small country located in the southern corner of South America, with a population of 3.5 million and a total land area of 176,215 km², mainly covered with natural grasslands (65 per cent) and natural shrubs forest (10 per cent) aboveground and high heterogeneity of soil types belowground (Pérez Bidegain et al., 2018). Uruguayan soils are generally characterised by their good fertility despite

low phosphorus availability and limited water holding capacity (Garaycochea et al., 2020). Since the introduction of cattle in the 17th century by the European settlers, extensive livestock grazing on natural pastures has been the main agrarian activity (i.e., beef and dairy cattle and sheep), constituting the basis of the strongly export-oriented Uruguayan economy, as well as the major driver of land-use change (Berretta et al., 2000; García Préchac et al., 2004; Modernel et al., 2016). Crop farming, which has been historically a marginal activity practised in small plots to satisfy domestic demands, reached a peak of 1.6 million hectares by the 1950s, but since the 1960s and until 2000, the area waned significantly due to the low profitability of cereals (Achkar et al., 2011; Baraibar, 2020; Pérez Bidegain et al., 2018).

In Latin America, Uruguay, along with Argentina and Brazil, present the highest rates of land-use change in recent decades due to the substitution of grasslands for agricultural crops and afforestation (Baeza, 2016). Rising international prices of commodities such as soybean, wood pulp and beef since the onset of the 21st century have altered the productive trends and soil-use patterns in Uruguay (Baraibar, 2020). The most dramatic change in soils use, both in terms of scope and pace, occurred in agriculture: the cropland area grew more than five times, rising from 298 thousand hectares in 2000 to 1.6 million hectares in 2015 (Arbeletche, 2020; Baraibar, 2020; Castaño-Sánchez et al., 2021). Agriculture expanded to the detriment of natural grasslands – which decreased by 5 per cent (from 70 to 65 per cent) – because other ecosystems, such as natural forests, are legally protected (Brazeiro et al., 2020). Against this background, the most striking transformation occurred with soybean production, which scaled “from almost nothing to the number one crop in less than a decade” (Baraibar, 2020, p. 11), replacing wheat as the dominant crop (Redo et al., 2012). More specifically, the soybean cropland area went from less than 10 thousand hectares before 2000 to 1.3 million hectares in 2014 (Arbeletche, 2020). Furthermore, soybean production, which is almost entirely destined for international markets, rendered Uruguay one of the six major global exporters (Darré et al., 2019; Redo et al., 2012). The high international prices of soybeans, coupled with the absence of export taxes and

lower land values, attracted foreign investors (particularly Argentines escaping their domestic tax regime), leading to a process of concentration and foreignisation of land ownership and intensification of cropland farming (Baraibar, 2020; Piñeiro, 2012). Furthermore, the process of intensification⁸⁴ was facilitated by the introduction of new technologies such as Roundup Ready soybeans and no-tillage (Arbeletche & Gutiérrez, 2010; Borsani et al., 2010). Consequently, the cultivation of soybeans genetically modified and resistant to herbicides such as glyphosate has become the main force of soil change in contemporary Uruguay⁸⁵ (Modernel et al., 2016).

The environmental consequences of the intensification of agricultural production with the expansion of soybean monocultures, continuous cropping and intensive use of fertilisers entailed accelerated soil erosion⁸⁶, loss of organic carbon, waterways pollution and biodiversity loss (Baraibar, 2020; Pérez Bidegain et al., 2010; Perez Rocha, 2020). Therefore, the high frequency of soybean cropping in Uruguayan agricultural systems became a concern about the sustainability of the soils (Sawchik et al., 2012). In addition, the presence of big foreign firms in the agricultural sector posed the risk of transferring soil management decisions to offshore corporate interests (García Préchac et al., 2010). Contrary to previous experiences in which cropland expansion over livestock land was planned by the Uruguayan Government based on economic and social objectives, the soybean expansion resulted from the advancement of (mostly financial) capital, and thus, it was based on market values and not on an intentional public policy (Arbeletche & Gutiérrez, 2010; Baraibar, 2020). It should be noted that the fall in international prices has led to a reversion of cropland areas into pasturelands – in 2017/18,

⁸⁴ The traditional agricultural rotation systems with pasture that prevailed until the 2000s were progressively displaced with continuous farming systems, which accounted for 47 per cent of the cropping area in 2006 (Baeza & Paruelo, 2020).

⁸⁵ The second driver of land change is the commercial forestry sector, which has been promoted with political and economic incentives (e.g., the Afforestation Promotion Law, 1987) that led to the establishment of a cellulose industrial complex in Uruguay during the first decade of the 2000s. In total, the expansion of cropping and exotic forest plantations (i.e., Eucalyptus and Pinus) account for 93 per cent of land-change transformation in Uruguay (Brazeiro et al., 2020).

⁸⁶ Despite the large adoption of no-tillage (more than 90 per cent of croplands in 2013), continuous cropping with more than one crop per year accelerated erosion rates (Paolino, 2013).

soybean and wheat areas reduced by 28 per cent and 50 per cent, respectively, from their peaks (Freeman et al., 2021).

The turn of the century was also signalled by significant political changes in Uruguay: in the year 2005, the leftist coalition (Frente Amplio, founded in 1971) won for the first time in history the presidential elections, disrupting a long history of conservative governments since independence from the Spanish crown in 1830. The election manifested public discontent following the deep economic crises of 2001-2002 and the rejection of neoliberal economic policies established in the 1980s (Oyhantçabal, 2019; Potiara, 2013). The coalition that would remain in government for the next fifteen years introduced important reforms by adopting a more active regulatory role in the economy, enacting tax reforms, promoting a progressive social agenda that advanced third-generation rights (e.g., marriage equality, decriminalisation of abortion and recognition of reproductive rights, legalisation of cannabis), and reduction of inequality (Piñeiro & Cardeillac, 2017). These social and economic reforms were enabled by an extraordinary context of continuous economic growth due to the rising prices of agricultural products, increased cropland prices, and transnational capital flows (Oyhantçabal, 2019).

The environmental agenda was also amplified with new policies, regulations and plans that dealt with some of the most pressing environmental problems, including the emission of greenhouse gases by livestock, soil erosion and degradation and the loss of biodiversity associated with agriculture (Lanzilotta, 2015). Overall, in the past two decades, the country has made significant progress in the environmental sector by implementing a plethora of instruments in diverse areas (climate change, water, soils, biodiversity, energy) to protect and conserve the environment⁸⁷ (Perez Rocha, 2020). The main public response to the damaging

⁸⁷ The National Environmental Plan for Sustainable Development (MVOTMA & SNA, 2019, p. 30) is the overarching environmental policy that coordinates all environmental instruments (e.g., National Climate Change Policy, National Water Plan, National Biodiversity Strategy, SUMP and energy policy), and actors to achieve four objectives: 1) Create a commitment that guarantees the protection of the environment and equitable access to environmental goods and services for current and future generations, with emphasis on the most vulnerable population. 2) Generate a relationship with the environment based on respect for nature, which conserves biodiversity and ensures the resilience of environmental systems. 3) Actively promote the development of

effects of agricultural intensification, monocropping and the increasing use of agrochemicals is the Soil Use and Management Plans (SUMPS) for croplands. These SUMPS have been mandatory since 2013. With this policy, the government has the authority to control how crop producers manage their lands, ensuring that erosion levels are contained under a stipulated tolerance level (Baraibar, 2020, p. 357). The plans are monitored using satellite data that contrast images with the submitted plans (Zurbriggen et al., 2020). The soil governance space has been strengthened with other policies such as the National Adaptation Plan to Climate Variability and Change for the Agricultural Sector (NAP-Agro, 2019), the Agroecology Law (2018), the National Biodiversity Strategy (2016-2020), and the Native Forest Strategy (2018). Furthermore, since 2016 the government has been working on a Land Degradation Neutrality Program to set national goals aligned with SDG 15 (Life on Land).

Overall, the country experienced a period of politicisation of the environment that involved the amplification of the environmental agenda as well as increasing conflicts with environmental organisations that demand more profound changes questioning the extractivist model that has historically characterised the Uruguayan productive model and economic base.

7.3 What justice for soils?

To explore notions of soils values and justice in the recent soil policy developments in Uruguay, I conducted ten in-depth semi-structured interviews with public officials directly involved in designing the SUMPS (5) and experts from different disciplinary fields (agronomy, biology, and environmental sciences) with experience in the science-policy nexus (5). Interviews were conducted in Spanish, and I later translated them into English. In addition, to allow triangulation of information obtained from the interviews, I analysed selected policy documents,

environmentally sustainable production and consumption models and practices and incorporate the environmental dimension into current and future socioeconomic activities. 4) Strengthen, consolidate and articulate institutional and citizen capacities to manage and protect environmental systems.

official reports and news media outputs. The policy documents I reviewed included: • the Soils Use and Management Plans policy (2013), • the Agroecology Law (2018), • the National Environmental Plan for Sustainable Development (2018), • the National Adaptation Plan to Climate Variability and Change for the Agricultural Sector (2019). Other official reports were also integrated into the analysis, such as the first national state of the environment report (Ministry of the Environment of Uruguay, 2020).

7.3.1 From predatory to sensible extractivism: taking responsibility for soils restoration

Responsibility for preserving ecosystems' capabilities and functionings entails a moral standpoint, acknowledging human damages or degradation that have interrupted their becoming (Celermajer & O'Brien, 2020) and the allocation of duties of restoration and stewardship to agents who contribute to the processes that produce said injustices (Young, 2010). Responsibility for justice has, as the American philosopher Iris Marion Young (2010) argued, two interconnected dimensions: a retrospective one based on the *liability model* that assigns responsibility to those agents whose actions are causally connected to processes that produce harmful outcomes and a forward-looking one based on a *social connection model* in which agents cooperatively assume responsibility for transforming the conditions that create injustices. Therefore, responsibilities in building just social-ecological relationships should foster horizontal and vertical accountabilities (Scoones & Stirling, 2020). These notions of responsibility towards the non-human world require as Celermajer and O'Brien (2020, p. 505) argue, that we denaturalise degradation processes that fail to recognise human responsibility (and instead are seen as the result of natural accidents or fate) and demonstrate that processes such as soil erosion "are outcomes of broken-down relations".

Historically, the leading cause of soil degradation in Uruguay has been water erosion, but during the 20th century, overgrazing and continuous cropping with conventional tillage in wheat cultivation (the main agricultural soil use system)

accelerated soil loss processes (GEOUruguay, 2008; Pérez Bidegain et al., 2018). As a result, it was estimated that by the mid-1960s, thirty per cent of the territory was experiencing some level of degradation (Pérez Bidegain et al., 2018). Since the 1960s, crop-pasture rotations (with seeded grass and legume pastures) have become predominant in Uruguay, reducing soil erosion rates (compared to continuous cropping) and maintaining an adequate level of soil health in terms of organic matter content and physical properties (García Préchac et al., 2004). Furthermore, the crop area started to reduce since the activity became less profitable than in previous years due to the removal of state subsidies to agriculture and domestic targets of cereal production sufficiency⁸⁸ (Baraibar, 2020, p. 90). Overall, as a policymaker pointed out, by the turn of the century, human-induced soil degradation was not a relevant policy problem for three reasons:

“First, because the area of crops was limited to no more than half a million hectares, mainly wheat and winter crops, and very little summer crops, some second-class sunflowers, a little of corn and sorghum, and that was it. Second, the vast majority were in rotation with pastures, for which half the time was in pastures and, thus, there were no major problems. And third, at the beginning of the 90s, direct sowing was expanding, which combined with crop and pasture rotations were showing similar erosion rates to that of natural pastures, so the problem was basically solved” [PO5].

Furthermore, soils health also benefited from the integration of crop and livestock production, a system that creates synergies between multiple agroecosystem components without requiring increases in inputs (Bansal et al., 2022). As the participant observed, “during the 1980s, an integrated crop-livestock system with crop-pasture rotation was developed, which achieved satisfactory soil

⁸⁸ As Baraibar (2020) explains, between the 1940s and the 1960s, Uruguayan governments invested in agrarian infrastructure (from roads to research) under the model of import substitution industrialisation, which led to the expansion of crop areas and increment in agricultural outputs, but once protectionist measures were lifted, the sector lost competitiveness.

conservation by preserving the content of organic matter and keeping the soil covered by perennial pastures 50 per cent of the time” [PO5]. However, the profound changes in agricultural production systems since the 2000s interrupted these balanced uses of agricultural soils. The rapid soybean expansion raised early concerns amongst experts who identified that “a whole host of things were leading to have a major erosion problem in the country”, as one of them expressed [PO4].

Three significant transformations were igniting such concerns. First, in the context of intensification, crop-pasture rotations, which had proven to reduce erosion risks (García Préchac et al., 2004), were being abandoned for continuous cropping driven by the international demand (Pérez Bidegain et al., 2018). Thus, despite still practising no-tillage techniques, soils used for continuous cultivation of soybean were prone to erosion due to the poor quality of its residues to nurture and protect them during winter and from the climatic events that affect the region, particularly recurrent intensive rainfalls (GEOUruguay, 2008; Pérez Bidegain et al., 2010). As an interviewee said,

“Problems started to appear, for example, they [foreign investors] did not want animal production, only agriculture to be able to move the machines [...] Also in Argentina, especially to the west, it doesn’t rain in winter, and therefore there is no room for winter crops and winter cover but leaving a soybean stubble here is like leaving the soil naked because it disappears in two seconds with the carbon-nitrogen ratio of decomposition that it has. In other words, everyone was aware that there was a problem” [PO6].

In addition, erosion through runoff means not only a loss of soils’ organic matter and nutrients but also the contamination of surface waters from the excessive use of agrochemicals (phosphorus and nitrogen) in cultivations, which result in eutrophication processes and cyanobacteria bloom – a problem that has been affecting Uruguay’s principal freshwater sources in the past decade (Alcántara et al., 2022; Ministry of the Environment of Uruguay, 2020).

Second, the agricultural frontier was expanding not only in terms of the inclusion of new crops but also in the use of soils that traditionally were not

assigned to agriculture due to their low yield capacity and high risks of erosion (Bordoli et al., 2012; Hill & Clérico, 2013). However, soybean record prices and the increasing demand for land from foreign investors were incentives to exploit even less productive (marginal) soils⁸⁹. As a policymaker explained, “when the price of a crop is extremely favourable as it happened with soybean, even though it is planted in marginal soils, the business is still profitable to the producer because the price compensates for the lower yield” [PO4]. Consequently, the new model of agriculture that was being implemented was ridden by profitability, “for which it appropriated the balance of fertility generated in the previous phase of pastures, without any concern for preserving the soil” [PO6].

The third source of concern emerged from a new organisational model introduced through big firms of transnational capital that promoted, as an interviewee stated, “an easily removable structure for when the business ceased to be profitable” [PO5]. As mentioned previously, the lower prices of agricultural land in Uruguay compared to other countries of the region (and particularly Argentina) and the lower export prices⁹⁰ (Redo et al., 2012) rendered Uruguay an attractive place to invest in agribusiness. As Baraibar (2020, p. 8) argues, during the agricultural boom, a new type of farming unit emerged called “pools de siembra” or network firms, which are capital and technology-intensive, and operate by sharing the costs of investing and distributing the profits amongst the shareholders. Explaining how these companies function, an expert said,

“Those ‘pool de siembra’, which are large holding companies, were characterised by two things: first, not buying land but leasing it, and second, not buying machinery but hiring services, which gave us the idea

⁸⁹ The price of land went from an average of US\$ 450 per hectare in 2000 to US\$ 2500 per hectare in 2010 (Piñeiro, 2012).

⁹⁰ As Redo et al. (2012) argue, following the economic crisis of 2002/03, Argentina implemented a tax system for agricultural exports to assist in the country’s financial recovery. Taxes progressively increased from 20% to 35% between 2003 and 2008. In 2008 President Cristina Kirchner raised tariffs from 35% to 44% (depending on the variability of international prices) as an economic measure to control inflation and redistribute wealth from the commodity boom. However, export taxes can be reduced from 25% to 10-20% in Uruguay with allowable deductions (Redo et al., 2012).

that these guys were ready to take flight at any moment. They don't have to undo fixed, complicated assets that can be depreciated. It is surely the safest investment" [PO5].

It is estimated that during the first decade of the 2000s, almost fifty per cent of the total agricultural land was exploited under leases; the majority were short-term (1 to 3 years) (Piñeiro, 2012). Furthermore, these network firms concentrated on prime agricultural lands and displaced local producers (mainly family farmers), developing aggressive and competitive strategies (Arbeletche, 2020). Hence, the rationale of this new agribusiness model raised alarms in the scientific community and the government since investors could exploit soils during cropping seasons without any duties of care or liability for soils health.

Overall, as Zurbriggen et al. (2020, p. 55) explain, this sudden expansion in agricultural and soybean cropping areas was enabled by a context of liberalisation and deregulation reforms that started in the 1990s following the Washington consensus that included, amongst others, the approval of genetically modified soybean seeds; the deregulation of land leasing contracts to stimulate short-term leases; the creation of free trade zones; the passing of the Investment and Promotion Law in 1996 to encourage all sorts of foreign investments, and the removal of legal obstacles in agribusiness. Therefore, Uruguay provided the conditions for implementing a model of agricultural intensification with a clear export profile – in the case of soybeans, almost 95 per cent of the production is exported as grain (Gazzano et al., 2019). Svampa (2015, p. 65) argues that in the 21st century, Latin America moved from the Washington consensus (based on the valorisation of the financial sector) to the “commodities consensus”, based on the large-scale exportation of raw materials (including agricultural products) with an orientation to extractive or rent-based activities, with little or no added value. According to Gudynas (2016a), in South America, the wave of new left or progressive⁹¹ governments that removed conservative parties from power during

⁹¹ Most of these governments (in Argentina, Bolivia, Brazil, Ecuador, Uruguay and Venezuela) self-referred as progressive, a label that, as Gudynas (2016a, p. 104) claims, “helps to differentiate them

the first decade of the 2000s defended (neo) extractivist models of development⁹² as the basis for economic growth and to fund diverse social programs, particularly for the most vulnerable sectors of the population. As he claims (2016a, p. 104), South American progressive governments “rejected the idea that development is just a by-product of market capitalism, arguing instead that it is a process unto itself, which should be oriented towards improving people’s quality of life and reducing poverty, and that the state should have an important role in this process”. The difference with traditional extractivism is that progressive governments attributed the state a fundamental role in steering the development process to promote distributive economic justice, which gave them legitimacy and electoral support at the expense of the intense appropriation of nature (Gudynas, 2016b).

It could be argued then that during the first decade of the 2000s, a (neo) extractivist developmentalist model based on the intensification of agriculture to supply agricultural commodities to international markets was instituted in the country as “indispensable ‘engines’ of development” (Gudynas, 2016b). Furthermore, by benefiting from the neoliberal instruments created during the 90s, a “predatory type of extractivism” (Gudynas, 2016b) more aggressive with the environment with the advancement of soybean monocultures was enabled through agribusiness exploitations that intensified extraction of nutrients and organic matter from soils and led to degradation processes (Gazzano et al., 2019). Consequently, the expansion of the agricultural frontier jeopardised Uruguay’s natural grasslands, one of the richest biomes of this type in the world (Baeza, 2016; Garaycochea et al., 2020). It is estimated that between 2000 and 2015, 26 per cent of soils were degraded (Ministry of the Environment of Uruguay, 2020), and about 13.8 per cent of natural grasslands were lost (Perez Rocha, 2020).

from their origins in the traditional left”. In general, they opposed the Washington Consensus, gave a more substantial role to the state in economic and development affairs, and promoted resource nationalism and strong discourses of social justice and poverty reduction (Gudynas, 2016b).

⁹² Models of neodevelopmentalist extractivism are based on a particular form of natural resource appropriation characterised by the high environmental effects of the extraction (e.g., ecotoxicity, use of pollutants) and the prevalence of external markets (Gudynas, 2018). However, not all agricultural activities are associated with extractivism (e.g., family agriculture); only those organised for exports instead of local consumption (Artacker et al., 2020).

However, in 2008 the government approved a decree that regulated the Soil and Water Use and Conservation Law of 1981, determining, among other things, that the Ministry of Livestock, Agriculture and Fisheries (MGAP) could demand the presentation of plans for the responsible use and management of the soil, and compelled agricultural landholders (whatever the legal relationship with the property) to follow the management techniques indicated by the Ministry depending on the characteristics of the soils – natural properties and capacity – in their establishments (Hill & Clérici, 2013). In addition, in 2009 another decree dictated that in case of non-compliance, sanctions would be applied to the owner of the property in conjunction with the tenant in case of leases. The government, in close dialogue with scientists, was being alerted to the risks of degradation due to the changes in agriculture. As an expert explained, by the end of the 2000s, “The government came out to ask what the research institutes were doing regarding soil erosion problems. And actually, since the end of the 70s, in the 80s, we started research to validate and calibrate the erosion estimation model of the Universal Soil Loss Equation (USLE/RUSLE) for Uruguay” [PO4].

Thus, by 2010 the Uruguayan Government started a pilot program building upon decades of agronomic research⁹³ with a small group of voluntary farmers that would result in the mandatory Soils Use and Management Plans (SUMP) since 2013. The policy obliges producers to organise their production, establish crop and pasture rotations to preserve, restore or increase soil organic matter, and adjust to the tolerable levels of soil erosion on their farms based on the USLE/RUSLE equation (Pérez Bidegain et al., 2018; Zurbriggen et al., 2020). The plans were implemented gradually, starting with areas of at least 100 hectares for soybean crops, and in 2018 incorporated smaller areas (>50 hectares) and other production

⁹³ In the 1960s, under the work of the National Commission for the Agronomic Investigation (CONEAT) a map of the average productive capacity of soils (for beef and wool) within a parcel of land was developed (Baraibar, 2020). As Baraibar (2020) states, as a result of this mapping, the CONEAT Index was created for tax purposes to incentivise productivity and penalise speculative uses. It should be noted that until recently, the SUMP used the CONEAT map, which, although recognised by researchers as not appropriate to plan soil uses at the farm level, was the only available cartography (Hill & Clérici, 2013). However, in 2021 the government launched a new soil cartography with a scale of 1:40,000.

systems (all types of crops and dairy production). Plans are prepared by accredited agronomists and presented online using the free software Erosion 6.0 developed by researchers at the Faculty of Agronomy (based on the USLE/RUSLE equation) and are monitored via satellite (Zurbruggen et al., 2020). Basically, controls entail three stages: check that a plan has been submitted (for example, satellite images can help identify areas where there is agriculture but no plan), that there is compliance according to what has been declared, and the technical quality of the plan. As an expert pointed out, the policy was “revolutionary” because by using satellite imagery “today, we have the capacity to know what crops are being grown and if there is a crop that is not declared in the plan, or if the plan says that it was going to put up terraces and you don’t see them, then, you can send an inspection to the property” [Exp12].

To interviewees, the policy’s success is reflected in the high level of compliance despite, as a policymaker said, that “there was no carrot for making the SUMP; it was a policy that was implemented without any type of subsidy” [PO5]. Similarly, another one said, “what is most striking is its level of compliance when there are no subsidies behind it, is all a cost for the producer, because in general, in other places these land policies are always associated with a subsidy”. In 2019, approximately 96 per cent of agricultural soils (17,842 plans) were under soil conservation plans, and it was identified that only 10 per cent of the submitted plans did not comply with what was declared (MGAP, 2019). To policymakers and experts, a critical factor in the acceptance of this policy was the experimental process or the “collective construction”, as one of them expressed [PO4], that allowed producers to familiarise themselves with the tool instead of implementing the “stick all of a sudden because people would have interpreted that the only thing the government wanted was to collect fines” as another interviewee said [PO5]. Penalties vary between \$300 USD and U\$S \$300,000 USD depending on the infringement’s gravity (Pérez Bidegain et al., 2018). Regarding compliance, a policymaker observed that,

“At the beginning of the implementation, the high compliance was explained because it began by forcing those who planted above 100 hectares, covering most of the grain agriculture. So, we were controlling capitalist companies, not small producers or subsistence farmers. I think that helped because these companies also plant in Brazil, Argentina and Paraguay, and a stain in one place is a bad name everywhere. Then, there was a hugely positive response” [PO6].

Moreover, companies also saw the plans positively because they served to order land prices that rocketed after the commodities boom, and the market was not differentiating between prime and marginal lands. As an expert said, “they quickly visualised that the land market was going to be adjusted because it became clear which lands can be used more, and which ones less, and that not every soil is the same or can be treated in the same way. Then, agricultural land was ordered” [PO4].

In synthesis, the government, with the support of the scientific community and local producers that were following the soybean intensification process with growing concern, enacted a soil conservation policy that put an end to the predatory extractivist agricultural process that started in the 2000s. As the interviewed experts and policymakers concur, by the end of the decade, there was a “social agreement” that something must be done and that the best system to protect soils “was crop rotations and soil cover throughout the year”. Hence, the country went from predatory to sensible extractivism, following Gudynas’ (2011) typology of an alternative pathway to this form of developmentalism. In his view, sensible extractivism is an intermediate stage between predatory and indispensable extractivism – the final stage towards post-extractivist societies based on economic “degrowth” in which only necessary and genuine activities of the sort are undertaken. Sensible extractivism implies that “extractivist enterprises truly comply with each country’s social and environmental standards, under effective and rigorous controls, and their impacts are internalised” (Gudynas, 2011, p. 392). Furthermore, it entails implementing the best available practices for caring

for the environment and natural resources, and the export orientation is drastically reduced. Under sensible extractivism, the state recovers its role in controlling and supervising as well as guiding the productive sector.

Finally, it should be noted that while the SUMP's are built upon the liability model that assigns responsibilities to agents that caused damages, seeking to restore and manage the risks of erosion, the recent approval of the Agroecology Law in 2018 could introduce a transformative change towards a social connection model of responsibility in which all citizens could take an active part in the protection of agroecological systems of which soil ecosystems are, obviously, a critical component. As the law states, it is:

“Of general interest, the promotion and development of systems for the production, distribution and consumption of agroecological-based products, both in their natural state and processed, to strengthen food sovereignty and security, and contribute to caring for the environment, to generate benefits that improve the quality of life of the inhabitants of the Republic”.

According to Gliessman and Rosemeyer (2010), the goal of agroecological production is to transform the food system from the soil to the table. In doing so, the National Agroecological Plan aims to strengthen local food systems and supply domestic demand with products that are produced sustainably, protecting ecosystems and biodiversity (PNA, 2020). Moreover, it aims to promote the interaction between producers and consumers, strengthening a culture of responsible consumption (PNA, 2020). From this perspective, it could be argued that agroecology is not only a science and a practice but also a political project (Altieri et al., 2017). However, since the end of the progressive cycle in Uruguay (2005-2020) and the change towards a conservative government, the implementation of this law has been under dispute between the grassroots movements that advocated for it and the new authorities. While social movements emphasise the political character of agroecology, to the government, it is a scientific strategy to produce foods with low environmental impact. Therefore, the

government assumes an ecomodernist position: it will be technological solutions, rather than institutional and social changes, that will solve the sustainability problems posed by the agri-food system (Rivera-Ferre, 2018). This debate, which is still unfolding and with outcomes yet to be realised, will likely lead to a form of “apolitical” agroecology (Holt-Giménez & Altieri, 2016) that focuses on the “light greening” of industrial agriculture (Altieri et al., 2017) without substantial transformative change in the food production system.

7.3.2 A fragmented recognition

Recognition, from an ecological justice perspective, entails acknowledging that nature has its own interests “in existing, persisting, maintaining, and regenerating their vital cycles, structures, functions and processes in evolution” (Washington et al., 2018). To overcome the problem of misrecognition towards non-humans, we must pay attention “to the systematic and relational nature of deprivation and oppression” that affects the integrity of their functionings (Celermajer et al., 2021, p. 127). Scholars of the environmental humanities and ecofeminism have pointed out that soils have been wrongfully conceived as inert matter, as lifeless raw material with no inherent worth (Celermajer & O’Brien, 2020). However, as Puig de la Bellacasa (2014) reminds us, they are the bio-infrastructure that supports terrestrial life; they host a multitude of organisms from fungi and bacteria to nematodes, earthworms, ants, and so on that make them lively and fertile (Shiva, 2016), and “the biogeochemical engine at the heart of many Earth system dynamics and processes” (Granjou & Salazar, 2019, p. 39). Or, as an interviewee put it, “the soil is a critical zone where several worlds or various flows of the Earth system converge, the place where the occult lives and that we don’t understand as much but where many of the most important threads that keep the world going are hosted there” [Exp 16]. Therefore, soils are better understood in relational terms because, as Krzywoszynska (2021, p. 2) claims, “they come into being and function as dynamic assemblages between different materials and organisms (including humans) which co-constitute one another”. Therefore, soil ecosystems deserve

recognition because they are living webs with their own telos and, at the same time, the zone of encounter of diverse life projects.

In Uruguay, soils entered the policy arena in 1981⁹⁴ with the Law of Water and Soil Use and Conservation (No. 15.239), which declared “of national interest to promote and regulate the use and conservation of soils and surface waters for agricultural and livestock purposes”. Although in the decades following its enactment, no significant changes were made in terms of soil conservation, a window of opportunity opened in 2008 that would lead to its effective implementation in 2013. According to Kingdon’s (1984) theory of public policy agenda setting (Multiple-Streams Approach), the three streams converged: soybean intensification was creating increasing concerns (*problem stream*), a scientific solution to the problem was available (*policy stream*), and scientists and government were interested in controlling both the causes of erosion and predatory extractivism (*political stream*). Therefore, soils were effectively put on the agenda, giving the state the authority “to limit the power of the property holders in the name of soil conservation and erosion prevention” (Baraibar, 2020, p. 358). In this vein, a policymaker said,

“The constitution indicates that there is a national interest in soil and water conservation for agricultural purposes. And that is above any individual right because you can’t do whatever you want in your land. It conditions private property rights according to matters of national interest. That is the guiding principle. The second important thing is that it determines that the authority is the Ministry of Livestock, Agriculture and Fisheries, which will dictate the technical norms, which can be changed when there are technological changes or, shall we say, it seems reasonable to do so” [PO5].

The policy that resulted from this legislation, the SUMP, aims to control the erosion process. Under the policy, what can be cultivated depends on soil

⁹⁴ A Soil Conservation Law was passed in 1968, but it went unenforced until reforms to it were made by technicians of the MGAP, and the new version was approved in 1981 (Pérez Bidegain et al., 2018).

properties and natural capacities. As a policymaker claimed, “*the soil rules*; what the capacity of the soil can withstand is what the producer has to do” [PO4]. However, this view has received criticism from experts that consider that focusing soil conservation efforts on controlling erosion is a reductionist view of soil sustainability. For example, an expert explained that,

“[...] conserving soils is much more than controlling erosion, and some fundamental physical and chemical aspects of its preservation are not taken into account by the SUMP (e.g., organic carbon content, nutrient balance, apparent density, the potential of nitrogen mineralisation, systematisation of farms, infiltration). The plans can also not limit the high levels of water eutrophication, which derive from phosphate fertilisation on the surface, the non-respect for natural drainage, and the absence of buffer strips. Even with erosion control, agriculture can be unsustainable if fertility and physical properties are not preserved, and pollution and eutrophication are not avoided” [Exp13].

While although not perfect, as an interviewee said, “it is a simple and practical tool that might not be very precise but is much better than nothing” [PO7]. Overall, to most participants, it is a good policy that responded timely to what could have been an erosion crisis. However, there is also a shared view that there is significant room for improvement by enhancing soils mapping, including nutrient control and improving fertiliser (organic and chemical) efficiency use, minimising runoff and percolation to preserve the biological properties of the soil, analysing organic and nitrogen contents, and so on (MVOTMA, 2019).

The SUMP is built upon a productivist ontology of the soil, influenced by the paradigm of sustainable intensification promoted by the FAO. As one interviewee claimed, “there is no doubt that more production is needed [...] if you concentrate the activity in fewer hectares, more controlled, more productive and putting limits on what can come out of there, we are being sustainable” [PO7]. The rationale behind the policy is defined by what is considered the acceptable tolerance level of erosion per hectare and year, which will be explained in the next subsection.

However, as Jorge-Smeding (2019) argues, the definition of that level of tolerance “seems to require *sine qua non* a kind of ‘environmental subsidy’ from society. This is nothing other than environmental degradation that is taken as a fact and for which the production model is not responsible: there is a transfer of environmental costs from the production model to society”. Moreover, the increase of productivity within the paradigm of sustainable intensification supposes a transformation in soil ecologies and their processes, according to which soil labour “is transformed from an activity carried out predominantly by human bodies to an activity carried out by the soil biota under human management” (Krzywoszynska, 2020, p. 228). According to Krzywoszynska (2020), this focus on soil biota can enhance soils ecology, but, in her view, it does not challenge the productivist status quo. As an expert reflecting on the concept of sustainable intensification observed,

“It is worth questioning to what extent intensification is necessary, or if what is sought to improve is the business within basically financial agriculture. Maybe we are at a stage in history where a slowdown in production and the consequent use of resources may be appropriate. In addition, it must be remembered that current agriculture is an economic activity that receives a substantial energy subsidy, which is almost never taken into account since intensification depends on a greater injection of energy. The concept of sustainability implies an idea of the future [...] Uruguay has already reached its agricultural frontier, which makes it imperative to fully conserve the soil if we want to maintain our production systems” [Exp13].

According to Arias-Maldonado (2015, p. 48), there are three different levels of protecting nature in the Anthropocene “depending on what do we exactly wish to protect and why”: 1. Protection of functions performed by ecosystems that are critical for the maintenance “of those environmental conditions that make possible human life on the planet”; 2. Protection in a genetic sense of the integrity of nature “that has not been or has just barely been influenced by human beings”; and 3. Protection of nature in a qualitative sense “irrespective of the actual amount of

human influence exerted upon them”. Considering that soils are the basis of most food production, it is not surprising that conservation actions fall within the first category. The policy is concerned with controlling erosion to protect those soils functions related to their capacity to produce food and fibre (e.g., fertility, physical support, and provision of the necessary elements for plant growth and development). However, less attention is put on protecting other soil functions and processes, such as, for example, soil biodiversity, water storage and purification, and nutrient cycling, among several others. Nevertheless, the development of new policies such as the National Adaptation Plan to Climate Variability and Change for the Agricultural Sector and the Agroecology Law indicate a preoccupation with strengthening soil governance and amplifying the protection of soils functions and processes.

In addition, the Agroecology Law could instantiate integral recognition of soils as ecosystems. The National Environmental Plan approved in 2019 claims that the country should promote “transitions from systems based on monocultures with high dependence on external inputs, towards mosaics of sustainable production systems with low greenhouse gas emissions, aimed at preserving biodiversity, maintaining ecosystem services and improving the resilience of systems” (MVOTMA, 2019, p. 106). Agroecology has the potential to overcome soils and food commodification, challenging neoliberal development by focusing on near markets, familiar production systems and organic farming (Byrne et al., 2006), and with a comprehensive view of soils as part of wholes (i.e., agroecosystems). Overall, such transitions imply moving towards agroecological production systems that protect soils ecosystems. As Vandana Shiva (2016, p. 228) claims, soils vitality can be maintained “by renewing soil fertility, rejuvenating soil microorganisms and recycling organic matter, building resilience and preserving biodiversity”. Agroecology could thus be a sign of acknowledgement, respect and esteem, and belonging to the moral community leading to qualitative protection, as remarked by Arias-Maldonado.

7.3.3 Soils representation through an equation

Representation in terms of ecological justice refers to how nature has the possibility to participate in democratic deliberative processes and the public arena (Dryzek & Niemeyer, 2008; Schlosberg, 2014). Representation in the context of this dissertation refers to identifying the representative claims that are made on behalf of soils, or more specifically, the appropriate procedures to protect soils, and who acts as “nature advocates” (Tanasescu, 2014) or “human representants” (Washington et al., 2018).

The rationale behind the soil conservation policy – i.e., the prevention of soil loss – is based on decades of agronomic research in Uruguay, starting in the 1960s with the CONEAT mapping that strengthened local soil knowledge (Pérez Bidegain et al., 2018). More specifically, between the 1980s and 2000s, experimental data were gathered in three sites – “Wischmeier” (standard runoff) plots – with the types of soils usually used for agriculture in Uruguay to adapt and validate the Universal Soil Loss Equation (USLE) and its revised version (RUSLE)⁹⁵ (García Préchac et al., 2017; Pérez Bidegain et al., 2018). The experimental research that led to the calibration of the coefficients⁹⁶ of the USLE/RUSLE equation to the local geological and topographic conditions (e.g., Clérici & García Préchac, 2001; García Préchac et al., 1998, 1999; Puentes, 1981) was the result of the joined effort of three institutions: the MGAP, the National Agrarian Research Institute of Uruguay (INIA) and the Faculty of Agronomy (Baraibar, 2020; Hill & Clérici, 2013; Ministry of the Environment of Uruguay, 2020; Pérez Bidegain et al., 2018). Consequently, this reveals the strong character of the science-policy interface in the agricultural sector that was developed throughout the decades of collaborative work between

⁹⁵ The USLE equation was developed by Wischmeier and Smith (1978) at the United States Department of Agriculture as a tool for conservation in farm planning and later extended to other soil uses (e.g., rangeland and forest land) (Renard et al., 1991). The revised version by Renard and colleagues (1991) incorporates the R factor (rainfall-runoff erosivity) into the original equation.

⁹⁶ According to the equation, the soil loss rate per unit area (A) is calculated with a series of coefficients that include the rainfall-runoff factor (R), the erosivity factor; the soil erodibility factor (K); the slope length factor (L); the slope steepness factor (S); the support practice factor (P); and the cover-management factor (C) (Clérici & García Préchac, 2001).

research institutions and the state that resulted in the development of the SUMP. In this vein, it is of critical relevance to highlight that the scientists who conducted the research mentioned above were in technical and political positions within the MGAP (Zurbriggen et al., 2020) when the policy window for soils opened by the end of the 2000s.

Therefore, the agronomic corporation, with a wealth of soil knowledge accumulated over decades of experimental research, was in a good position to “speak for soils” while also securing the resilience of the productive system. It should be noted that in Uruguay, the soil science discipline does not exist as a bachelor’s or postgraduate degree. Moreover, since only one University provides a degree in agronomy, as an interviewee stated,

“Those [agronomists] who are on the side of the government, those who are on the side of the companies that produce food, those who sell agrochemicals, they all know each other, there is a network of trust, and that is why the law was also possible because there were ties between agronomists standing on different fronts. The history of the Uruguayan soil policy comes from the same sector, and therefore it is also an interpellation of the internal sustainability of agriculture” [Exp 16].

Although agronomists have become the “representants” of soils in the policy arena, other disciplines and the community have recently challenged this role. In particular, a tense relationship has developed with the “environmental” sector of government, represented by the National Direction of Environment (DINAMA) within the Ministry of Housing, Territorial Planning and Environment (MVOTMA). Said tension emerged from DINAMA’s demands for more rigorous controls on the use of pesticides and fertilisers in agriculture. Such controls are not contemplated in the plans. According to a participant, the mission of DINAMA “is broader than the strict preservation of the soil. It is more focused on the ecological vision of the production, and they have an intense debate there [...] to someone from DINAMA, it is not only about controlling production but also about the creation of ecological corridors, restricting the use of certain fertilisers containing

phosphorus and nitrogen, and so forth [...] that is a discussion constantly taking place between DINAMA and the MGAP” [PO8]. Another interviewee said that agronomists are a “very closed corporation that is annoying to other governmental sectors and disciplines” because they do not have training in ecology and thus, “they do not understand the environmental externalities of bad practices such as fertilisation, downstream problems, etc.” [Exp15]. Several investigations (Alcántara et al., 2022; Aubriot et al., 2020; Goyenola et al., 2021) claim that recurring harmful cyanobacteria blooms in Uruguay’s main rivers and basins (e.g., in 2013, 2015, 2019) relate to the intensive use of agrochemicals – which between 2003 and 2013 increased fourfold (Gazzano et al., 2019) – to maximise crop productivity. For example, Goyenola et al. (2021, p. 12) argue that eutrophication from agriculture-induced nutrient loads into aquatic ecosystems “has become a widespread environmental problem in Uruguay, having caused large-scale negative consequences for drinking water, recreational activities and tourism, as well as for aquatic biodiversity”. These cyclical ecological crises have raised concerns not only from DINAMA but also from the tourism industry and citizens affected by the deterioration of water streams. The agronomists’ counterclaim is that the emphasis of the soil conservation plans is on erosion, and other elements, such as surface water contamination due to runoff, are beyond the current capacity of the policy as well as their bounded disciplinary knowledge. In this vein, an agronomist explained that “the SUMP should be thought of as the bottom layer, as the basis to which new dimensions related to fertilisation, the use of pesticides, biodiversity, etc., can be added, but the agronomic corporation cannot address this challenge” [Exp14].

Consequently, this conflict reveals the limitations of reducing a complex non-human to a single discipline, challenging the exclusivity of agronomists as the authoritative voice for soils. Therefore, if we acknowledge that there are different views and values in dispute regarding soils policymaking, it would be commendable, following the precepts of post-normal science (Funtowicz & Ravetz, 1993), to find ways to include a more extended community of actors who can evaluate scientific recommendations and legitimise decision making processes.

Hence, more inter- and trans-disciplinary approaches are necessary to democratise soils representation by amplifying the number of voices caring for the integrity of their web of functions and processes and the ecosystems in which they are embedded.

As repeatedly stated in this chapter, the plans are built upon the USLE/RUSLE equation. When a soil management plan is submitted to the MGAP, the owner or tenant of the land – whoever is using it for productive purposes – declares a projected farming system, on which erosion is modelled by using the equation that is encoded in the software Erosion 6.0 (Zurbriggen et al., 2020). Overall, the plan cannot exceed the level of soil loss tolerance (T value) that, according to the MGAP, is 7 tons per acre per year. The T value is one of the most controversial aspects of the equation and, consequently, of the policy. As one interviewee mentioned, the SUMP “are practically limited to estimating a soil loss that falls below an arbitrary tolerance” [Exp13]. Although the tolerance value has been defined by the process of “expert opinion” with researchers from the three institutions mentioned earlier, it is a political value. In this vein, an expert said,

“Tolerance is subjective and does not have a solid scientific basis. If I am the MGAP minister tomorrow and under pressure from the producers, I can raise the tolerance level to please producers. You must set limits, for sure, but there is no formula, and unfortunately, this subjective value is what most influences the final result of the policy. Practically the tolerance limit, that T factor that you assign to the soil, is the factor that tells you the level of protection of the soil” [Exp14].

The heavy reliance on this equation to determine the soil conservation policy mirrors the Uruguayan bureaucratic idiosyncrasy, which, as described by Zurbriggen et al. (2020, p. 56), is “predominantly rationalist with a strong belief in progress, reason and scientific planning, as opposed to policies based on interest”. Nonetheless, some interviewees claim that the policy should not be reduced to matters of “mathematical precision”, which reinforces a misconception that reality can be replaced with simulations of scientific precision. Furthermore, there is also

the risk of manipulating the equation in order to obtain the yields the producer aspires to obtain. As a participant explained,

“One of the problems is that the development of the plan can become a game of how I can make the equation serve my interests. I can manipulate the coefficients to report the accepted level of soil loss. And those are the things, the weaknesses of the system, the agronomist’s boss, the one who pays for the development of the plan, can push to make the equation let him cultivate soybean after soybean” [PO7].

However, human manipulation of this kind might be almost inevitable because, as Campbell’s Law (1976, p. 49) states, “The more any quantitative social indicator is used for social decision making, the more subject it will be to corruption pressures and the more apt it will be to distort and corrupt the social processes it is intended to monitor”. The introduction of other parameters that could enhance the policy beyond the equation would be a future path to follow for achieving more coherent protection of soil ecosystems. As an interviewee said,

“I believe the current system of the plans based on the equation should evolve and use the equation not as a primary tool but as a support tool. For example, plan soil uses based on capacity classes and then apply the equation to see if that works. I think that this could be an idea in the future to continue advancing” [Exp14].

In sum, the agronomist is, as a policymaker stated, “the one that defines what can be done and what cannot”, and soil conservation is, thus, “managed agronomically: nothing is prohibited from the start, but there has to be a technical work behind” [PO4]. The plans are, to policymakers, “an objective tool, the best one available to estimate a tolerable erosion with technical and political criteria that says, ‘we can lose this much of these soils’”. Consequently, by emphasising agronomic knowledge almost exclusively, the policy preferences the utilitarian dimensions of soils instead of their inherent value.

7.4 Conclusions

This chapter has explained how a soils policy can be interpreted from an ecological justice perspective by eliciting emergent notions of responsibility, recognition and representation from experts and policymakers' framings of the policy. The Uruguayan case reveals that the government, faced with a potential erosion crisis due to a change toward unsustainable (predatory) soil management practices, acted responsibly in limiting producers' actions and putting the national interest of protecting soil over private property rights. Although the food production system remained relatively unchallenged (despite the recent approval of an Agroecology Law), most interviewees considered the regulation successful in discouraging erosive practices by reinstating crop-pasture rotations and obliging producers not to exceed the officially accepted level of soil loss. Furthermore, the SUMP's have become internationally recognised, mainly because no subsidy was given to producers. However, the policy achieved a high level of compliance. In addition, it is considered to be aligned with the Voluntary Guidelines of Sustainable Soil Management (GSP and FAO) and with targets 2 and 14 of the UN Sustainable Development Goals (García Préchac et al., 2017; Peake & Robb, 2022).

Since the policy focuses on limiting soil loss, the recognition of soils as a subject of justice is partial. Therefore, from a capabilities approach that looks at the integrity of soil ecosystem functionings, other elements that are also pertinent to their health (e.g., agrochemical inputs controls and biodiversity conservation) are not taken into consideration. If not included, these additional components can also interrupt soils vitality. Overall, soils are represented in the policy arena by the agronomic corporation that has based the public conservation strategy on the USLE/RUSLE equation. Although weak and imperfect, it is a simple tool accessible to all producers through a free online system, Erosion 6.0. In addition, plans are monitored with satellite imagery to corroborate the effective implementation of submitted plans spatially. However, the heavy reliance on an equation that could be manipulated for for-profit purposes also shows that the policy could be

improved by incorporating other parameters (e.g., detailed mapping of soils capacity uses) that go beyond the strictly mathematical.

In sum, in the past decade, there has been an increasing concern and commitment of the Uruguayan Government to creating more regulations to protect the environment. The SUMP's coupled with the NAP and the Agroecology Law, are significant progress in terms of soils protection, governance, and awareness creation in soil conservation. The soils case reveals that their importance in policymaking is grounded on their utilitarian value for food production rather than on their intrinsic value. Addressing their intrinsic value does not mean that soils should remain untouched; of course, they are vital for human survival and for sustaining food systems, but a moral consideration suggests that we can "use" them in more ecological and caring ways and not only from a sustainable intensification perspective (for example, by adopting agroecological principles). Although justice for soils is sustained in an anthropocentric perspective, the Uruguayan soil regime has introduced a profound transformation in human-soils relationships towards more attentive and careful ways of interaction. The responsibility assumed by the state in controlling, regulating and steering conservation actions has put limits to purely rent-based over-exploitation of transnational capital. New policy developments indicate that a potential transition toward a post-extractivist model that overcomes soils commodification and promotes ecocentric values can be attained in the future based on agroecological principles of food production that challenge capitalistic industrial agriculture. Furthermore, the case shows important lessons that could be an example for other jurisdictions to reframe soil issues: first, prioritising soils as a matter of national interest that places them before private interests and property rights. Second, assuming public responsibility in leading or coordinating conservation actions and holding producers accountable for their (un)sustainable management practices. And third, foster dialogue with experts and align positions about what the problem is and how it should be addressed.

Finally, it should be noted that operationalising categories of ecological justice such as recognition and representation has been challenging because the SUMP's

policy has not been designed explicitly from this perspective, nor does it include concepts familiar with non-anthropocentric ethics. Since soils are not formally recognised in the policy from such a view but rather from a sustainable intensification one, there is no consideration of a capabilities approach that looks at soils health and the integral functionalities of the ecosystems. The Uruguayan soils policy inadvertently addresses justice issues by securing that soils are no further damaged in terms of loss or erosion so that they can sustain their productive capacity and, for that reason, as argued in this chapter, other critical components are missing. Furthermore, there seem to be no other relevant actors besides the agronomic corporation that have historically dealt with soil issues entitled to advocate or speak in the name of soils.

Chapter 8

Discussion

This chapter synthesises and discusses the empirical findings obtained by applying the PoFF to respond to the three main research questions addressed in chapters 5, 6 and 7. Based on the premise that soil degradation issues are a second-tier priority in global and local policy agendas despite growing claims for action from experts and international organisations, this research sought to provide explanations (transcending the “complex problem” attribution described in Chapter 2) for this neglect that impacts on the status of soil ecosystems. Adopting a constructivist/interpretive lens, I focused on understanding the processes through which actors at the science-policy interface construct soil degradation as a public problem that should be regarded (or not) as a matter of political decision making. Against a background of increasingly urbanised societies detached from what soils are and do, the research was circumscribed to the communities of experts and policymakers because the convergence or divergence in their framings of the problem has a critical role in creating awareness and in influencing policy choices.

Inspired by framing analysis as an interpretative method to address competing visions, causal explanations, and value judgements, I developed the PoFF as a critical tool to capture the dynamics of framings and their outcomes in terms of agenda setting and policymaking, and therefore, in their overall protection and governance. From the literature review of diverse disciplinary fields (e.g., political

and social science, political ecology, environmental humanities), three dimensions emerged as relevant to comprehending the sense-making of environmental problems: political ontology, power and justice. Consequently, I investigated how each of these dimensions operates in framing processes in two jurisdictions: New South Wales, Australia, and Uruguay and their concomitant impacts in terms of agenda setting and policy formulation. The aim was to unpack which visions of soils and human-soils relationships actors seek to sediment in reality (Chapter 5), how power is mobilised in framings to reaffirm those visions (Chapter 6), and what notions of justice are implied for guiding and justifying action (Chapter 7).

This chapter first presents the key findings of this research. The remainder of this section is dedicated to critical reflection on the PoFF. In doing so, first, I present my reflections on how the PoFF fared as a heuristic tool of analysis. This section also integrates the three dimensions that were analysed separately in the empirical chapters. The subsequent sections are dedicated to reflecting on each dimension and discussing how they articulate with the remaining two by reading the findings of Chapters 5, 6 and 7. I conclude with a brief comment about the current soil politics in both jurisdictions.

Key Findings

The key findings show that, first, framings are used at the science-policy interface as strategies of de/politicisation to legitimise policy choices that exclude or include issues into the policy agenda and contribute to shaping public perceptions about their (un)importance. Since they are purposefully mobilised to justify preferences about policy choices, they are contingent over time (as shown in Chapter 5) and across contexts (as shown in Chapters 5 and 6, dedicated to the NSW's case, and Chapter 7 focused on Uruguay's case). Furthermore, the divergence in soils framings between the community of experts and the community of policymakers reinforces depoliticising processes that exclude soils from the agenda, resulting in fragmented governance, as the NSW case indicates. However, when framings converge at the science-policy interface, re/politicisation is likely to occur if

cooperation and collaboration between the two groups take place, as the Uruguayan case demonstrates.

Second, soils' productivist political ontologies are dominant in the policy arena, but there are nuances. Although the scientific community of soil scientists and agronomists tend to share this view with policymakers, there are important differences in their interpretations of its implications. In NSW, experts have made efforts to create awareness in the public and policy domains to introduce protection schemes that look at soils in more comprehensive and ecological ways (e.g., working with concepts such as ecological services, soil security, soil health, etc.). In contrast, the government has tended to depoliticise soil issues by deregulating, and transferring responsibility for their protection to landowners whose private property rights are safeguarded. Furthermore, a productivist ontology does not necessarily equate with neoliberalism and deregulation, as the Uruguayan case shows, where a left-wing government enacted a soil policy assuming an active role in regulating soil management and discouraging predatory practices.

Third, under a neoliberal regime such as that of NSW, depoliticising strategies exclude soils from the policy agenda by framing them as a non-political issue (i.e., outside the policy agenda and responsibility of private owners) and, more recently, also as an apolitical issue (i.e., eco-technological fix in climate change mitigation). Such depoliticising framing strategies mobilise the power of the ruling elites over other groups (e.g., experts), conveying narratives that conform to their ideology and interests, reaffirming the status quo (deregulation, privatisation of extension services, absolutist private property rights regime).

And fourth, soils politicisation can be achieved when the government assumes an active role in their protection, converting them into a subject of policy, as the Uruguayan case shows. By framing soils as a matter of national interest above any particular private interest, the state could assume the leadership of conservation actions that prevent purely profit-seeking productive/extractivist soil uses and unsustainable management practices. Furthermore, a critical aspect of the politicisation process was the alignment of framings between experts and

policymakers regarding the conservation rationale. Although ecological justice issues were not addressed directly, the policy amplified the community of moral considerability by including soils in the agenda and actively working on expanding the soil governance space (i.e., Agroecology Law, National Adaptation Plan to Climate Variability and Change for the Agricultural Sector).

8.1 About the PoFF: Connecting political ontology, power and justice

The framework has proven useful to organise the analysis of framings by providing directions to critically explore differences and convergences in actors' descriptions, explanations and justifications in their interpretations of soil degradation as a public problem. After all, competing framings over the same issue exist because actors hold different preferences, interests and values (Schön & Rein, 1994). Framing theory within policy process scholarship is usually applied to explain why certain policy options about societal goals are turned into action while others are disregarded, or in other words, why certain issues move from a model of causation to a model of implementation (John, 2013; Peters, 2015). Scholars have pointed out that often, uses of frame analysis as a research method have focused on the contents of frames or the influences of frames created by media in the policy arena (Bacchi, 2009b) rather than on the framing process itself (Björnehed & Erikson, 2018; Vliegthart & Van Zoonen, 2011). However, such descriptive analysis of stable frames, although relevant, constrains the potential of frame analysis as a method of seizing the dynamic nature of framing as a process of sense-making that provides guidance for action (Björnehed & Erikson, 2018; Snow & Bedford, 2000; Van Hulst & Yanow, 2016). However, there are no clear criteria in the policy process literature about what to examine when we address the dynamics of framings through naming, selecting and storytelling, which is particularly relevant when dealing with complex environmental problems. Thus, the PoFF was developed to guide the exploration of framings with such a dynamic view, understanding that framings are contingent and embedded in the situational context of production

and reproduction in which actors with different material and symbolic resources (Vliegthart & Van Zoonen, 2011) struggle to impose their visions over a specific problem.

Therefore, instead of describing *frames of thought* or individual cognitive representations about an issue, framing analysis focuses on the interpretation of collective *situational issue framings*, which, according to the perspective I have developed in this research, are articulated through the three dimensions included in the framework. In the empirical chapters, I identified alignments in meaning co-construction between the community of experts on the one side and the community of policymakers on the other about *what it is* and *what it ought to be* regarding soils protection. The literature on framing as a dynamic process indicates that alignments result from the ongoing interaction between actors that negotiate how a situation should be understood (Dewulf et al., 2009; Dewulf & Bouwen, 2012). It should be noted that the intersubjective construction of those meanings was the result of the interpretive work of making individual interviews and written materials communicate during the analysis rather than observing direct interaction between participants. This kind of analysis produces a double hermeneutic effect according to which the researcher's context is co-implicated in the context of what is being researched, and thus they co-inform one another (Giddens, 1987; Mills et al., 2010). The PoFF helped deal with this effect by making explicit the rationale for my interpretive approach to the empirical evidence, which was structured around the three dimensions and the categories embedded in each (explained in detail in the analytical chapters).

In the case of NSW, as demonstrated in Chapters 5 and 6, the alignments between the scientific and policy communities regarding soil protection policy preferences have diverged over the past three decades. In contrast, they have recently converged in Uruguay, as Chapter 7 explains. In NSW, until the 1990s, soils were an active area of natural resource governance, but they became progressively marginalised in the policy arena with the dissolution of the Soil Conservation Service and the concurrent decline of soil experts and funding for soil conservation programs, as shown in Chapter 5. Furthermore, as demonstrated

in Chapter 6, in the struggle for meaning creation, the framings of ruling elites portraying soils as a non-political or apolitical matter have gained terrain over other visions. Consequently, these dominant framings have led to the depoliticisation of soils by excluding them from the agenda. In practical terms, this depoliticisation translates into dispersed efforts in soil protection across governmental agencies and overall fragmented governance, as diagnosed by Webb et al. (2015). The Uruguayan case explored in Chapter 7 reveals that when framings about desirable actions on a specific issue converge between the two communities, they can prompt the formation of a window of opportunity for a policy shift. Of course, a problem (or crisis) must be identifiable – as happened with the increasing erosion of soils during the 2000s. The literature indicates that timely use of a policy window (e.g., within a political cycle and not in between cycles as occurred in NSW with the policy proposal rejected in 2011), will most likely lead to a policy change. In Uruguay, the convergence of framings resulted in the introduction of soil issues into the policy agenda, and therefore, they became politicised through a process that moved them from the private de-regularised domain into the realm of public policy. From the cases analysed, it could be argued that achieving politicisation is far more challenging than depoliticisation since the former requires agreements and coalitions to be reached, while the latter is rather discretionary and one-sided, following powerful interests.

Although some scholars argue that framings can emerge in unconscious or ad hoc ways (Bacchi, 2009b; Kusmanoff, 2017), in this dissertation, I addressed framings as *strategic devices* used by actors to block or advance soils issues into the policy arena. Considering that the research focuses on two “elite” communities that are highly aware of their social and political positions, it is to be expected that nothing is unintentional or naïve in how they frame issues. From the analysis, it follows that the purposeful utilisation of framings has de/politicising effects on the issue at stake, resulting in either its marginalisation, neutralisation or exclusion from the policy domain (as happened in NSW) or in its recognition and inclusion into the policy agenda (such was the case in Uruguay). Furthermore, as demonstrated in the empirical chapters, framings are sensitive to context, and thus

an issue de/politicisation is always susceptible to being challenged and reversed. Consequently, making explicit how problem framings operate in a given context not only serves to identify where divergences and conflict lie but also provides elements to nurture reflection about how reframing toward desirable outcomes in the policy arena could occur (some suggestions will be presented in Chapter 9).

Though I thought of the framework's dimensions as essential elements to critically analyse environmental framings, their boundaries are inevitably porous. This research has explored them separately to develop a more in-depth understanding of their explanatory potential. Admittedly, although they have shown sufficient strength on their own, they are embedded in one another. In other words, although addressed independently in this research, the dimensions that were not brought forward in each empirical chapter are implicit in the analysis. As discussed in the following subsections, focusing on what is actualised in the reality of a certain issue (the political ontology) encompasses power dynamics that sustain it (or challenge it) and ethical judgements that justify policy choices. By the same token, emphasising the power dimension implies that its mobilisation is oriented toward supporting a political ontology or advocating for its change, driven by ethical considerations about what is just in social-ecological relationships. Similarly, placing the focus on justice to nature implies understanding that claims on this matter transport assumptions about what is real, which is endorsed by power dynamics that stabilise it or aim to challenge it by appealing to the alternative visions that have been excluded.

From this reflection, it follows that the examination of framings with a critical perspective entails a double movement between what is affirmed and what is omitted in the acts of naming, selecting and storytelling – that is *the political*, the metaframings that contain the alternative imaginings of possible socio-ecological orders that compete for their materialisation (Swyngedouw, 2015) despite the ultimate groundlessness (Marchart, 2007). Therefore, framing analysis based on this view can assist us in exploring political difference (see Figure 8.1) (Marchart, 2007).

In synthesis, this research has drawn on framing theory and analysis to understand how and why soil issues are selected or disregarded for effective political consideration. The premise is that framings play a critical role in the potential transformation of problems into policy problems. Therefore, they are of vital relevance for understanding processes of agenda setting because as scholars in political science have indicated, problem setting is as important or even more so than problem solving (e.g., Bacchi, 2009a; Rein & Schön, 1977; Turnbull, 2006). Through the analysis of framings, we can identify the nodes of divergence within a specific debate and, thus, usefully create new visions that could reach agreements or, at least, advance towards their achievement. In this way, the framework proposed in this research is a step forward in the comprehension of the “black box prior to agenda formation” (Stone, 1989, p. 281) by looking at problems through the prism of these three dimensions.

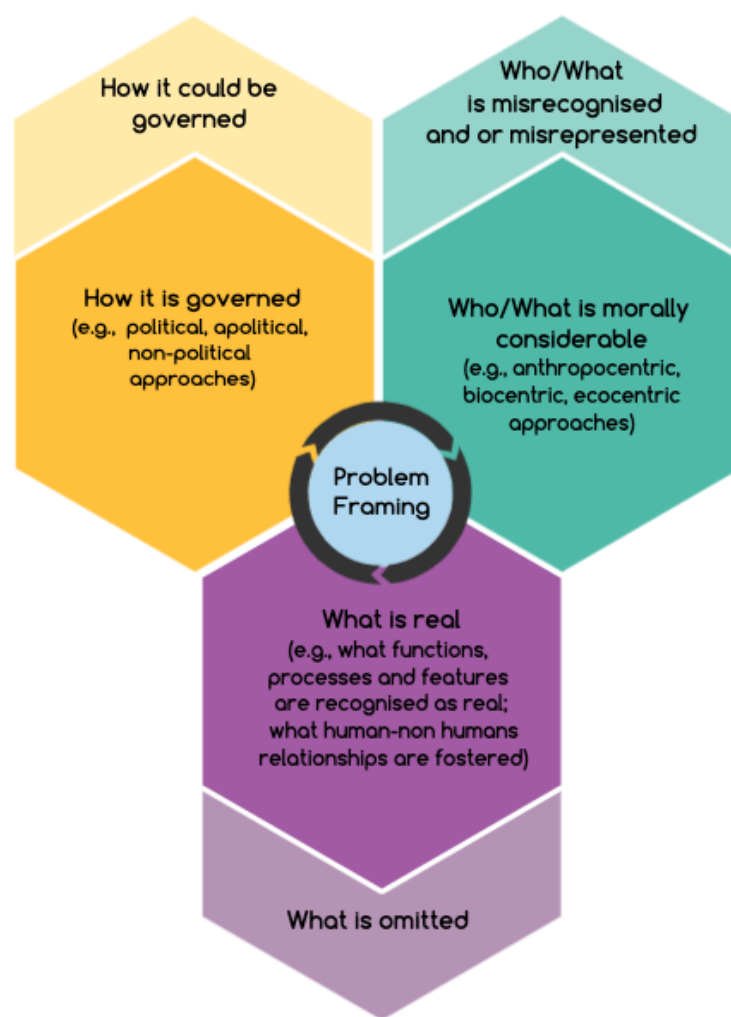


Figure 8. 1 The framework’s contribution to exploring the political difference.

However, the framework has limitations. Since framings are produced and reproduced in situational contexts of interaction, they are not confined to the purely cognitive-linguistic (as are the frames held in peoples’ minds), but they are also experiential, performed and enacted in everyday practices. Thus, framings might not always be accessible only by means of speech or reading documents. Consequently, we should be aware that the framework assembles only part of the story (Blaser, 2009) while the remaining part belongs to the practices through which “worlds are made” (Mol, 1999, 2002; Law, 2004). Furthermore, applying the three dimensions together to analyse framings can be cumbersome if dealing with several interest groups or political positions. Therefore, depending on the research

context, the framework may be inappropriate where there are various positions or groups under examination and limits to time and resources. In addition, the PoFF as an interdisciplinary tool, while enriching, is also challenging to apply when coping with complex problems that require transcension and synthesis of diverse knowledges. Accordingly, I recognise that tensions from this integration are inevitable. Such tensions, and ways to overcome them, should become more evident with further research. Therefore, applying the PoFF to other environmental framings could help identify those potential contradictions and enhance the inter-and intra-dimensional dialogue.

8.2 About soils political ontologies at the science-policy interface

Inquiring about the political ontologies in problem framing entails understanding what the actors' discourses are attempting to sediment in reality (either by reaffirming the existing order of things or seeking change). In other words, political ontology puts under question the acts of grounding (Saar, 2012) that in this dissertation have been addressed through the rhetorical devices (i.e., naming, selecting and storytelling) used by the participants interviewed to elaborate on what soils are and how we should relate to them. A certain way of framing problems may reaffirm what is being actualised in reality (e.g., soil as an exploitable natural resource for satisfying human needs such as food production), while others may seek to change it by appealing to alternative systems of ideas about the same issue (e.g., soils as an all-encompassing natural resource, soils as a technological fix for climate change mitigation, soils as living communities or entities). Conceiving ontologies as *political*, as this framework does, implies that what is regarded as real is articulated with actors' ideologies, interests and information (i.e., the power dimension of the PoFF). Furthermore, political ontologies are interconnected with moral considerations about what is just in human-soils relationships because, as has been argued by prominent scholar Maria Puig de la Bellacasa, whose work has contributed to the reflection on soils from a

social science perspective, “what soil is thought to be affects the ways in which we care for it, and vice versa” (2015, p. 692).

In Chapter 5, I analysed the trajectory of soils in NSW’s institutional context and explained how the relationships between the state and soils changed over time and how framings operated transporting those variations in political ontologies, de/politicising soils in the policy domain. This case shows that shifts in discourses have been used to support the state’s policy choices in assuming or relegating responsibility in leading conservation actions. Soils entered the institutional agenda by the end of the 1930s with the pioneering Soil Conservation Act, which sought to create awareness and limit the unsustainable management practices for growing food that had provoked many land degradation problems and processes. For a long period of time, the state had an active role in steering soil conservation until a new politico-economic context guided by neoliberal ideas removed it from such a role by the beginning of the 1990s. Under a neoliberal rationale concerned with small government, private property rights and commodification that pervaded Australian politics (Cooke & Moon, 2015; Lockie, 2013), soils became depoliticised through their progressive marginalisation from the policy arena – a condition that remains unchanged as analysed in detail in Chapter 6 by applying a power perspective. An attempt to re-politicise soils with a new policy proposal presented in 2011 shows that alternative visions to the dominant ones are latent in society and seeking opportunities to gain traction. The proposal, mainly built upon expert knowledge, considered soils beyond the strictly productive and introduced the principle of maintenance and improvement of ecosystem functions as a holistic way of managing soils and guaranteeing their health. In addition, it integrated soil with other environmental problems, such as climate change and biodiversity, uplifting their marginalised position within integrated NRM schemes. Furthermore, it proposed to return to the state the responsibility of leading soil protection in collaboration with community organisations, local governments, industry and landowners.

However, as explained in Chapter 5, a shift in the government’s political orientation led to the dismissal of the proposal. In this chapter, I argued that the

ontopolitical assumptions embedded in the proposal were incompatible with the interests that the ruling elite represented, and those contradictions were more noticeable in terms of the other two dimensions of the PoFF. In brief, two important reflections emerged. In terms of power, it is against a neoliberal ideology to assume responsibilities over a resource that is regarded as a “private asset” and not a public good. Furthermore, from a justice perspective, positioning soils as an overarching resource in NSW could have been a stretch to soil values which, to the government’s rationale, are basically circumscribed to their instrumental worth for agriculture and infrastructure (expanding urbanisation).

In the past decade, neoliberal governments in NSW have sustained soils depoliticisation, as was analysed in Chapter 6 and will be addressed in the next subsection. Although the scientific community of soil scientists and agronomists, and policymakers tend to share a productivist view on soils, there are important differences in their interpretations of its implications. In NSW, experts have been advocating for a policy change that strengthens soil governance with comprehensive management and protection frameworks. In contrast, the government has tended to depoliticise soil issues by deregulating, and transferring responsibility for their protection to landowners whose private property rights are safeguarded.

There is nothing reprehensible in productivist ontologies a priori – considering that at least 95 per cent of food comes from soils, it is reasonable to claim that this is the most important function of soils to many. However, the *consequence* of the overwhelming dominance of this vision is that it contributes to the lack of public awareness about the rest of the vital functions and processes that soils perform (e.g., biodiversity pool, water storage and purification, nutrient cycling, waste recycling, amongst many others described in Chapter 2). Soils are ecosystems in themselves, and by focusing almost exclusively on those functions related to productivity (e.g., fertility, physical support and provision of the necessary elements for plant growth and development), the rest of their contributions to sustain life remain less known and become absent in our minds – but not ontologically absent (Puig de la Bellacasa, 2014, p. 29).

Furthermore, there are nuances amongst productivist ontologies. For example, productivism grounded on maximising profitability in a de-regulated context can have devastating consequences on soils, whereas productivism monitored by a state that puts soils sustainability above particular interests can promote more careful human-soils relationships. In Chapter 7, it was explained how the boom in soybean prices led to increasing levels of soil erosion in Uruguay due to the unsustainable practices associated with this crop (e.g., monocropping, continuous cropping, intensive use of fertilisers and pesticides). Soils were only a means to obtain returns from agriculture, and since management decisions were non-regulated, producers were left to determine for themselves how to manage soils in accordance with their self-interests. However, the introduction of regulation in soil management with the passing of the SUMP's policy instantiated a new and more "sensible" way of relating with soils. Following Gudynas' model of extractivism stages discussed in Chapter 7, I argued that in moving from a predatory to a sensible form of extractivism (the prior stage to indispensable or post-extractivism – the ideal type of societal organisation in which humans only perform the genuinely necessary extractive activities), the government encouraged a more benevolent and attentive relationship with soils. In addition, the policy agenda for soils was augmented with new developments (e.g., Agroecology Law, National Adaptation Plan to Climate Variability and Change for the Agricultural Sector) that are guiding the country towards a sort of "green productivism" connected with an ecomodernist rationale entrenched in current public discourses.

Again, there is nothing wrong or mistaken about a political ontology a priori; rather, the issue is the *effects* that a particular vision of a problem has in terms of its de/politicisation. Therefore, we must ask ourselves: what that vision is excluding or omitting, could the problem be governed otherwise, and what or who is being represented or misrecognised in that view (the metaframings, shown in Fig 8.1). The fundamental notion that political ontology brings to the fore is that in any sedimented practice or discourse, there is always something missing that might be critical for creating sustainable change.

8.3 About power and soils politics

In politics, powerful actors use selecting and storytelling to manage meanings (Haugaard, 2009) about an issue and influence other actors' policy choices. Therefore, they are rhetorical devices mobilised to gain support for a cause or block it from the agenda (Saurugger, 2016; Stone, 1989). Adopting this view entails acknowledging that although path dependencies might constrain framing processes, influential groups have the capacity to steer debate and impose their visions about what they consider are the desirable social-ecological orders, according to their ideologies, interests and information, as well as their ethical commitments. Chapter 6 explains that power can be exercised in two ways, as a form of domination (i.e., power over) or as a transformative capacity (i.e., power to and power with). Power as a form of domination manifests in the depoliticisation of environmental problems either through their demotion from the policy domain, controlling what moves into the agenda, and/or controlling the narrative surrounding it. Conversely, power as transformative capacity results from the convergence of visions between individuals who share a common purpose and cooperate to re/politicise issues by raising their public profile, incorporating them into the agenda and effecting their integration into decision-making processes.

In NSW, depoliticisation has been the governing strategy of soils *par excellence* since the dissolution of the Soil Conservation Service in the 1990s. Soils went from being one of the key environmental areas to almost forgotten within the public sector in a process in which power was used to remove the issue from the public agenda and ensure its exclusion, as the failure to re-politicise it reveals. Chapter 6 examined how power operates in legitimising government policy choices that naturalise the existing order of human-soils relationships, perpetuating soil depoliticisation. Discursive power is used to transport ideologies that depict soils as a non-political (i.e., there is nothing substantially damaged that requires political intervention) and apolitical or politically neutral matter (i.e., a nature-based solution foregrounded by the Australian Government for climate mitigation; a recently emergent framing amid increasing international and domestic pressure

to adopt a clear net-zero emissions target). These strategies have been defined in the literature as preference-shaping depoliticisation, referring to “the way state managers deploy ideological or rhetorical claims to justify the placing of a particular issue or function beyond the realm of politics” (Buller et al., 2019, p. 11; Flinders & Buller, 2006).

Therefore, the dominant framings preclude the elevation of alternative problem constructions and solutions such as, for example, soil security, soil health and soil ecosystem functions. Furthermore, considering that soils contribute to capital accumulation through the provision of agricultural commodities (Engel-Di Mauro, 2014; Krzywoszynska, 2020; Salazar et al., 2020), they are submissive to the interests of the powerful agroindustry complex. According to some scholars (Botterill, 2006, 2016; Iles, 2021), in Australia, the sector’s strong influence over policies, values, and preferences has been successful in displacing conflict and preventing the emergence of issues that could challenge the status quo. In addition, they are compliant with an absolutist private property regime (Reeve, 2001) that bestows full responsibility on landowners for their decisions on how to manage their properties (and, thus, the soil). This neoliberal belief in individualism and self-regulation reinforces the state’s disengagement from scrutinising management practices, removing them from political decision making (Jessop, 2014). Moreover, soil management advice provided by the government in the SCS era became privatised and influenced by commercial agroindustry interests that are not necessarily committed to sustainability goals. The disconnection in information among state agencies and the lack of collaboration between the public and the academic sectors further contribute to fragmented governance.

In sum, soil politics in NSW has been underpinned by a productivist ontology that organises decision making in complacency with the interests of powerful groups (e.g., the ruling elite and agroindustry sector). Against a scenario of depoliticisation, there is no accountability for how soils are used and managed and, thus, unsustainable practices that cause degradation may persist without control and appropriate guidance.

The Uruguayan case shows that a change of public perspective within the government can emerge from the cooperation between academic and policy sectors. Until the end of the 2000s, no mandatory soil regulation was in place. However, in the face of a potential ecological crisis due to increasing erosion triggered by changes in patterns of agricultural production, the scientific sector provided the government with a tool (the validated USLE/RUSLE equation for the country's conditions and the software Erosion 6.0 that runs the equation) to control erosion. Furthermore, it provided the rationale (i.e., level of soil loss tolerance) to limit predatory management practices that benefited the capital accumulation of producers in a context of record highs in soybean commodities. A form of power as a transformation through collaboration at the science-policy interface translated into a shift in how human-soils relationships should be governed and put soils sustainability on the agenda. Framing soil conservation as a matter of national interest (as stated in the soil conservation law) and thus, above individual private property rights paved the way for introducing soil management regulations. The government assumed the leadership in monitoring producers' practices and penalising infringement cases.

Scholars of postpolitical environmental politics, such as Erik Swyngedouw (2010, 2011, 2014), might not consider the attempt to re-politicise soils in NSW and the Uruguayan soils policy as forms of politicisation at all because, in his view, this emerges only from "radically divergent struggles over imagining and naming different socio-environmental futures" (2011, p. 267). However, as argued in Chapter 5, I concur with Anshelm and Haikola (2018, p. 565) in considering this position as risking "analytical insensitivity" to the political residing in acts that, though not directly confronting capitalism, emerge from its internal contradictions. The Uruguayan case reflects this reasoning more clearly: a left-wing government committed to principles of equity, solidarity, and care for the "other" introduced a regulation to prevent the continuation of irrational extractivist soil use and management, but it still preserved a model of development sustained in a "sensible" extractivism to fund social programs to reduce poverty. Therefore, although the policy did not transform human-soils relationships

radically (based on a program of ecological justice, for example), it made significant progress in terms of protection and governance. In the case of NSW, the policy proposal “Looking Forward, Acting Now” would have been an important step to overcome the fragmented governance with an integrated approach concerned with soil health and reinstatement of public responsibility in soil protection, an alternative to a privatised domain. After all, any politicisation move cannot be perfect in the sense of fully achieving “the political” since this is the reminder of the absent ground or unsuccessful grounding of any attempt at sedimentation practices (Marchart, 2007, p. 2). Full attainment of “the political” must be considered a sort of utopia; though unreachable, it helps us think about how to move toward socially and ecologically just orders guided by ethical principles of care, respect for otherness, and conviviality. Furthermore, in environmental politics, it serves to critically scrutinise depoliticising framing strategies that enable depletion of the environment for the sake of capital accumulation, without any liability for the harm caused or recognition of the contributions that the environment makes to wealth creation.

8.4 About soils justice and awareness creation

Framings of environmental problems carry interpretations about what the problem is, which, in turn, as has been reiterated, contain ethical assumptions about how human-nature relationships should be governed. As highlighted in Chapter 7, the meta-consequential discussion of the Anthropocene thesis suggests that we should reflect on political institutions, justice, ethics, and institutions that may be perpetuating degradation processes (Dryzek & Pickering, 2019). An ecological approach to justice puts under question modern liberal accounts of justice grounded in anthropocentric ethics by considering that non-humans (either individual living entities or wholes such as ecosystems) also belong to the community of justice. Therefore, by adopting an ecological justice lens, we can interrogate framings with a critical perspective that looks at how selecting and storytelling includes or excludes non-humans (or certain aspects of their

materiality, for example, some soil functions or processes instead of the ecosystem) from the community of moral considerability. To this perspective, excluding non-humans from the realm of justice constitutes a form of misrecognition and misrepresentation (Schlosberg, 2007, 2014) and a lack of political responsibility that accelerates degradation and hinders awareness creation, remaining absent from our minds.

Chapter 7 explores how the Uruguayan soil protection regime is framing soils, considering that it has become a world exemplar in soil governance (Peake & Robb, 2022). More specifically, it delves into its flagship conservation policy to elicit emergent notions of responsibility, recognition and representation that could serve to inspire politicising reframings in other jurisdictions. Soil degradation was not an issue in Uruguay by the end of the 20th century because the main problem, soil erosion, had been controlled with the adoption of crop-pasture rotations and the integration of livestock and cropping (reducing the demand for inputs). Furthermore, the cropping area experienced a progressive reduction since the 1960s. However, this scenario drastically changed during the 2000s with the expansion and intensification of soybean production motivated by the rising international prices of this commodity. The analysis revealed that in Uruguay, the political system provided the conditions for developing a model of “predatory extractivism” driven by foreign capital (Gudynas, 2011). Besides the good fertility of soils and low land prices compared to the region, the deregulation and liberalisation of the economy was an enticement for investors. Agronomists were monitoring the changes in the agricultural sector (e.g., expansion of cropping area with monocultures, continuous cropping, and intensive use of fertilisers and pesticides) with growing concern. The leftist coalition that came into office in 2005 (until 2020) developed, in collaboration with experts, the soil policy that became compulsory in 2013 after three years of a pilot phase. The SUMP aims to prevent unsustainable management practices and uses that are aggressive with the environment (e.g., erosion, biodiversity loss, water pollution) whilst greatly benefiting capital accumulation (mostly of foreign investors). With this policy, soils became politicised with the amplification of the policy agenda (Hay, 2007;

Jenkins, 2011), later complemented by other instruments (e.g., the National Adaptation Plan to Climate Variability and Change for the Agricultural Sector and the Agroecological Law). Soils politicisation is underpinned by a productivist ontology concerned with the environmental impacts of unsustainable practices. In this process, the state assumes an active role in controlling and supervising compliance with the policy, prioritising soil conservation as a matter of national interest over private property rights. Although soils are valued instrumentally (i.e., food provision), the SUMP's made significant progress in terms of protection, governance and awareness creation. Yet, there is scope for improvement, as argued in Chapter 7. In this vein, the Agroecology Law, the implementation of which is under discussion, has the potential to transition toward an ecological justice that recognises soils as ecosystems themselves simultaneously embedded in the larger agroecological ecosystems. Furthermore, it could overcome soils commodification by focusing on local markets and family farming production systems and positioning social-ecological interests over market liberalism.

Analysing what notions of justice are articulated in framings opens the opportunity to discuss and imagine alternatives to depoliticised environmental issues. Developing visions about sustainable futures that “ought to be attained” (Beck et al., 2021, p. 144) is a necessary exercise to shape preferences and guide attitudes and policy choices. Lakoff (2010, p. 76) has argued that contemporary societies suffer from environmental *hypocognition* or the tragedy of the absence of frames, which is “the lack of ideas we need”. But those frames can be planned and created in his view by, for example, telling stories that appeal to sustainability moral values and rouse emotions. In a similar way, Dark (2017, p. 223) claims that deficient mental models can be corrected in an “empathetic and open-minded way”. Other soils frames beyond the merely productivist include, for example, global commons (Amundson, 2020; Bollier & Helfrich, 2019; Creutzig, 2017), soil ecosystem services (Bartkowski et al., 2018; Pereira et al., 2018), soil security (Koch et al., 2013; McBratney et al., 2017), soil health (Janzen et al., 2021; Stronge et al., 2020), soil biodiversity (Nielsen et al., 2015; Pascual et al., 2015), bioinfrastructure (Puig de la Bellacasa, 2014), and soil care (Krzywoszynska, 2021; Puig de la

Bellacasa, 2015). A radical proposal from renowned soil scientist Rattan Lal (2019) is the attribution of rights to soil. In his view, soils ought to be considered living entities that sustain life and have “a right to thrive, flourish, and be protected” (Lal, 2019, p. 81A).

Finally, stimulating inter- and trans-disciplinary work and relational thinking could enhance the construction of stronger framings for soils. Thinking about human-nonhuman relationships in terms of relationality instead of transactionality could contribute to creating empathy and sensitivity toward our biophysical milieu. As stated in Chapter 7, thinking about ourselves and the material world in relational terms might create awareness about our interconnections and interdependence and help us redefine our relationships in more ethical and sustainable ways (West et al., 2020), motivating attitudinal and policy change. Note that I refer to relational thinking instead of ontology because I have argued in this dissertation (see Chapter 2) that the latter indicates a certain horizontality and distributed agency between humans and non-humans that obscures the intentional harmful practices perpetrated by the former on the latter.

In addition, framings could be enhanced by the collaborative work among diverse disciplines and stakeholders, as explained in Chapter 3. Agronomists and soil scientists have been historically the authoritative voice on soil issues. However, literature on soils has been flourishing in the past decade in other disciplinary fields, such as the environmental humanities and the social sciences. These contributions provide innovative ways to think about soils, for example, as non-human labourers (Krzywoszynska, 2020), as a “matter” for care and attentiveness (Krzywoszynska, 2021; Puig de la Bellacasa, 2015), as vital in decomposition (Lyons, 2020), as graves for toxic waste and greenhouse gases (Kearnes & Rickards, 2015), and as agents in the making of climates (Granjou & Salazar, 2019), amongst many others.

8.5 Conclusions

This chapter has synthesised and discussed the results obtained in the empirical chapters using the PoFF. The framework assisted in capturing alignments and tensions between scientists' and policymakers' framings of soils and their consequences in terms of their de/politicisation. To date, soils continue to be on a path of depoliticisation in NSW. However, the Australian scientific community has been building robust frameworks such as soil security and soil health, which could potentially transform public approaches to soils as has happened in other Australian states (e.g., Tasmania and Western Australia). In Uruguay, a process of politicisation has been inaugurated with the SUMP's policy and subsequent policy developments. However, returning to a conservative government aligned with neoliberal ideas in 2020 could discourage this path. Although the SUMP's policy has remained unchanged, the recent conflict regarding the implementation of the Agroecology Law demonstrates that a change in preferences could take place at any time.

Finally, although this work was inspired by policy and policy process studies, this research has adopted a creative, interdisciplinary approach instead of considering a more conventional, disciplinary approach to politics and policy dynamics. Three reasons underlie this methodological decision. First, analysing complex environmental problems requires broadening and enriching the lens through which we can capture the diverse dimensions that constitute such complexity. Thus, analysis wedded to a single discipline can miss critical information about this intricate problem. Second, confronted with the necessity to better understand the dynamics of framing, and thus, only through integrating diverse theoretical strands (e.g., political and social sciences, political ecology, and environmental humanities) could I find a way to organise how these processes work. Third, and most importantly, creative thinking is a fundamental aspect of sustainability research. As part of the doctoral program I have undertaken in sustainable futures, taking unconventional research pathways based on inter- and trans-disciplinary approaches is encouraged and posited as desirable.

Chapter 9

Conclusions

“We desperately need a kinder, more cooperative, more reflective society to emerge from the rubble of neoliberal globalisation. Acute income inequality, the forces of economic competition, the dominance of secular rationality, the prevalence of consumerism, the doctrine of endless growth, the lingering effects of colonialism, religious intolerance, cultural enmity, the hollowing-out of ‘public goods’, and the persistence of aggressive nationalisms: somehow, we need knowledge that can help us tackle all these things while also preventing runaway change to our precious planet”.
(Castree, 2021, p. XV)

Human-induced soil degradation is a multiscale social-ecological challenge that is on a trajectory of aggravation if governments and the international community do not engage in promoting protection schemes and halting unsustainable uses and management practices. Today there is growing evidence of the importance of maintaining healthy soils for sustaining life (Lehmann et al., 2020; Veerman et al., 2020) and that human activity operates within a safe space that does not exceed the planetary boundaries (Kopittke et al., 2021; Kraamwinkel et al., 2021). Furthermore, there are claims that soils should be protected for their own sake (Celermajer & O’Brien, 2020; Lal, 2019). Although recently they have been gaining greater attention by emphasising their connection to environmental problems such as climate change and biodiversity loss, “dedicated soil legislation remains conspicuous by its absence” (Peake & Robb, 2022, p. 3) both at the global

and local levels – where soils issues are mostly indirectly addressed. Many scholars have claimed the necessity to raise public awareness of soil threats (e.g., erosion, loss of organic matter, soil biodiversity loss, fertility decline, soil contamination and soil sealing) and to develop explicit and coherent soil policies (Davies, 2017; Li & Messner, 2021; Montanarella, 2015). However, despite the abundant scientific research on soils, the governance dimension is an under-researched area (Grunwald et al., 2017; Juerges & Hansjürgens, 2018). Furthermore, little research has been conducted on why soils are a low priority issue in the policy domain. This dissertation has explored this topic by providing insights into how soils became de/politicised in two jurisdictions.

Building on the analytical framework developed in Chapter 4 (the political ontology, power and justice dimensions of the Politics of Framing Framework), I addressed three research questions. Chapter 5 focused on the first research question: *How has the problem of soil degradation been framed in the past in New South Wales?* This question led to the analysis of soils' trajectory in NSW's policy arena to identify shifts in framing human-soils relationships and their impacts in terms of agenda setting. In this instance, I find three distinctive phases in which soils were 1) politicised, 2) depoliticised, and 3) attempted to be re-politicised. First, after a long history of unsustainable management practices that increased erosion of the already weathered and nutrient-poor soils, by the end of the 1930s, the NSW government adopted an interventionist approach toward soils management with the passing of the Soil Conservation Act and the creation of the Soil Conservation Service. This entity had a fundamental role in helping producers enhance their production techniques (e.g., minimum tillage, retention of crop residues, and rotation of crops), benefiting the condition of the state's soils. Soils were an active area of policymaking until the end of the 1980s when a process of depoliticisation gradually marginalised them within the public sector and displaced responsibilities to landowners. This shift in framing human-soils relationships as a private "matter" coincided with the spread of neoliberal ideas in the public sector. I argued that soils were depoliticised as a result of three sub-acts: a) the dissolution of the SCS and transference of responsibilities of soil conservation actions to the private

sphere (institutional depoliticisation); b) the enactment of integrated resource laws under discourses of efficiency which relegated soils within integrated NRM schemes (rule-based depoliticisation); c) the emergence of a new environmental agenda that displaced the public focus on soil conservation to other problems (preference-shaping depoliticisation). A third shift occurred after the crisis caused by the Red Dawn dust storm in 2009 when a window of opportunity for introducing a new soil policy opened. Experts and policymakers developed an ambitious proposal that portrayed the soil as an overarching natural resource that supports all terrestrial ecosystems restoring public responsibility for the protection of soils. Applying the political ontology dimension of the PoFF, I argued that this re-politicisation strategy failed to be adopted by the conservative government appointed in 2011 due to incompatible visions about what soils are and how they should be governed (conservation vs commodification, aesthetics vs development, co-responsibility vs property rights). Consequently, soils continued to be depoliticised and approached in a fragmented way.

Chapter 6 addressed the second research question: *How is the problem of soil degradation currently being framed in New South Wales' policy arena?* This question aimed to explore how dominant soil framings are shaping the governance of NSW soils and reinforcing the current order of human-soils relationships. To do so, I used the power dimension of the framework to analyse how ideologies, interests and information-processing are mobilised in selecting and storytelling to legitimise policy preferences of relevant actors at the science-policy interface. Despite claims of experts that soils problems are not adequately addressed in policy and that the model of governance is disorganised, senior bureaucrats argued that there are no substantial soil problems in the state to justify a policy change. Furthermore, it was suggested that policies would not necessarily achieve desired outcomes. I argued that this prevailing framing of soils at the state level as a non-political matter perpetuates depoliticisation by a) concealing non-decision making as a form of blocking power from the agenda, b) reinforcing sentiments of apathy towards politics and policy, and c) appealing to the problem-solving logic that suggests that only fixable problems require political intervention, which easily

justifies leaving out the complex web of soils functions and processes. In addition, at the federal level, recent discourses depicting soils as a “carbon capture technology” have emerged amid growing international and domestic pressure to adopt a clear net-zero emissions target by 2050. I argued that this depoliticising framing takes soils as an apolitical technological fix for climate change mitigation. Instead of suggesting a genuine attempt at re-politicisation, it appears to be a strategic move to control the agenda on climate change. These depoliticising framings are compliant with the interests of private landowners and the robust agroindustry sector, enabling the exploitation of soils as providers of agricultural commodities for capital accumulation sans public scrutiny over management practices. As scholars have claimed, this sector has sufficient influence to shape preferences and exclude issues that challenge their privileges (Botterill, 2006, 2016; Iles, 2021). Furthermore, soils depoliticisation endorses the absolutist interpretation of private property rights (Reeve, 2001) in the rural sector, enabling landowners to manage their soils as they will or to their best knowledge. The privatisation of soil management advice influenced by agroindustry commercial interests poses another risk for soil sustainability. The disparities in the information collected between state agencies with competencies over soils and the lack of cooperation and collaboration between the public and the academic sector further contribute to the fragmented governance, hindering the possibility of building coherent frameworks that support public advice on sustainable soils management. In sum, while soils continue to be marginalised in the policy domain, there is no accountability for how they are used and managed. Thus, unsustainable practices that cause degradation may persist without control and appropriate guidance.

Chapter 7 explored the third research question: *How can soils be reframed to secure sustainable and just soil futures following Uruguay’s recent soil policy developments?* This chapter explores the case of Uruguay, which has been praised by the international community (e.g., FAO & ITPS, 2015; World Bank, 2017) and considered one of the few “standard bearer(s) in soil governance” globally (Peake & Robb, 2022). The development of the Soil Use and Management Plans (2013) and

other instruments, such as the National Adaptation Plan to Climate Variability and Change for the Agricultural Sector (NAP-Agro, 2019) and the Agroecology Law (2018), have amplified the agenda for soils enhancing their governance. A potential erosion crisis caused by the sudden expansion and intensification of soybean production in the first decade of the 2000s prompted the convergence of framings at the science-policy interface and the adoption of the SUMPs to refrain from extractivist predatory practices. The state had a critical role in implementing an explicit soil protection policy, framing soils as a matter of national interest that justifies the state's intervention in private properties to monitor their management practices (e.g., establish crop and pasture rotations and adjust their production to the tolerable levels of soil erosion based on the USLE/RUSLE equation) and even issue penalties to producers in case of infringements. Although it is a simple tool built upon an agronomic equation, it has been widely adopted by farmers, reaching 96 per cent compliance. Furthermore, even though this policy protects those soil functions related to productivity, I argued that the enactment of the Agroecology Law has the potential to transition towards a coherent protection model by looking at soils as ecosystems embedded in agroecological systems. Furthermore, it can be a fundamental step in the transition toward a post-extractivist model that overcomes soils commodification based on agroecological principles of food production, challenging capitalistic industrial agriculture. Though justice for soils is framed from an anthropocentric perspective, the Uruguayan Government has transformed human-soils relationships in the productive sector, compelling producers to be more attentive and careful in their interactions to reverse and prevent harm. The responsibility assumed by the state in prioritising soils conservation over private interests and property rights and holding producers accountable for their actions is a crucial component to securing just and sustainable futures for soils.

Research Contributions

The contributions of this research are fourfold. First, from a *theoretical perspective*, this thesis contributes to an enhanced understanding of the ways in which politicisation and depoliticisation strategies influence the politics of soils and the prominence of soils in the policy process. This dissertation has demonstrated that soils are indeed (a) political matter and that framings are used intentionally to create de/politicising effects that exclude or include them into the agenda. Actors aiming to create awareness and promote policy change seek to politicise soils by portraying them as a policy problem that demands governmental action instead of confining it to the private realm. On the other hand, actors seeking to sustain the status quo that marginalises soil from the agenda characterise soils as a non-political or apolitical issue that does not pertain to the governmental sphere. Consequently, framings as mobilisers of issues' de/politicisation have relevant implications for the way we construct our relationships with nature. Soils depoliticisation is a pervasive governing strategy that complies with the interests of powerful groups that seek to maintain exploitative schemes for the extraction of commodities from the soil without accountability for harmful practices and due respect for the integrity of soils functions and processes. However, as has also been demonstrated, depoliticisation contains the potential for re-politicisation, and therefore, there is hope that transformation can emerge from the inner contradictions of such discourses that aim to sustain the status quo. This thesis also contributes to the study of soil governance, an under-researched area, by focusing on how agenda setting and decision making processes unfolded in two jurisdictions where framing divergences and convergences at the science-policy interface have resulted in different outcomes for soils protection.

Second, from a *methodological perspective*, this dissertation provides a novel framework, the Politics of Framing Framework, a theoretically informed tool that can be used for understanding and exploring the politics of soil and other areas of environmental governance. As an interdisciplinary tool, it transcends disciplinary boundaries to assist in the critical analysis of environmental framings and capture

the complexity of processes of the social construction of environmental problems. Furthermore, it contributes to framing analysis by providing an organising principle for the inquiry of naming, selecting and storytelling, the three interrelated processes in framing public issues. The framework helps to organise the analysis of framings and explore differences and convergences in actors' descriptions, explanations, and justifications in their interpretations of soil degradation as a public problem. By suggesting directions to approach empirical evidence based on three dimensions as boundaries for exploring problem framing: political ontology, power, and justice, a more comprehensive understanding can be reached and, considered collectively, convergencies or agreements can be constructed. Thus, by applying these dimensions, analysts from diverse disciplinary backgrounds could be better positioned to critically engage with the contents of framings and how they are mobilised to influence or deter the movement of issues across agendas.

Third, from an *empirical perspective*, this thesis makes a substantial contribution to understanding and documentation in the academic literature of recent political and policy history in New South Wales during a period of significant soil policy reform. There are insufficient records of the relevant institutional changes that soil has undergone in the past three decades. Little is known about how these changes unfolded and their effects on soils. This research fills this gap by systematically analysing how these silent movements occurred over time and the strategies used to legitimise policy choices. Although in the case of Uruguay, there is more available literature about the recent policy developments due to the international prominence of this example, this research provides a different perspective to analyse an environmental policy reform. By applying a novel lens, i.e., that of ecological justice, which is often overlooked in policymaking, the research contributes to understanding the inclusion of non-humans in the policy domain based on an ecocentric perspective that considers the kind of soil ethics and justice underpinning the soil policy in Uruguay.

Fourth, from a *pragmatic perspective*, a series of recommendations follow this investigation with the aim of contributing to re-politicising strategies.

- First, identify how depoliticising narratives operate in order to find the metaframings that can rescue what is being omitted or excluded from them (for example, what aspects of the problem of degradation are not being recognised, what soil functions and processes are being neglected, how is the political nature of soils obscured with non-political or apolitical framings, who or what is not being included as part of the community of justice). These alternative constructions of the problem could help visualise what other social-ecological orders are possible beyond the status quo.
- Second, framings should select and emphasise the public good nature of soils. Soils are not in themselves a private asset but rather by their attachment to the land, which is, indeed, mostly privately owned. However, the vast array of functions and processes performed by the complex web of living organisms belowground cannot be “owned” by individuals. They belong to the planetary system, and thus, responsibility for their protection should fall on public authorities as guardians of the common good instead of market-based mechanisms. As the Uruguayan case reveals, placing soils as a matter of national interest was fundamental to promoting their politicisation and justifying their inclusion in the agenda.
- Third, soils framings should emphasise the vital processes and functions performed by soils to stimulate relational thinking and create awareness about our interconnections. Thinking about soils in terms of relationality helps to visualise their liveliness and their vital contributions to the processes that support life on Earth. Through relational thinking, framings can create empathy and sensitivity toward what otherwise tends to be conceived as “dead matter” or “dirt”.
- Fourth, framings could be enhanced by the collaborative work between diverse disciplines and stakeholders. Soil science and agronomy would benefit from including narratives from the social sciences and environmental humanities that provide innovative and creative ways to think about soils that could be more compelling to the broader public.

- Fifth, build trust and foster dialogue between the academic and public sectors to find grounds for convergence about the problem and how it should be addressed. As demonstrated in the Uruguayan case, cooperation and collaboration amongst the two communities was a fundamental factor in advancing the soil protection cause and enhancing soils governance.

Limitations

The first limitation of this research is its focus on two elite communities (i.e., experts and policymakers) that are in privileged positions to influence and shape societal preferences about what they consider desirable social-ecological orders. Although the reasons for selecting this research boundary have been made explicit in Chapter 4, I acknowledge that it is a partial vision of the big picture about how human-soils relationships could be governed. Consequently, this leads to the second limitation: the research has not explored all the potential metaframings that are being excluded or ignored in the policy arena. Such metaframings include, for example, those coming from Aboriginal land management in Australia and other indigenous practices around the world, familiar farmers, permaculture movements, and other grassroots movements dedicated to soils protection. These alternative perspectives could enrich the discussion about pathways for future sustainable soil governance. A third limitation derives from the scientific profiles of interviewees in this research: soil scientists and agronomists. Although these disciplinary fields have been historically the authoritative voice regarding soil issues, new insights are emerging from other areas, such as the social sciences and environmental humanities, and deserve consideration.

Further research

This dissertation opens the door for further inquiry into alternative soil framings coming from groups that have not been included in the current work and whose voices are relevant to addressing soil politics. For example, the PoFF could be applied to analyse soil framings amongst Aboriginal and indigenous groups, family

farmers, permaculture organisations and other grassroots movements advocating for soil care and protection. Furthermore, it can also be used in other jurisdictions facing policy gridlocks and seeking to explore pathways to overcome them. In addition, the application of the PoFF can expand to new research avenues in other environmental areas where depoliticising discourses are dominant. New applications can incorporate or suggest changes to the categories included in this framework. They can also identify difficulties in its application that should be addressed to enhance this tool.

Concluding remarks

At the beginning of this chapter, I quoted Castree's recent reflection on the urgent necessity for kinder, more cooperative and reflective societies. Indeed, we need to rethink our relationships with our biophysical world, considering the predicament in which we have put ourselves. This dissertation sought to make visible the utter importance of soils for all forms of life and contribute to the efforts of many in creating sensitivity and empathy to this marvellous and largely unknown "allied". I also hope this dissertation contributes to the ongoing conversation about the ways in which environmental policy can introduce the non-human as agents of ecological justice and move toward socially and ecologically just orders guided by ethical principles of care, respect for otherness, and conviviality.

Bibliography

- Achkar, M., Domínguez, A., Díaz, I., & Pesce, F. (2011). La intensificación del uso agrícola del suelo en el litoral oeste del Uruguay en la última década. *PAMPA*, 7, 143–157.
- Ackoff, R. L. (1974). *Redesigning the future*. Wiley.
- Adamowicz, W. L. (1991). Valuation of environmental amenities. *Can. J. Agric. Econ.*, 39, 609–618. <https://doi.org/10.1111/j.1744-7976.1991.tb03612.x>
- Akhtar-Schuster, M., Stringer, L., Erlewein, A., Metternicht, G., Minelli, S., Safriel, U., & Sommer, S. (2017). Unpacking the concept of land degradation neutrality and addressing its operation through the Rio Conventions. *Journal of Environmental Management*, 195, 4–15. <https://doi.org/10.1016/j.jenvman.2016.09.044>
- Alcántara, I., Somma, A., Chalar, G., Fabre, A., Segura, A., Achkar, M., Arocena, R., Aubriot, L., Baladán, C., Barrios, M., Bonilla, S., Burwood, M., Calliari, D. L., Calvo, C., Capurro, L., Carballo, C., Céspedes-Payret, C., Conde, D., Corrales, N., ... García-Rodríguez, F. (2022). A reply to “Relevant factors in the eutrophication of the Uruguay River and the Río Negro.” *Science of the Total Environment*, 818, 151854–. <https://doi.org/10.1016/j.scitotenv.2021.151854>
- Allen, A. (1998). Re-thinking power. *Hypatia*, 13(1), 21–40. <https://doi.org/10.5840/10.2307/3857528>
- Allen, A. (2018). *The power of feminist theory: Domination, resistance, solidarity* (2nd ed.). Routledge.
- Altieri, M. A., Nicholls, C. I., & Montalba, R. (2017). Technological approaches to sustainable agriculture at a crossroads: An agroecological perspective. *Sustainability (Switzerland)*, 9(3), 349–. <https://doi.org/10.3390/su9030349>
- Alvesson, M., & Sandberg, J. (2013). *Constructing research questions: Doing interesting research*. SAGE.
- Amundson, R. (2020). The policy challenges to managing global soil resources. *Geoderma*, 379, 114639–. <https://doi.org/10.1016/j.geoderma.2020.114639>
- Amundson, R., Berhe, A., Hopmans, J., Olson, C., Sztein, A., & Sparks, D. (2015). Soil and human security in the 21st century. *Science*, 348(6235). <https://doi.org/10.1126/science.1261071>
- Amundson, R., & Biardeau, L. (2019). Opinion: Soil carbon sequestration is an elusive climate mitigation tool. *Proceedings of the National Academy of Sciences of the United States of America*, 116(26), 13143–. <https://doi.org/10.1073/pnas.1908917116>

- Ansell, C., & Bartenberger, M. (2017). Tackling unruly problems. In C. Ansell, J. Trondal, & M. Øgård (Eds.), *Governance in turbulent times* (pp. 107–136). Oxford University Press.
- Ansell, C., & Geyer, R. (2017). “Pragmatic complexity” a new foundation for moving beyond evidence-based policy making? *Policy Studies*, 38(2), 149–167. <https://doi.org/10.1080/01442872.2016.1219033>
- Anshelm, J., & Haikola, S. (2018). Depoliticization, repoliticization, and environmental concerns: Swedish mining politics as an instance of environmental politicization. *ACME: An International e-Journal for Critical Geographies*, 17(2), 561–596.
- Arbeletche, P. (2020). El agronegocio en Uruguay: Su evolución y estrategias cambiantes en el siglo XXI. *Rivar*, 7(19), 109–129. <https://doi.org/10.35588/rivar.v7i19.4355>
- Arbeletche, P., & Gutiérrez, G. (2010). Crecimiento de la agricultura en Uruguay: Exclusión social o integración económica en redes. *PAMPA, Revista Interuniversitaria de Estudios Territoriales*, 6, 113–138.
- Arendt, H. (1970). *On Violence* (Vol. 53, Issue 9). Harcourt Brace Jovanovich.
- Arias-Arévalo, P., Gómez-Baggethun, E., Martín-López, B., & Pérez-Rincón, M. (2018). Widening the evaluative space for ecosystem services: A taxonomy of plural values and valuation methods. *Environmental Values*, 27(1), 29–53. <https://doi.org/10.3197/096327118X15144698637513>
- Arias-Maldonado, M. (2011). Let’s make it real: In defense of a realistic constructivism. *Environmental Ethics*, 33(4), 377–393. <https://www.researchgate.net/publication/286748491>
- Arias-Maldonado, M. (2015). *Environment and Society: Socionatural Relations in the Anthropocene*. Springer.
- Arias-Maldonado, M. (2016). El giro antropocénico. Sociedad y medio ambiente en la era global. *Política y Sociedad*, 53(3), 7–32.
- Arias-Maldonado, M. (2019). The “Anthropocene” in philosophy: The neo-material turn and the question of nature. In F. Biermann & E. Löwbrand (Eds.), *Anthropocene encounters: New directions in green political thinking* (pp. 50–66). Cambridge University Press. <https://doi.org/10.1017/9781108646673>
- Arias-Maldonado, M. (2020). Blooming landscapes? The paradox of utopian thinking in the Anthropocene. *Environmental Politics*, 29(6), 1024–1041. <https://doi.org/10.1080/09644016.2019.1703384>
- Arnold, R. W., Szabolcs, I., Targulian, V., & (Eds.). (1990). *Global soil change*. International Institute for Applied System Analysis, International Society of Soil Science, United Nations Environmental Programme. <https://pure.iiasa.ac.at/id/eprint/3458/1/CP-90-002.pdf>

- Arrona, A. (2017). *Can interpretive policy analysis contribute to a critical scholarship on regional innovation policy studies?* [Working paper]. Orkestra Working Paper Series in Territorial Competitiveness, Vol. 01. <https://www.researchgate.net/publication/313577952>
- Artacker, T., Campanini, J., & Gudynas, E. (2020). Extractivismos agropecuarios en tiempos de pandemia: flexibilizaciones, asimetrías, autoritarismos y otros efectos derrame. *Yeiyá*, 1(1), 89–107. <https://doi.org/10.33182/y.viii.1303>
- Asafu-Adjaye, J., Blomquist, L., Brand, S., Brook, B. W., DeFries, R., Ellis, E., Foreman, C., Keith, D., Lewis, M., Lynas, M., Nordhaus, T., Roger Pielke, Jr., Pritzker, R., Roy, J., Sagoff, M., Shellenberger, M., Stone, R., & Teague, P. (2015). *An ecomodernist manifesto*. <http://www.ecomodernism.org/manifesto-english>
- Asikainen, E., & Jokinen, A. (2009). Future natures in the making: Implementing biodiversity in suburban land-use planning. *Planning Theory and Practice*, 10(3), 351–368. <https://doi.org/10.1080/14649350903229794>
- Aubriot, L., Zabaleta, B., Bordet, F., Sienra, D., Risso, J., Achkar, M., & Somma, A. (2020). Assessing the origin of a massive cyanobacterial bloom in the Río de la Plata (2019): Towards an early warning system. *Water Research*, 181, 115944–. <https://doi.org/10.1016/j.watres.2020.115944>
- Aukes, E. (2017). *Framing coastal squeeze: Understanding the integration of Mega-nourishment schemes into the Dutch coastal management solutions repertoire. An interpretive analysis of coastal management processes* [Doctoral dissertation, University of Twente]. University of Twente Research Information. <https://doi.org/10.3990/1.9789036543729>
- Aukes, E., Bontje, L., & Slinger, J. (2020). Narrative and frame analysis: Disentangling and refining two close relatives by means of a large infrastructural technology case. *Forum Qualitative Sozialforschung*, 21(2). <https://doi.org/10.17169/fqs-21.2.3422>
- Australian Bureau of Agricultural and Resource Economics. (2016). *Land Use of Australia 2010–11*. <https://www.awe.gov.au/sites/default/files/abares/aclump/documents/Land%20ouse%20in%20Australia%20at%20a%20glance%202016.pdf>
- Australian Bureau of Agricultural and Resource Economics. (2021). *About my region dashboard – New South Wales*. https://public.tableau.com/app/profile/australian.bureau.of.agricultural.and.resource.economics.and.sci/viz/AMR_v9_A3L/Dashboard1
- Australian Government. (2021). *The Plan to Deliver Net-Zero. The Australian Way*. <https://apo.org.au/sites/default/files/resource-files/2021-10/apo-nid314748.pdf>
- Australian Government Department of Agriculture, Fisheries and Forestry (2014). *The National Soil Research, Development and Extension Strategy. Securing*

- Australia's soil, for profitable industries and healthy landscapes*. DAFF. <https://www.agriculture.gov.au/sites/default/files/documents/soil.pdf>
- Autin, W. J., & Holbrook, J. M. (2012). Is the Anthropocene an issue of stratigraphy or pop culture? *GSA Today*, 22(7), 60–61. <https://doi.org/10.1130/G153GW.1>
- Avelino, F., & Rotmans, J. (2011). A dynamic conceptualization of power for sustainability research. *Journal of Cleaner Production*, 19(8), 796–804. <https://doi.org/10.1016/j.jclepro.2010.11.012>
- Bacchi, C. (1999). *Women, policy and politics: The construction of policy problems*. SAGE.
- Bacchi, C. (2009a). *Analysing policy: What's the problem represented to be?* Pearson Australia.
- Bacchi, C. (2009b). The issue of intentionality in frame theory: The need for reflexive framing. In E. Lombardo, P. Meier, & M. Verloo (Eds.), *The discursive politics of gender equality. Stretching, bending and policymaking* (pp. 19–35). Routledge. <https://doi.org/10.5840/protosociology2011276>
- Bacchi, C. (2012). Why study problematizations? Making politics visible. *Open Journal of Political Science*, 2, 1–8. <https://doi.org/10.4236/ojps.2012.21001>
- Bacchi, C. (2016). Problematizations in health policy: Questioning how “problems” are constituted in policies. *SAGE Open*, 6(2). <https://doi.org/10.1177/2158244016653986>
- Bachrach, P., & Baratz, M. S. (1962). Two faces of power. *The American Political Science Review*, 56(4), 947–952.
- Baeza, S. (2016). *El uso/cobertura del suelo en Uruguay y los pastizales del Río de la Plata: caracterización, análisis de sus cambios a lo largo del tiempo e impactos sobre el funcionamiento ecosistémico* [Doctoral dissertation, Universidad de la República, Uruguay]. Colibri Tesis de Posgrado. <https://www.colibri.udelar.edu.uy/jspui/handle/20.500.12008/10172>
- Baeza, S., & Paruelo, J. M. (2020). Land use/land cover change (2000–2014) in the Río de la Plata grasslands: An analysis based on MODIS NDVI time series. *Remote Sensing*, 12(3), 381–. <https://doi.org/10.3390/rs12030381>
- Bai, Z. G., de Jong, R., & Van Lynden, G. W. J. (2010). *An update of GLADA –Global Assessment of Land Degradation and Improvement*. GLADA Report Update. ISRIC Report 2010/08, ISRIC - World Soil Information. https://www.isric.org/sites/default/files/isric_report_2010_08.pdf
- Bai, Z. G., Dent, D. L., Olsson, L., & Schaepman, M. E. (2008). Proxy global assessment of land degradation. *Soil Use and Management*, 24(3), 223–234. <https://doi.org/10.1111/j.1475-2743.2008.00169.x>
- Bailey, J.-S. (2016). Wartime political ambition behind one image of a dam in “Australia is developing” a dust bowl (1943): US/Australian film imagery,

- environment, and nationalist storytelling. *International Review of Environmental History*, 2, 35–77.
- Baldock, J. A., Wheeler, I., McKenzie, N., & McBratney, A. (2012). Soils and climate change: Potential impacts on carbon stocks and greenhouse gas emissions, and future research for Australian agriculture. *Crop and Pasture Science*, 63(3), 269–283. <https://doi.org/10.1071/CP11170>
- Balvanera, P., Jacobs, S., Nagendra, H., O'Farrell, P., Bridgewater, P., Crouzat, E., Dendoncker, N., Goodwin, S., Gustafsson, K. M., Kadykalo, A. N., Krug, C. B., Matuk, F., Pandit, R., Sala, J. E., Schröter, M., & Washbourne, C. (2020). The science-policy interface on ecosystems and people: Challenges and opportunities. *Ecosystems and People*, 16(1), 345–353. <https://doi.org/10.1080/26395916.2020.1819426>
- Bansal, S., Chakraborty, P., & Kumar, S. (2022). Crop–livestock integration enhanced soil aggregate-associated carbon and nitrogen, and phospholipid fatty acid. *Scientific Reports*, 12(1), 2781–. <https://doi.org/10.1038/s41598-022-06560-6>
- Baraibar, M. (2020). *The political economy of agrarian change in Latin America: Argentina, Paraguay and Uruguay*. Palgrave Macmillan. <https://doi.org/10.1007/978-3-030-24586-3>
- Barbalet, J. M. (1987). Power, structural resources and agency. *Perspectives in Social Theory*, 8, 1–24.
- Bardgett, R., & Van Wensem, J. (2021). *Soil as natural capital*. KVAB Thinkers' report. Royal Flemish Academy of Belgium for Science and the Arts. <https://kvab.be/sites/default/files/bijlagen/FinalReportSoil.pdf>
- Bardwell, L. V. (1991). Problem-framing: A perspective on environmental problem-solving. *Environmental Management*, 15(5), 603–612. <https://doi.org/10.1007/BF02589620>
- Barry, A. (2020). What is an environmental problem? *Theory, Culture & Society*, 38(2), 93–117. <https://doi.org/10.1177/0263276420958043>
- Barry, B. (1989). *Theories of justice. A treatise on social justice, Volume I*. University of California Press.
- Barry, N. (2019). Australian political thought. In P. J. Chen, N. Barry, J. R. Butcher, D. Clune, I. Cook, A. Garnier, Y. Haigh, S. C. Motta, & M. Taflaga (Eds.), *Australian Politics and Policy* (pp. 32–50). Sydney University Press.
- Bartkowski, B., & Bartke, S. (2018). Leverage points for governing agricultural soils: A review of empirical studies of European farmers' decision-making. *Sustainability (Switzerland)*, 10(9). <https://doi.org/10.3390/su10093179>
- Bartkowski, B., Hansjürgens, B., Möckel, S., & Bartke, S. (2018). Institutional economics of agricultural soil ecosystem services. *Sustainability (Switzerland)*, 10(7), 1–14. <https://doi.org/10.3390/su10072447>

- Bason, Ch. (2017). *Leading public design. How managers engage with design to transform public governance* [Doctoral dissertation, Copenhagen Business School]. CBS PhD Series No. 21.2017.
<https://research.cbs.dk/en/publications/leading-public-design-how-managers-engage-with-design-to-transfor>
- Bates, G. M. S. (1987). *Environmental law in Australia*. Butterworth.
- Baumgartner, F. R., & Jones, B. D. (1993). *Agendas and instability in American politics*. University of Chicago Press.
- Baveye, Ph., Baveye, J., & Gowdy, J. (2016). Soil “ecosystem” services and natural capital: Critical appraisal of research on uncertain ground. *Frontiers in Environmental Science*, 4(41). <https://doi.org/10.3389/fenvs.2016.00041>
- Baveye, Ph., Berthelin, J., Tessier, D., & Lemaire, G. (2018). The “4 per 1000” initiative: A credibility issue for the soil science community? *Geoderma*, 309(Supplement C), 118–123. <https://doi.org/10.1016/j.geoderma.2017.05.005>
- Bawaka Country, Wright, S., Suchet-Pearson, S., Lloyd, K., Burarrwanga, L., Ganambarr, R., Ganambarr-Stubbs, M., Ganambarr, B., Maymuru, D., & Sweeney, J. (2016). Co-becoming Bawaka: Towards a relational understanding of place/space. *Progress in Human Geography*, 40(4), 455–475.
<https://doi.org/10.1177/0309132515589437>
- Baxter, B. (2005). *A theory of ecological justice*. Routledge.
<https://doi.org/10.4324/9780203458495>
- Bayram, S. A. (2016). *The use of the concept of intrinsic value in anthropocentric and non-anthropocentric approaches in environmental ethics: A metaethical investigation* [Doctoral dissertation, Middle East Technical University]. METU Library Theses and Dissertations Archives.
<https://etd.lib.metu.edu.tr/upload/12619889/index.pdf>
- Beck, S., Jasanoff, S., Stirling, A., & Polzin, C. (2021). The governance of sociotechnical transformations to sustainability. *Current Opinion in Environmental Sustainability*, 49, pp. 143–152.
<https://doi.org/10.1016/j.cosust.2021.04.010>
- Béland, D., & Howlett, M. (2016). The role and impact of the multiple-streams approach in comparative policy analysis. *Journal of Comparative Policy Analysis: Research and Practice*, 18(3), 221–227.
<https://doi.org/10.1080/13876988.2016.1174410>
- Bell, D. (2017). Justice on one planet. In S. M. Gardiner & A. Thompson (Eds.), *The Oxford Handbook of Environmental Ethics* (pp. 276–287). Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780199941339.001.0001>
- Bellamy, J. (2007). Adaptive governance: The challenge for regional natural resource management. In A. J. Brown & J. A. Bellamy (Eds.), *Federalism and regionalism in Australia: new approaches, new institutions* (pp. 95–118). ANU E-Press.

- Bellotti, B., & Rochecouste, J. F. (2014). The development of conservation agriculture in Australia – Farmers as innovators: A brief overview of conservation agriculture in Australia. *International Soil and Water Conservation Research*, 2(1), 21–34. [https://doi.org/10.1016/S2095-6339\(15\)30011-3](https://doi.org/10.1016/S2095-6339(15)30011-3)
- Bennett, J. (2004). The force of things: Steps toward an ecology of matter. *Political Theory*, 32(3), 347–372. <https://doi.org/10.1177/0090591703260853>
- Benton, T. (1981). “Objective” interests and the sociology of power. *Sociology*, 15(2), 161–184.
- Berretta, E. J., Risso, D., Montossi, F., & Pigurina, G. (2000). Campos in Uruguay. Grassland ecophysiology and grazing ecology. In G. Lemaire, J. Hogdson, A. de Moraes, C. Nabinger, & P. C. Carvalho (Eds.), *Grassland ecophysiology and grazing ecology* (pp. 373–394). CABI Publishing.
- Berrouet, L. M., Machado, J., & Villegas-Palacio, C. (2018). Vulnerability of socio-ecological systems: A conceptual framework. *Ecological Indicators*, 84, 632–647. <https://doi.org/10.1016/j.ecolind.2017.07.051>
- Beveridge, R. (2017). The (ontological) politics in depoliticisation debates: Three lenses on the decline of the Political. *Political Studies Review*, 15(4), 589–600. <https://doi.org/10.1177/1478929916664358>
- Beveridge, R., & Koch, P. (2017). The post-political trap? Reflections on politics, agency and the city. *Urban Studies*, 54(1), 31–43. <https://doi.org/10.1177/0042098016671477>
- Bevir, M. (2010). *Democratic governance*. Princeton University Press.
- Bevir, M. (2012). *Governance: A very short introduction*. Oxford University Press.
- Biermann, F., & Lövbrand, E. (2019). Encountering the “Anthropocene”: setting the scene. In F. Biermann & E. Lövbrand (Eds.), *Anthropocene encounters: New directions in green political thinking* (pp. 1–22). Cambridge University Press. <https://doi.org/10.1017/9781108646673>
- Birkland, T. (2005). *An introduction to the policy process: Theories, concepts, and models of public policy making* (3rd ed.). Routledge.
- Birkland, T. (2007). Agenda setting in public policy. In F. Fischer, G. J. Miller, & M. S. Sidney (Eds.), *Handbook of Public Policy Analysis: Theory, politics, and methods* (pp. 63–78). CRC Press, Taylor & Francis Group. <https://doi.org/10.1176/appi.ps.58.9.1231>
- Birrell, R., Hill, D., & Stanley, J. (Eds.) (1982). *Quarry Australia? Social and environmental perspectives on managing the nation’s resources*. Oxford University Press.
- Björnehed, E., & Erikson, J. (2018). Making the most of the frame: Developing the analytical potential of frame analysis. *Policy Studies*, 39(2), 109–126. <https://doi.org/10.1080/01442872.2018.1434874>

- Blaikie, P., & Brookfield, H. (Eds.) (1987). *Land degradation and society*. Routledge.
- Blaser, M. (2009). Political ontology: Cultural studies without “cultures”? *Cultural Studies*, 23(5–6), 873–896. <https://doi.org/10.1080/09502380903208023>
- Blühdorn, I. (2007). Sustaining the unsustainable: Symbolic politics and the politics of simulation. *Environmental Politics*, 16(2), 251–275. <https://doi.org/10.1080/09644010701211759>
- Blühdorn, I. (2015). Post-ecologist governmentality: Post-democracy, post-politics and the politics of unsustainability. In J. Wilson & E. Swyngedouw (Eds.), *The post-political and its discontents: Spaces of depoliticisation, spectres of radical politics* (pp. 146–166). Edinburgh University Press.
- Blum, W. E. H. (1988). *Problems of soil conservation*. Council of Europe.
- Bockheim, J. G., & Gennadiyev, A. N. (2010). Soil-factorial models and Earth-system science: A review. *Geoderma*, 159(3–4), 243–251. <https://doi.org/10.1016/j.geoderma.2010.09.005>
- Bodle, R., & Stockhaus, H. (2020). *Improving international soil governance – Analysis and recommendations. Final report*. German Environment Agency. https://www.umweltbundesamt.de/sites/default/files/medien/479/publikationen/texte_75-2020_3716_71_2100_uba_endbericht_internationaler_bodenschutz.pdf
- Boer, B., Ginzky, H., & Heuser, I. (2017). International soil protection law: History, concepts and latest developments. In H. Ginzky, I. Heuser, T. Qin, O. Ruppel, & P. Wegerdt (Eds.), *International Yearbook of Soil Law and Policy 2016* (pp. 49–72). Springer. <https://doi.org/10.1007/978-3-319-42508-5>
- Boer, B., & Hannam, I. (2015). Developing a global soil regime. *International Journal of Rural Law and Policy*, 1, 1–13. <https://doi.org/10.5130/ijrlp.i1.2015.4123>
- Boer, B., Martin, P., & Slobodian, L. (2016). *Framework for assessing and improving law for sustainability. A legal component of a natural resource governance framework*. International Union for Conservation of Nature. <https://www.iucn.org/resources/publication/framework-assessing-and-improving-law-sustainability>
- Bonneuil, C., & Fressoz, J.-B. (2016). *The shock of the Anthropocene: The Earth, history and us*. Verso Books.
- Bordoli, J. M., Barbazán, M. M., & Rocha, L. (2012). Soil nutritional survey for soybean production in Uruguay. *Agrociencia Uruguay*, 76–83. <http://164.73.52.167/ojs/index.php/agrociencia/article/view/649>
- Borsani, O., Castiglioni, E., Chiappe, M., Ferenczi, A., García, F., Pritsch, C., & Speranza, P. (2010). Biotecnología moderna, cultivos transgénicos y proceso de adopción en Uruguay. In F. García Prechac, O. Ernst, P. Arbeletche, M. Pérez Bidegain, C. Pritsch, A. Ferenczi, & M. Rivas (Eds.),

- Intensificación agrícola: Oportunidades y amenazas para un país productivo y natural* (pp. 29–66). CSIC, Universidad de la República, Uruguay.
- Bosomworth, K. (2015). Climate change adaptation in public policy: Frames, fire management, and frame reflection. *Environment and Planning C: Government and Policy*, 33(6), 1450–1466. <https://doi.org/10.1177/0263774X15614138>
- Bosselmann, K., Engel, R., & Taylor, P. (2008). *Governance for sustainability: Issues, challenges, successes*. IUCN. <https://www.iucn.org/resources/publication/governance-sustainability-issues-challenges-successes>
- Bot, A., Nachtergaele, F., & Young, A. (2000). *World soil resources report: Land resource potential and constraints at regional and country levels*. FAO. <https://www.researchgate.net/publication/262563293>
- Botterill, L. C. (2005). Policy change and network termination: The role of farm groups in agricultural policy making in Australia. *Australian Journal of Political Science*, 40(2), 207–219. <https://doi.org/10.1080/10361140500129982>
- Botterill, L. C. (2006). Soap operas, cenotaphs and sacred cows: Country mindedness and rural policy debate. *Public Policy*, 1(1), 23–36.
- Botterill, L. C. (2016). Agricultural policy in Australia: Deregulation, bipartisanship and agrarian sentiment. *Australian Journal of Political Science*, 51(4), 667–682. <https://doi.org/10.1080/10361146.2016.1239567>
- Boulding, K. E. (1990). *Three faces of power*. SAGE.
- Bouma, J. (2015a). Policy and effective action for soil security: A need for reframing the soil story. *IOP Conference Series: Earth and Environmental Science*, 25(1), 12002–. <https://doi.org/10.1088/1755-1315/25/1/012002>
- Bouma, J. (2015b). Reaching out from the soil-box in pursuit of soil security. *Soil Science and Plant Nutrition*, 61(4), 556–565. <https://doi.org/10.1080/00380768.2015.1045403>
- Bouma, J., & McBratney, A. (2013). Framing soils as an actor when dealing with wicked environmental problems. *Geoderma*, 200–201, 130–139. <https://doi.org/10.1016/j.geoderma.2013.02.011>
- Bouma, J., & Montanarella, L. (2016). Facing policy challenges with inter- and transdisciplinary soil research focused on the UN Sustainable Development Goals. *Soil*, 2(2), 135–145. <https://doi.org/10.5194/soil-2-135-2016>
- Bouma, J., Montanarella, L., & Evanylo, G. (2019). The challenge for the soil science community to contribute to the implementation of the UN Sustainable Development Goals. *Soil Use and Management*, 35(4), 538–546. <https://doi.org/10.1111/sum.12518>
- Bouma, J., Stoorvogel, J. J., Quiroz, R., Staal, S., Herrero, M., Immerzeel, W., Roetter, R. P., Van Den Bosch, H., Sterk, G., Rabbinge, R., & Chater, S.

- (2007). Ecoregional research for development. *Advances in Agronomy*, 93, 257–311. [https://doi.org/10.1016/S0065-2113\(06\)93005-3](https://doi.org/10.1016/S0065-2113(06)93005-3)
- Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative Research Journal*, 9(2), 27–40.
- Bradford, M. A., Carey, C. J., Atwood, L., Bossio, D., Fenichel, E. P., Gennet, S., Fargione, J., Fisher, J. R. B., Fuller, E., Kane, D. A., Lehmann, J., Oldfield, E. E., Ordway, E. M., Rudek, J., Sanderman, J., & Wood, S. A. (2019). Soil carbon science for policy and practice. *Nature Sustainability*, 2(12), 1070–1072. <https://doi.org/10.1038/s41893-019-0431-y>
- Bradshaw, C. J. A., Ehrlich, P. R., Beattie, A., Ceballos, G., Crist, E., Diamond, J., Dirzo, R., Ehrlich, A. H., Harte, J., Harte, M. E., Pyke, G., Raven, P. H., Ripple, W. J., Saltr e, F., Turnbull, C., Wackernagel, M., & Blumstein, D. T. (2021). Underestimating the challenges of avoiding a ghastly future. *Frontiers in Conservation Science*, 1, 1–10. <https://doi.org/10.3389/fcosc.2020.615419>
- Brand, F. (2009). Critical natural capital revisited: Ecological resilience and sustainable development. *Ecological Economics*, 68(3), 605–612. <https://doi.org/10.1016/j.ecolecon.2008.09.013>
- Brazeiro, A., Achkar, M., Toranza, C., & Bartesaghi, L. (2020). Agricultural expansion in Uruguayan grasslands and priority areas for vertebrate and woody plant conservation. *Ecology and Society*, 25(1). <https://doi.org/10.5751/ES-11360-250115>
- Breure, A. M., De Deyn, G. B., Dominati, E., Eglin, T., Hedlund, K., Van Orshoven, J., & Posthuma, L. (2012). Ecosystem services: A useful concept for soil policy making! *Current Opinion in Environmental Sustainability*, 4(5), 578–585. <https://doi.org/10.1016/j.cosust.2012.10.010>
- Breure, A. M., Groot, M., & Eijsackers, H. (2008). System-oriented ecotoxicological research: Which way to go? *Science of the total Environment*, 406(3), 530–536. <https://doi.org/10.1016/j.scitotenv.2008.06.052>
- Bridges, E. M., & Oldeman, L. R. (1999). Global assessment of human-induced soil degradation. *Arid Soil Research and Rehabilitation*, 13(4), 319–325. <https://doi.org/10.1080/089030699263212>
- Brundtland, G. H., & Khalid, M. (1987). *Our common future. Report of the World Commission on Environment and Development*. Oxford University Press.
- Bryman, A. (2012). *Social research methods* (4th edition). Oxford University Press.
- Bui, E. N., Hancock, G. J., Chappell, A., & Gregory, L.J. (2010). *Evaluation of tolerable erosion rates and time to critical topsoil loss in Australia*. CSIRO Publishing. <https://doi.org/10.25919/5c5c72283ff34>
- Buller, J., D nmez, P. E., Standring, A., & Wood, M. (2019). Introduction. In J. Buller, P. E. D nmez, A. Standring, & M. Wood (Eds.), *Comparing strategies of (de) politicisation in Europe: Governance, resistance and anti-politics* (pp. 1–24). Springer. Palgrave Macmillan.

- Burnham, P. (2001). New labour and the politics of dominance. *British Journal of Politics and International Relations*, 3(2), 127–149.
<https://doi.org/10.1057/9780230584372>
- Burnham, P. (2014). Depoliticisation: Economic crisis and political management. *Policy & Politics*, 42(2), 189–206.
- Burnham, P. (2017). Neo-liberalism, crisis and the contradictions of depoliticisation. *Partecipazione e Conflitto*, 10(2), 357–380.
- Buzan, B., Wæver, O., & De Wilde, J. (1998). *Security: A new framework for analysis*. Lynne Rienner Publishers.
- Byrne, J., Glover, L., & Alrøe, H. F. (2006). Globalization and sustainable development: A political ecology strategy to realize ecological justice. In H. F. Alrøe & M. T. Knudsen (Eds.), *Global development of organic agriculture: Challenges and prospects* (pp. 49–74). CABI Publishing.
<https://doi.org/10.1079/9781845930783.0049>
- Cafaro, P. (2017). Valuing Wild Nature. In S. Gardiner & A. Thompson (Eds.), *The Oxford Handbook of Environmental Ethics* (pp. 125–135). Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780199941339.001.0001>
- Cairney, P., & Zahariadis, N. (2016). Multiple streams approach: A flexible metaphor presents an opportunity to operationalize agenda setting processes. In N. Zahariadis (Ed.), *Handbook of Public Policy Agenda Setting* (pp. 87–105). Edward Elgar Publishing. <https://doi.org/10.4337/9781784715922>
- Callicott, J. B. (1979). Elements of an environmental ethic: Moral considerability and the biotic community. *Environmental Ethics*, 1(1), 71–81.
- Callicott, J. B. (1984). Non-anthropocentric value theory and environmental ethics. *American Philosophical Quarterly*, 21(4).
- Campbell, A. (2008). *Managing Australia's soils: A policy discussion paper prepared for the National Committee on Soil and Terrain through the Natural Resource Management Ministerial Council*. DAFF.
<https://www.researchgate.net/publication/236627347>
- Campbell, B. M., Beare, D. J., Bennett, E. M., Hall-Spencer, J. M., Ingram, J., Jaramillo, F., Ortiz, R., Ramankutty, N., Sayer, J. A., & Shindell, D. (2017). Agriculture production as a major driver of the Earth system exceeding planetary boundaries. *Ecology and Society*, 22(4). <https://doi.org/10.5751/ES-09595-220408>
- Campbell, C. (2009). Distinguishing the power of agency from agentic power: A note on Weber and the “black box” of personal agency. *Sociological Theory*, 27(4), 407–418. <https://doi.org/10.1111/j.1467-9558.2009.01355.x>
- Campbell, D. T. (1976). Assessing the impact of planned social change. *Evaluation and Program Planning*, 2(1), 67–90.

- Campbell, H. (2020). *Farming inside invisible worlds: Modernist agriculture and its consequences*. Bloomsbury Academic.
- Campbell, K. O. (1948). The development of soil conservation programmes in Australia. *Land Economics*, 24(1), 63. <https://doi.org/10.2307/3159501>
- Candel, J. J. L., Breeman, G. E., Stiller, S. J., & Termeer, C. J. A. M. (2014). Disentangling the consensus frame of food security: The case of the EU common agricultural policy reform debate. *Food Policy*, 44, 47–58. <https://doi.org/10.1016/j.foodpol.2013.10.005>
- Caplan, N. (1979). The two-communities theory and knowledge utilization. *American Behavioral Scientist*, 22(3), 459–470.
- Carey, J. (2016). Are we in the “Anthropocene”? *Proceedings of the National Academy of Sciences of the United States of America*, 113(15), 3908–3909. <https://doi.org/10.1073/pnas.1603152113>
- Carmen, E., Watt, A., & Young, J. (2018). Arguing for biodiversity in practice: A case study from the UK. *Biodiversity and Conservation*, 27(7), 1599–1617. <https://doi.org/10.1007/s10531-016-1264-x>
- Carter, N. (2003). *The politics of the environment: Ideas, activism, policy*. Cambridge University Press. <https://doi.org/10.18848/1833-1882/cgp/v05i11/51955>
- Castaño-Sánchez, J. P., Izaurrealde, R. C., & Prince, S. D. (2021). Land-use conversions from managed grasslands to croplands in Uruguay increase medium-term net carbon emissions to the atmosphere. *Journal of Land Use Science*, 16(3), 240–259. <https://doi.org/10.1080/1747423X.2021.1933227>
- Castree, N. (2014). The Anthropocene and the environmental humanities: Extending the conversation. *Environmental Humanities*, 5(1), 233–260. <https://doi.org/10.1215/22011919-3615496>
- Castree, N. (2019). The “Anthropocene” in global change science: Expertise, the Earth, and the future of humanity. In F. Biermann & E. Löwbrand (Eds.), *Anthropocene encounters: New directions in green political thinking* (pp. 25–49). Cambridge University Press. <https://doi.org/10.1017/9781108646673>
- Castree, N. (2021). Knowing what to know, what to do and how to do it in the Anthropocene. In F. J. Carrillo & G. Koch (Eds.), *Knowledge for the Anthropocene: A multidisciplinary approach* (pp. xiii–xv). Edward Elgar Publishing Limited. <https://dx.doi.org/10.4337/9781800884298>
- Ceballos, G., Ehrlich, P. R., & Dirzo, R. (2017). Biological annihilation via the ongoing sixth mass extinction signalled by vertebrate population losses and declines. *Proceedings of the National Academy of Sciences of the United States of America*, 114(30), E6089–E6096. <https://doi.org/10.1073/pnas.1704949114>
- Cedraz de Oliveira, A. (2017). Audit of soil governance. In H. Ginzky, I. Heuser, T. Qin, O. Ruppel, & P. Wegerdt (Eds.), *International Yearbook of Soil Law and Policy 2016* (pp. 9–14). Springer. <https://doi.org/10.1007/978-3-319-42508-5>

- Celermajer, D., & O'Brien, A. (2020). Transitional justice in multispecies worlds. *Contemporary Political Theory*, 19, 501–507.
- Celermajer, D., Schlosberg, D., Rickards, L., Stewart-Harawira, M., Thaler, M., Tschakert, P., Verlie, B., & Winter, C. (2021). Multispecies justice: Theories, challenges, and a research agenda for environmental politics. *Environmental Politics*, 30(1–2), 119–140. <https://doi.org/10.1080/09644016.2020.1827608>
- Chakrabarty, D. (2018). Anthropocene time. *History and Theory*, 57(1), 5–32. <https://doi.org/10.1111/HITH.12044>
- Chan, K. M. A., Balvanera, P., Benessaiah, K., Chapman, M., Díaz, S., Gómez-Baggethun, E., Gould, R., Hannahs, N., Jax, K., Klain, S., Luck, G., Martín-López, B., Muraca, B., Norton, B., Ott, K., Pascual, U., Satterfield, T., Tadaki, M., Taggart, J., & Turner, N. (2016). Opinion: Why protect nature? Rethinking values and the environment. *Proceedings of the National Academy of Sciences*, 113(6), 1462–1465. <https://doi.org/10.1073/pnas.1525002113>
- Chan, K. M. A., Gould, R. K., & Pascual, U. (2018). Editorial overview: Relational values: what are they, and what's the fuss about? *Current Opinion in Environmental Sustainability*, 35, A1–A7. <https://doi.org/10.1016/j.cosust.2018.11.003>
- Chan, K. M. A., Guerry, A. D., Balvanera, P., Klain, S., Satterfield, T., Basurto, X., Bostrom, A., Chuenpagdee, R., Gould, R., Halpern, B. S., Hannahs, N., Levine, J., Norton, B., Ruckelshaus, M., Russell, R., Tam, J., & Woodside, U. (2012). Where are cultural and social in ecosystem services? A framework for constructive engagement. *BioScience*, 62(8), 744–756. <https://doi.org/10.1525/bio.2012.62.8.7>
- Chapman, G., Gray, J. M., Murphy, B., Atkinson, G., Leys, J., Muller, R., Peasley, B., Wilson, B., Bowman, G., McInnes-Clarke, S. K., Tulau, M., Morand, D., & Yang, X. (2011). *Assessing the condition of soils in NSW*. OEH. <https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Land-and-soil/assessing-condition-soils-nsw.pdf>
- Charmaz, K. (2006). *Constructing Grounded Theory: A practical guide through qualitative analysis*. SAGE. <https://doi.org/10.1016/j.lisr.2007.11.003>
- Chasek, P., Safriel, U., Shikongo, S., & Fuhrman, V. (2015). Operationalizing Zero Net Land Degradation: The next stage in international efforts to combat desertification? *Journal of Arid Environments*, 112(PA), 5–13. <https://doi.org/10.1016/j.jaridenv.2014.05.020>
- Chemnitz, Ch., Weigelt, J., Bartz, D., Beste, A., Brent, Z., Dunbar, M., Ehlers, K., Feldt, H., Fuhr, L., Gerke, J., Green, A., Holdinghausen, H., Kotschi, J., Lal, R., Lymbery, Ph., Mathias, E., Montanarella, L., Mundy, P., Nolte, H., ... Wilson, J. (2015). *Soil Atlas: Facts and figures about earth, land and fields*. Heinrich-Böll-Stiftung & Institute for Advanced Sustainability Studies–Potsdam. https://www.boell.de/sites/default/files/soilatlas2015_ii.pdf

- Chen, C. (2016). *The return of ideology: The search for regime identities in Postcommunist Russia and China*. University of Michigan Press.
- Chen, Y. (2019). Withdrawal of European soil framework directive: Reasons and recommendations. *Journal of Sustainable Development*, 13(1), 1. <https://doi.org/10.5539/jsd.v13n1p1>
- Chertkovskaya, E., & Paulsson, A. (2016, February 16). *The Growthocene: Thinking through what degrowth is criticising*. Entitle blog – A collaborative writing project on political ecology. <https://entitleblogdotorg3.wordpress.com/2016/02/19/the-growthocene-thinking-through-what-degrowth-is-criticising/>
- Chong, D., & Druckman, J. N. (2007). Framing theory. *Annual Review of Political Science*, 10, 103–126. <https://doi.org/10.1146/annurev.polisci.10.072805.103054>
- Christoff, P. (2021, June 23). *Net zero by 2050? Even if Scott Morrison gets the Nationals on board, hold the applause*. The Conversation. <https://theconversation.com/net-zero-by-2050-even-if-scott-morrison-gets-the-nationals-on-board-hold-the-applause-163074>
- Churchman, C. W. (1967). Wicked problems [Guest Editorial]. *Management Science*, 14(4), 141–142. <https://doi.org/10.1366/000370209787169876>
- Clark, T. (2015). *Ecocriticism on the edge: The Anthropocene as a threshold concept*. Bloomsbury Publishing. <https://doi.org/10.5040/9781474217484>
- Clarke, R., Lamb, R., & Ward, D. R. (2002). Integrating environment and development: 1997-2002. *Global environment outlook 3: past, present and future perspectives* (pp. 1–28). UNEP, Earthscan. <https://wedocs.unep.org/handle/20.500.11822/8609>
- Clegg, S. (1989). *Frameworks of power*. SAGE.
- Clegg, S. (2010). The state, power, and agency: Missing in action in institutional theory? *Journal of Management Inquiry*, 19(1), 4–13. <https://doi.org/10.1177/1056492609347562>
- Clegg, S., & Haugaard, M. (2009a). Introduction: Why power is the central concept of the social sciences. In S. Clegg & M. Haugaard (Eds.), *The Sage Handbook of Power* (pp. 1–24). SAGE.
- Clegg, S., & Haugaard, M. (2009b). Discourse and Power. In S. Clegg & M. Haugaard (Eds.), *The Sage Handbook of Power* (pp. 400–465). SAGE.
- Clérici, C., & García Préchac, F. (2001). Aplicaciones del modelo USLE/RUSLE para estimar pérdidas de suelo por erosión en Uruguay y la región sur de la cuenca del Río de la Plata. *Agrociencia*, v(1), 92–103.
- Clune, D., & Smith, R. (2019). New South Wales. In P. J. Chen, N. Barry, J. R. Butcher, D. Clune, I. Cook, A. Garnier, Y. Haigh, S. C. Motta, & M. Taflaga (Eds.), *Australian Politics and Policy* (pp. 212–232). Sydney University Press. <https://dx.doi.org/10.30722/sup.9781743328415>

- Cobb, R. W., & Elder, Ch. (1971). The politics of agenda-building: An alternative perspective for modern democratic theory. *The Journal of Politics*, 33(4), 892–915.
- Coffey, B. (2019). Environmental policy. In P. J. Chen, N. Barry, J. R. Butcher, D. Clune, I. Cook, A. Garnier, Y. Haigh, S. C. Motta, & M. Taflaga (Eds.), *Australian Politics and Policy* (pp. 559–579). Sydney University Press. <https://dx.doi.org/10.30722/sup.9781743328415>
- Cohen, G. A. (1989). On the currency of egalitarian justice. *Ethics*, 99(4), 906–944.
- Comberti, C., Thornton, T. F., de Echeverria, V. W., & Patterson, T. (2015). Ecosystem services or services to ecosystems? Valuing cultivation and reciprocal relationships between humans and ecosystems. *Global Environmental Change*, 34, 247–262. <https://doi.org/10.1016/j.gloenvcha.2015.07.007>
- Connolly, W. E. (1995). *The ethos of pluralization*. University of Minnesota Press.
- Contandriopoulos, D., Lemire, M., Denis, J. L., & Tremblay, E. (2010). Knowledge exchange process in organizations and policy arenas: a narrative systematic review of the literature. *The Milbank Quarterly*, 88(4), 444–483. <https://doi.org/10.1111/j.1468-0009.2010.00608.x>
- Cooke, B., & Moon, K. (2015). Aligning “public good” environmental stewardship with the landscape-scale: Adapting MBIs for private land conservation policy. *Ecological Economics*, 114, 152–158. <https://doi.org/10.1016/j.ecolecon.2015.03.027>
- Cork, S., Eadie, L., Mele, P. M., Price, R., & Yule, D. (2012). *The relationships between land management practices and soil condition and the quality of ecosystem services delivered from agricultural land in Australia*. Kiri-ganai Research Pty Ltd. <https://www.agriculture.gov.au/sites/default/files/sitecollectiondocuments/natural-resources/soils-chp1-5.pdf>
- Cornell, S. (2011). The rise and rise of ecosystem services: Is “value” the best bridging concept between society and the natural world? *Procedia Environmental Sciences*, 6, 88–95. <https://doi.org/10.1016/j.proenv.2011.05.009>
- Costanza, R., & Daly, H. E. (1992). Natural capital and sustainable development. *Conservation Biology*, 6(1), 37–46.
- Costanza, R., D’Arge, R., De Groot, R., Farber, S., Grasso, M., Hannon, B., Limburg, K., Naeem, Sh., O’Neill, R., Paruelo, J., Raskin, R., Sutton, P., & Van Den Belt, M. (1997). The value of the world’s ecosystem services and natural capital. *Nature*, 387(6630), 253–260. <https://doi.org/10.1038/387253a0>
- Cresswell, J. W. (2007). *Qualitative inquiry and research design: Choosing among five traditions* (2nd Edition). SAGE.
- Creutzig, F. (2017). Govern land as a global commons. *Nature*, 546(7656), 28–29. <https://doi.org/10.1038/546028a>

- Crist, E. (2013). On the poverty of our nomenclature. *Environmental Humanities*, 3(1), 129–147. <https://doi.org/10.1215/22011919-3611266>
- Crist, E. (2015). The reaches of freedom: A response to an ecomodernist manifesto. *Environmental Humanities*, 7, 245–254. <https://doi.org/10.1215/22011919-3616452>
- Cross, R., & Ampt, P. (2017). Exploring agroecological sustainability: Unearthing innovators and documenting a community of practice in southeast Australia. *Society and Natural Resources*, 30(5), 585–600. <https://doi.org/10.1080/08941920.2016.1230915>
- Crouch, C. (2004). *Post-democracy*. Polity.
- Crouch, C. (2016). The march towards post-democracy, ten years on. *Political Quarterly*, 87(1), 71–75. <https://doi.org/10.1111/1467-923X.12210>
- Crowley, K., & Walker, K. J. (Eds.) (2012). *Environmental policy failure: The Australian story*. Tilde University Pres. <https://doi.org/10.13140/2.1.2934.2089>
- Crutzen, P. (2002). Geology of mankind. *Nature*, 415(6867), 23. <https://doi.org/10.1038/415023a>
- Crutzen, P., & Stoermer, E. (2000). The Anthropocene. *Global Change Newsletter*, 41, 17–18. <https://doi.org/10.1016/B978-0-12-409548-9.10614-1>
- D'Agnesse, V. (2015). 'And they lived happily ever after': The fairy tale of radical constructivism and Von Glasersfeld's ethical disengagement. *Ethics and Education*, 10(2), 131–151. <https://doi.org/10.1080/17449642.2014.999425>
- Dahl, R. A. (1957). The concept of power. *Behavioral Science*, 2(3), 201–215.
- Daily, G. (Ed.) (1997). *Nature's services. Societal dependence on natural ecosystems*. Island Press.
- Daily, G., Matson, P., & Vitousek, P. (1997). Ecosystem services supplied by soil. In G. Daily (Ed.), *Nature's services: Societal dependence on natural ecosystems* (pp. 113–132). Island Press.
- Darré, E., Cadenazzi, M., Mazzilli, S. R., Rosas, J. F., & Picasso, V. D. (2019). Environmental impacts on water resources from summer crops in rainfed and irrigated systems. *Journal of Environmental Management*, 232, 514–522. <https://doi.org/10.1016/j.jenvman.2018.11.090>
- David, L. (2019). *How term limits constrain the emergence of agency and resilience* [Working paper]. IDEAS Working Paper Series from RePEc. http://wp.circle.lu.se/upload/CIRCLE/workingpapers/201904_david.pdf
- Davies, J. (2017). The business case for soil. *Nature*, 543(7645), 309–311. <https://doi.org/10.1038/543309a>
- Davis, C. B., & Lewicki, R. J. (2003). Environmental conflict resolution: Framing and intractability: An introduction. *Environmental Practice*, 5(3), 200–206. <https://doi.org/10.1017/S1466046603035580>

- Davison, N. (2019, May 30). *The Anthropocene epoch: Have we entered a new phase of planetary history?* The Guardian. <https://www.theguardian.com/science/audio/2019/jun/10/the-anthropocene-epoch-have-we-entered-a-new-phase-of-planetary-history>
- De Groot, R., Wilson, M., & Boumans, R. (2002). A typology for the classification, description and valuation of ecosystem functions, goods and services. *Ecological Economics*, 41(3), 393–408. [https://doi.org/10.1016/S0921-8009\(02\)00089-7](https://doi.org/10.1016/S0921-8009(02)00089-7)
- De Leon, P. (1990). Participatory policy analysis: Prescriptions and precautions. *Asian Journal of Public Administration*, 12(1), 29–54.
- De Leon, P. (1992). The democratization of the policy sciences. *Public Administration Review*, 125–129.
- Deakin, H., & Wakefield, K. (2014). Skype interviewing: Reflections of two PhD researchers. *Qualitative Research*, 14(5), 603–616. <https://doi.org/10.1177/1468794113488126>
- Death, C. (2014). Critical, environmental, political: An introduction. In C. Death (Ed.), *Critical environmental politics* (pp. 1–12). Routledge.
- DeLong, C., Cruse, R., & Wiener, J. (2015). The soil degradation paradox: Compromising our resources when we need them the most. *Sustainability*, 7(1), 866–879. <https://doi.org/10.3390/su7010866>
- Denzin, N. K. (2009). The elephant in the living room: Or extending the conversation about the politics of evidence. *Qualitative Research*, 9(2), 139–160. <https://doi.org/10.1177/1468794108098034>
- Denzin, N. K., & Lincoln, Y. S. (2005). *The SAGE handbook of qualitative research* (3rd ed.). SAGE.
- Denzin, N. K., & Lincoln, Y. S. (2017). Introduction: The Discipline and Practice of Qualitative Research. In N. K. Denzin & Y. S. Lincoln (Eds.), *The Sage Handbook of Qualitative Research*. SAGE.
- Department of Natural Resources and Environment Tasmania. (2022). *Soil condition*. Retrieved 15 March, 2022, from <https://nre.tas.gov.au/agriculture/land-management-and-soils/land-and-soil-resource-assessment/soil-condition>
- Dery, D. (1984). *Problem definition in policy analysis*. University Press of Kansas.
- Deubel, A. (2007). Análisis de las políticas públicas: de la pertinencia de una perspectiva basada en el anarquismo epistemológico. *Ciencia Política*, (3), 6–29.
- Dewulf, A., & Bouwen, R. (2012). Issue Framing in Conversations for Change: Discursive Interaction Strategies for “Doing Differences.” *Journal of Applied Behavioral Science*, 48(2), 168–193. <https://doi.org/10.1177/0021886312438858>

- Dewulf, A., Gray, B., Putnam, L., Lewicki, R., Aarts, N., Bouwen, R., & Van Woerkum, C. (2009). Disentangling approaches to framing in conflict and negotiation research: A meta-paradigmatic perspective. In *Human Relations* (Vol. 62, Issue 2). <https://doi.org/10.1177/0018726708100356>
- Diamond, J. (2005). *Collapse: how societies choose to fail or succeed*. Viking Penguin.
- Díaz, S., Pascual, U., Stenseke, M., Martín-López, B., Watson, R. T., Molnár, Z., Hill, R., Chan, K. M. A., Baste, I. A., Brauman, K. A., Polasky, S., Church, A., Lonsdale, M., Larigauderie, A., Leadley, P. W., van Oudenhoven, A. P. E., van der Plaats, F., Schröter, M., Lavorel, S., ... Shirayama, Y. (2018). Assessing nature's contributions to people. *Science*, 359(6373), 270–272. <https://doi.org/10.1126/science.aap8826>
- Díaz, S., Settele, J., Brondízio, E. S., Ngo, H. T., Guèze, M., Agard, J., Arneth, P., Balvanera, P., Brauman, K. A., Butchart, S. H. M., Chan, K. M. A., Garibaldi, L. A., Ichii, K., Liu, J., Subramanian, S. M., Midgley, G. F., Miloslavich, P., Molnár, Z., Obura, D., ... Zayas, C. N. (2019). *Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*. IPBES. <https://doi.org/10.5281/zenodo.3553459>
- DIEA-MGAP. (2011). *Censo General Agropecuario 2011. Resultados Definitivos*. Retrieved 20 February, 2022, from <https://www.gub.uy/ministerio-ganaderia-agricultura-pesca/sites/ministerio-ganaderia-agricultura-pesca/files/2020-02/censo2011.pdf>
- Dobson, A. (1998). *Justice and the Environment. Conceptions of Environmental Sustainability and Theories of Distributive Justice*. Oxford University Press.
- Dobson, A. (2014). *Listening for democracy: Recognition, representation, reconciliation*. Oxford University Press.
- Dominati, E., Patterson, M., & Mackay, A. (2010). A framework for classifying and quantifying the natural capital and ecosystem services of soils. *Ecological Economics*, 69(9), 1858–1868. <https://doi.org/10.1016/j.ecolecon.2010.05.002>
- Dovers, S. (1996). Sustainability: Demands on Policy. *Journal of Public Policy*, 16(3), 303–318. <https://doi.org/10.1017/S0143814X00007789>
- Dowding, K. (2008). Agency and structure: Interpreting power relationships. *Journal of Power*, 1(1), 21–36. <https://doi.org/10.1080/17540290801943380>
- Druckman, J. N. (2001). The implications of framing effects for citizen competence. *Political Behavior*, 23(3), 225–256.
- Dryzek, J. (1990). *Discursive democracy: politics, policy, and political science*. Cambridge University Press.
- Dryzek, J. (2013). *The politics of the Earth: Environmental discourses* (3rd ed.). Oxford University Press.

- Dryzek, J., & Niemeyer, S. (2008). Discursive representation. *American Political Science Review*, 102(4), 481–493. <https://doi.org/10.1017/S0003055408080325>
- Dryzek, J., & Pickering, J. (2019). *The politics of the Anthropocene*. Oxford University Press.
- Duit, A., Feindt, P. H., & Meadowcroft, J. (2016). Greening Leviathan: The rise of the environmental state? *Environmental Politics*, 25(1), 1–23. <https://doi.org/10.1080/09644016.2015.1085218>
- Dunn, W. N. (1988). Methods of the second type: Coping with the wilderness of conventional policy analysis. *Review of Policy Research*, 7(4), 720–737.
- Durning, D. (1993). Participatory policy analysis in a social service agency: A case study. *Journal of Policy Analysis and Management*, 12(2), 297–322.
- Durning, D. (1999). The transition from traditional to postpositivist policy analysis: A role for Q methodology. *Journal of Policy Analysis and Management*, 18(3), 389–410.
- Dworkin, R. (2002). *Sovereign virtue: The theory and practice of equality*. Harvard University Press.
- Dye, Th. (1972). *Understanding public policy*. Englewood Cliffs: Prentice- Hall.
- Ehlers, K. (2017). Chances and challenges in using the sustainable development goals as a new instrument for global action against soil degradation. In H. Ginzky, I. Heuser, T. Markus, E. Dooley, & E. Kasimbazi (Eds.), *International Yearbook of Soil Law and Policy 2016*. Springer. <https://doi.org/10.1007/978-3-319-42508-5>
- Elder, C. D., & Cobb, R. W. (1983). *The political uses of symbols*. Longman Publishing Group.
- Ellis, E. C. (2011). Anthropogenic transformation of the terrestrial biosphere. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, 369(1938), 1010–1035. <https://doi.org/10.1098/rsta.2010.0331>
- Ellis, S., & Mellor, A. (1995). *Soils and environment*. Taylor & Francis US.
- Engel-Di Mauro, S. (2014). *Ecology, soils, and the left: An ecosocial approach*. Springer.
- Engel-Di Mauro, S., & Van Sant, L. (2020). Soils and commodification. In J. F. Salazar, C. Granjou, M. Kearnes, A. Krzywoszynska, & M. Tironi (Eds.), *Thinking with soils: Material politics and social theory* (pp. 55–88). Bloomsbury Publishing. <https://doi.org/10.5040/9781350109568.ch-004>
- Enserink, B., Koppenjan, J., & Mayer, I. (2013). A policy sciences view on policy analysis. In W. A. H. Thissen & W. E. Walker (Eds.), *Public policy analysis*, 179, pp. 11–41. Springer. <https://doi.org/10.1007/978-1-4614-4602-6>

- Entman, R. M. (1993). Framing: Toward clarification of a fractured paradigm. *Journal of Communication*, 43(4), 51–58. <https://doi.org/10.1111/j.1460-2466.1993.tb01304.x>
- Ernstson, H., & Sörlin, S. (2013). Ecosystem services as technology of globalization: On articulating values in urban nature. *Ecological Economics*, 86, 274–284. <https://doi.org/10.1016/j.ecolecon.2012.09.012>
- Etikan, I. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics*, 5(1), 1–4. <https://doi.org/10.11648/j.ajtas.20160501.11>
- European Commission. (2006a). *Proposal for a Directive of the European Parliament and of the Council establishing a framework for the protection of soil*. <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52006PC0232&from=en>
- European Commission. (2006b). *Soil protection. The story behind the strategy*. <https://ec.europa.eu/environment/archives/soil/pdf/soillight.pdf>
- Evans, D. L., Quinton, J. N., Davies, J. A. C., Zhao, J., & Govers, G. (2020). Soil lifespans and how they can be extended by land use and management change. *Environmental Research Letters*, 15(9). <https://doi.org/10.1088/1748-9326/aba2fd>
- Fairhead, J., Leach, M., & Scoones, I. (2012). Green grabbing: A new appropriation of nature? *Journal of Peasant Studies*, 39(2), 237–261. <https://doi.org/10.1080/03066150.2012.671770>
- Falk, R. A. (1998). *Law in an emerging global village: A post-Westphalian perspective*. Transnational Publishers.
- Fawcett, P., Flinders, M. V., Hay, C., & Wood, M. (2017). Anti-politics, depoliticization, and governance. In P. Fawcett, M. V. Flinders, C. Hay, & M. Wood (Eds.), *Anti-politics, Depoliticization, and Governance* (pp. 3–27). Oxford University Press.
- Fawcett, P., & Marsh, D. (2014). Depoliticisation, governance and political participation. *Policy & Politics*, 42(2), 171–188.
- Fawcett, P., & Wood, M. (2017). Depoliticization, meta-governance, and coal seam gas regulation in New South Wales. In P. Fawcett, M. Flinders, C. Hay, & M. Wood (Eds.), *Anti-politics, Depoliticization, and Governance* (pp. 217–242). Oxford University Press.
- Ferguson, H., & Northern Rivers Landed Histories Research Group. (2016). More than something to hold the plants up: Soil as a non-human ally in the struggle for food justice. *Local Environment*, 21(8), 956–968. <https://doi.org/10.1080/13549839.2015.1050659>
- Field, D. J., Yates, D., Koppi, A., McBratney, A., & Jarrett, L. E. (2017). Framing a modern context of soil science learning and teaching. *Geoderma*, 289, 117–123. <https://doi.org/10.1016/j.geoderma.2016.11.034>

- Finnemore, M., & Sikkink, K. (2001). Taking stock: The constructivist research program in international relations and comparative politics. *Annual Review Political Science*, 4, 391–416. <https://doi.org/10.1146/annurev.polisci.4.1.391>
- Fischer, F. (1990). *Technocracy and the politics of expertise*. SAGE.
- Fischer, F. (1998). Beyond empiricism: Policy inquiry in post positivist perspective. *Policy Studies Journal*, 26(1), 129–146.
- Fischer, F., & Forester, J. (1993). *The argumentative turn in policy analysis and planning*. Duke University Press.
- Fischer, F., & Gottweis, H. (2012). *The argumentative turn revisited. Public policy as communicative practice*. Duke University Press, Durham & London.
- Fischhendler, I., & Katz, D. (2013). The use of “security” jargon in sustainable development discourse: Evidence from UN Commission on Sustainable Development. *International Environmental Agreements: Politics, Law and Economics*, 13(3), 321–342. <https://doi.org/10.1007/s10784-012-9192-z>
- Flasbarth, J. (2017). Soils need international governance: A European perspective for the first volume of the International Yearbook of Soil Law and Policy. In H. Ginzky, I. Heuser, T. Qin, O. Ruppel, & P. Wegerdt (Eds.), *International Yearbook of Soil Law and Policy 2016* (pp. 15–19). Springer. <https://doi.org/10.1007/978-3-319-42508-5>
- Fletcher, A. L. (2009). Clearing the air: The contribution of frame analysis to understanding climate policy in the United States. *Environmental Politics*, 18(5), 800–816. <https://doi.org/10.1080/09644010903157123>
- Flick, U. (1992). Triangulation revisited: Strategy of validation or alternative? *Journal for the Theory of Social Behaviour*, 22(2), 175–197.
- Flinders, M., & Buller, J. (2006). Depoliticisation: Principles, tactics and tools. *British Politics*, 1(3), 293–318. <https://doi.org/10.1057/palgrave.bp.4200016>
- Flyvbjerg, B. (2011). Case study. In N. K. Denzin & Y. S. Lincoln (Eds.), *The Sage handbook of qualitative research*, (4th ed.) (pp. 301–316). SAGE.
- Foley, J. A., DeFries, R., Asner, G. P., Barford, C., Bonan, G., Carpenter, S. R., Chapin, F. S., Coe, M. T., Daily, G. C., Gibbs, H. K., Helkowski, J. H., Holloway, T., Howard, E. A., Kucharik, C. J., Monfreda, C., Patz, J. A., Prentice, I. C., Ramankutty, N., & Snyder, P. K. (2005). Global consequences of land use. *Science*, 309(5734), 570–574. <https://doi.org/10.1126/science.1111772>
- Food and Agriculture Organization of the United Nations. (1995). Planning for sustainable use of land resources. Towards a new approach. *FAO Land and Water Bulletin*, 2, 1-68. http://www.faoswalim.org/resources/Land/Land_resource_Mgt/pdfdocs/lwbull2.pdf

- Food and Agriculture Organization of the United Nations. (2015a). *International Year of Soil Conference*. 2015 International Year of Soils: Healthy soils for healthy life. <http://www.fao.org/soils-2015/events/detail/en/c/338738/>
- Food and Agriculture Organization of the United Nations. (2015b). *Revised World Soil Charter*. <https://www.fao.org/documents/card/en/c/e60df30b-0269-4247-a15f-db564161fee0/>
- Food and Agriculture Organization of the United Nations. (2021a). *Soil Degradation*. FAO Soils Portal. <http://www.fao.org/soils-portal/soil-degradation-restoration/it/>
- Food and Agriculture Organization of the United Nations. (2021b). *Soil Governance*. Global Soil Partnership. <http://www.fao.org/global-soil-partnership/areas-of-work/soil-governance/en/>
- Food and Agriculture Organisation of the United Nations, Intergovernmental Technical Panel on Soils, Global Soil Biodiversity Initiative, Secretariat of the Convention of Biological Diversity, & European Commission. (2020). *State of knowledge of soil biodiversity – Status, challenges and potentialities, Summary for policy makers*. FAO. <https://doi.org/10.4060/cb1929en>
- Food and Agriculture Organization of the United Nations & Intergovernmental Technical Panel on Soils. (2015). *Status of the World's Soil Resources. Main Report*. FAO. <https://www.fao.org/3/i5199e/i5199e.pdf>
- Foucault, M. (1978). *The history of sexuality. Volume 1: An Introduction*. Pantheon Books.
- Foucault, M. (1980). *Power/Knowledge: Selected interviews and other writings*. Harvester Press.
- Foucault, M. (1989). The concern for truth. In S. Lotringer (Ed.), *Foucault Live: Collected Interviews 1961-1984* (pp. 455-464). Semiotext(e).
- Foucault, M. (2019). *Ethics: subjectivity and truth: essential works of Michel Foucault 1954-1984*. Penguin UK.
- Francis, P. (2015). *Laudato si'*. Vatican Press. https://www.vatican.va/content/dam/francesco/pdf/encyclicals/documents/papa-francesco_20150524_enciclica-laudato-si_en.pdf
- Fraser, N. (1997). *Justice interruptus: Critical reflections on the "postsocialist" condition*. Routledge.
- Fraser, N. (2009). *Scales of justice: Reimagining political space in a globalizing world: Vol. 31*. Columbia University Press.
- Freeman, K., Dias Pereira, L., & Bullor, L. (2021). *Up-skilling human capital for value-chain competitiveness in Uruguay*. Food and Agriculture Organization, World Bank. <https://doi.org/10.4060/cb7019en>
- Fremaux, A., & Barry, J. (2019). The "Good Anthropocene" and green political theory: Rethinking environmentalism, resisting eco-modernism. In F.

- Biermann & E. Löwbrand (Eds.), *Anthropocene encounters: New directions in green political thinking* (pp. 171–190). Cambridge University Press.
<https://doi.org/10.1017/9781108646673>
- Fromherz, N. (2012). The case for a global treaty on soil conservation, sustainable farming, and the preservation of agrarian culture. *Ecology Law Quarterly*, 39(1), 57–121. <https://doi.org/10.15779/Z38BC49>
- Fuchs, D., & Lederer, M. M. (2007). The power of business. *Business and Politics*, 9(3), 1–17. <https://doi.org/10.2202/1469-3569.1214>
- Fukuyama, F. (1992). *The end of history and the last man*. The Free Press.
- Funtowicz, S. O., & Ravetz, J. R. (1993). Science for the post-normal age. *Futures*, 25(7), 739–755. [https://doi.org/10.1016/0016-3287\(93\)90022-L](https://doi.org/10.1016/0016-3287(93)90022-L)
- Gamble, A. (2021). *The western ideology and other essays*. Bristol University Press.
<https://doi.org/10.2307/j.ctv1mcpmjw.8>
- Gamble, C. N., Hanan, J. S., & Nail, T. (2019). What Is New Materialism? *Angelaki - Journal of the Theoretical Humanities*, 24(6), 111–134.
<https://doi.org/10.1080/0969725X.2019.1684704>
- Gao, X., Xu, W., Hou, Y., & Ouyang, Z. (2020). Market-based instruments for ecosystem services: Framework and case study in Lishui City, China. *Ecosystem Health and Sustainability*, 6(1), 1835445–.
<https://doi.org/10.1080/20964129.2020.1835445>
- Garaycochea, S., Romero, H., Beyhaut, E., Neal, A. L., & Altier, N. (2020). Soil structure, nutrient status and water holding capacity shape Uruguayan grassland prokaryotic communities. *FEMS Microbiology Ecology*, 96(12), 207–.
<https://doi.org/10.1093/femsec/fiaa207>
- García Préchac, F., Clérici, C., & Terra, J. A. (1999, November 8–12). *Avances con USLE-RUSLE para estimar erosión y pérdidas de productividad en Uruguay* [Paper presentation]. 14th Latin American Congress of Soil Science, Pucon, Chile.
- García Préchac, F., Ernst, O., Arbeletche, P., Pérez Bidegain, M., Pritsch, C., Ferenczi, A., & Rivas, M. (2010). *Intensificación de la agricultura en Uruguay: Oportunidades y amenazas para un país productivo y natural*. Espacio Interdisciplinario, Universidad de la República, Uruguay.
https://www.researchgate.net/publication/303750742_Intensificacion_Agricola_la_oportunidades_y_amenazas_para_un_pais_productivo_y_natural
- García Préchac, F., Ernst, O., Siri Prieto, G., & Terra, J. A. (2004). Integrating no-till into crop-pasture rotations in Uruguay. *Soil and Tillage Research*, 77(1), pp. 1–13. <https://doi.org/10.1016/j.still.2003.12.002>
- García Préchac, F., Terra, J., & Clérici, C. (1998, November 4–6). Validación del factor uso y manejo del suelo (C) de la RUSLE en Uruguay [Paper presentation]. 2nd Reuniao Sul Brasileira de La Ciencia Do Solo, Santa Maria, Rio Grande do Sul, Brazil. Retrieved 2 February, 2022, from

https://www.researchgate.net/publication/264157889_Validacion_del_factor_uso_y_manejo_del_suelo_C_de_la_RUSLE_en_Uruguay?channel=doi&linkId=53d6a25c0cf220632f3dc41a&showFulltext=true

- García Préchac, F., Terra, J., Sawchik, J., & Pérez Bidegain, M. (2017). Mejora de las estimaciones con USLE/RUSLE empleando resultados de parcelas de escurrimiento para considerar el efecto del agua del suelo. *Agrociencia Uruguay*, 21(2), 100–104.
- Garner, R. (2013). *A theory of justice for animals: Animal rights in a nonideal world*. Oxford University Press.
<https://doi.org/10.1093/acprof:oso/9780199936311.001.0001>
- Gaventa, J. (2006). Finding the spaces for change: A power analysis. *IDS Bulletin*, 37(6), 23–33. <https://doi.org/10.1111/j.1759-5436.2006.tb00320.x>
- Gazzano, I., Achkar, M., & Díaz, I. (2019). Agricultural transformations in the southern cone of Latin America: Agricultural intensification and decrease of the aboveground net primary production, Uruguay's case. *Sustainability (Switzerland)*, 11(24), 7011–. <https://doi.org/10.3390/su11247011>
- Geertz, C. (1973). *The interpretation of cultures: Selected essays*. Basic Books.
- GEOUruguay. (2008). *GEO Uruguay: Informe del Estado del Ambiente*. United Nations Environment Programme.
<https://www.unep.org/resources/report/informe-del-estado-del-ambiente-geo-uruguay>
- Gerbens-Leenes, P. W., & Nonhebel, S. (2002). Consumption patterns and their effects on land required for food. *Ecological Economics*, 42(1), 185–199.
[https://doi.org/10.1016/S0921-8009\(02\)00049-6](https://doi.org/10.1016/S0921-8009(02)00049-6)
- German Advisory Council on Global Change. (1994). *World in transition: The threat to soils*. Economica Verlag GmbH.
- Gibbs, H. K., & Salmon, J. M. (2015). Mapping the world's degraded lands. *Applied Geography*, 57, 12–21. <https://doi.org/10.1016/j.apgeog.2014.11.024>
- Giddens, A. (1984). *The constitution of society: Outline of the theory of structuration*. Polity Press.
- Giddens, A. (1987). *Social theory and modern sociology*. Polity Press.
- Giddens, A. (1994). *Beyond Left and Right: The future of radical politics*. Polity Press.
- Ginzky, H., Heuser, I., Markus, T., Dooley, E., & Kasimbazi, E. (2017). *International Yearbook of Soil Law and Policy 2016*. Springer.
<https://doi.org/10.1007/978-3-319-42508-5>
- Glaser, B., & Birk, J. J. (2012). State of the scientific knowledge on properties and genesis of Anthropogenic dark earths in Central Amazonia (terra preta de Índio). *Geochimica et Cosmochimica Acta*, 82, 39–51.
<https://doi.org/10.1016/j.gca.2010.11.029>

- Glaser, B., & Strauss, A. (1967). *The discovery of Grounded Theory: Strategies for qualitative research*. Aldine Pub. Co.
- Gliessman, S., & Rosemeyer, M. E. (2010). *The conversion to sustainable agriculture: Principles, processes, and practices*. CRC Press/Taylor & Francis Group. <https://doi.org/10.1201/9781420003598>
- Global Soil Forum. (2015). *Knowledge for change. Our thematic priorities*. Institute for Advanced Sustainability Studies–Potsdam. https://www.iass-potsdam.de/sites/default/files/files/globalsoilforum_knowledge_for_change.pdf
- Global Soil Partnership. (2011). *Global Soil Partnership background paper*. https://www.fao.org/fileadmin/user_upload/GSP/docs/WS_managinglivings_oils/GSP_Background_Paper.pdf
- Gluckman, P. D., Bardsley, A., & Kaiser, M. (2021). Brokerage at the science–policy interface: from conceptual framework to practical guidance. *Humanities and Social Sciences Communications*, 8(1), 1–10. <https://doi.org/10.1057/s41599-021-00756-3>
- Göhler, G. (2009). “Power to” and “Power over.” In S. R. Clegg & M. Haugaard (Eds.), *The Sage Handbook of Power* (pp. 27–39). SAGE.
- Gómez-Baggethun, E., & Muradian, R. (2015). In markets we trust? Setting the boundaries of Market-Based Instruments in ecosystem services governance. *Ecological Economics*, 117, 217–224. <https://doi.org/10.1016/j.ecolecon.2015.03.016>
- Gómez-Baggethun, E., & Ruiz-Pérez, M. (2011). Economic valuation and the commodification of ecosystem services. *Progress in Physical Geography*, 35(5), 613–628. <https://doi.org/10.1177/0309133311421708>
- Gomiero, T. (2016). Soil degradation, land scarcity and food security: Reviewing a complex challenge. *Sustainability*, 8(3), 1–41. <https://doi.org/10.3390/su8030281>
- Gonzalez Lago, M. (2020). La securitización ambiental como dispositivo retórico. El caso del suelo. *Diálogo Político*, 1(2020), 104–111. <https://revista.dialogopolitico.org/wp-content/uploads/2020/05/10-Gonzalez.pdf>
- Gonzalez Lago, M., Plant, R., & Jacobs, B. (2019). Re-politicising soils: What is the role of soil framings in setting the agenda? *Geoderma*, 349, 97–106. <https://doi.org/10.1016/j.geoderma.2019.04.021>
- Gordon, R. (2009). Power and Legitimacy. In S. Clegg & M. Haugaard (Eds.), *The Sage Handbook of Power* (pp. 256–273). SAGE.
- Görg, C., Wittmer, H., Carter, C., Turnhout, E., Vandewalle, M., Schindler, S., Livorell, B., & Lux, A. (2016). Governance options for science–policy interfaces on biodiversity and ecosystem services: comparing a network

- versus a platform approach. *Biodiversity and Conservation*, 25(7), 1235–1252. <https://doi.org/10.1007/s10531-016-1132-8>
- Gottweis, H. (2003). Theoretical strategies of poststructuralist policy analysis: Towards analytics of government. In M. Hajer & H. Wagenaar (Eds.), *Deliberative policy analysis: Understanding governance in the network society* (pp. 247–265). Cambridge University Press.
- Goyenola, G., Kruk, C., Mazzeo, N., Nario, A., Perdomo, C., Piccini, C., & Meerhoff, M. (2021). Producción, nutrientes, eutrofización y cianobacterias en Uruguay: armando el rompecabezas. *INNOTECH*, 22. <https://doi.org/10.26461/22.02>
- Granjou, C., & Salazar, J. F. (2019). The stuff of soil. *Nature and Culture*, 14(1), 39–60. <https://doi.org/10.3167/nc.2019.140103>
- Grêt-Regamey, A., Sirén, E., Brunner, S. H., & Weibel, B. (2017). Review of decision support tools to operationalize the ecosystem services concept. *Ecosystem Services*, 26, 306–315. <https://doi.org/10.1016/j.ecoser.2016.10.012>
- Grunwald, S., Mizuta, K., Ceddia, M., Pinheiro, E., Kastner Wilcox, R., Gavilan, C., Wade, R., & Clingensmith, Ch. (2017). The meta soil model: An integrative multi-model framework for Soil Security. In D. J. Field, C. L. Morgan, & A. B. McBratney (Eds.), *Global Soil Security* (pp. 305–317). Springer. <https://doi.org/10.1007/978-3-319-43394-3>
- Gudynas, E. (2011). Más allá del nuevo extractivismo: transiciones sostenibles y alternativas al desarrollo. In F. Wanderley (Ed.), *El desarrollo en cuestión. Reflexiones desde América Latina* (pp. 379–410). CIDES-UMSA, OXFAM. https://www.iisec.ucb.edu.bo/assets/iisec/publicacion/Desarrollo_en_cuestion.pdf
- Gudynas, E. (2016a). Natural resource nationalisms and the compensatory state in progressive South America. In P. A. Haslam & P. Heidrich (Eds.), *The political economy of natural resources and development: From neoliberalism to resource nationalism*. Taylor & Francis Group.
- Gudynas, E. (2016b). Beyond varieties of development: Disputes and alternatives. *Third World Quarterly*, 37(4), 721–732. <https://doi.org/10.1080/01436597.2015.1126504>
- Gudynas, E. (2018). Extractivisms: tendencies and consequences. In R. Munck & R. Delgado Wise (Eds.), *Reframing Latin American Development* (pp. 61–76). Routledge.
- Gusfield, J. R. (1984). *The culture of public problems: Drinking-driving and the symbolic order*. University of Chicago Press.
- Hajer, M. (1995). *The politics of environmental discourse. Ecological Modernization and the Policy Process*. Clarendon Press.

- Hajkovicz, S. (2009). The evolution of Australia's natural resource management programs: Towards improved targeting and evaluation of investments. *Land Use Policy*, 26(2), 471–478. <https://doi.org/10.1016/j.landusepol.2008.06.004>
- Hamilton, C. (2015). The Theodicy of the “Good Anthropocene.” *Environmental Humanities*, 7(1), 233–238. <https://doi.org/10.1215/22011919-3616434>
- Hamilton, C. (2016). The Anthropocene as rupture. *Anthropocene Review*, 3(2), 93–106. <https://doi.org/10.1177/2053019616634741>
- Hannam, I. (2001). Ecologically sustainable soil: The role of environmental policy and legislation. In D. E. Stott, R. H. Mohtar, & G. C. Stanhardt (Eds.), *Sustaining the Global Farm. Selected papers from the 10th International Soil Conservation Organization held May 24-29, 1999, at Purdue University and the USDA-ARS National Erosion Research Laboratory* (pp. 95–100). <https://www.tucson.ars.ag.gov/isco/isco10/sustainingtheglobalfarm/po10-hannam.pdf>
- Hannam, I. (2020). Soil legislation in Australia. In H. Yahyah, H. Ginzky, E. Kasimbazi, R. Kibugi, & O. C. Ruppel (Eds.), *Legal Instruments for Sustainable Soil Management in Africa* (pp. 181–212). Springer. <https://doi.org/10.1007/978-3-030-36004-7>
- Hansjürgens, B., Lienkamp, A., & Möckel, S. (2018). Justifying soil protection and sustainable soil management: Creation-ethical, legal and economic considerations. *Sustainability (Switzerland)*, 10(10), 3807. <https://doi.org/10.3390/su10103807>
- Haraway, D. (2008). *When species meet*. University of Minnesota Press.
- Haraway, D. (2015). Anthropocene, Capitalocene, Plantationocene, Chthulucene: Making kin. *Environmental Humanities*, 6(1), 159–165. <https://doi.org/10.1215/22011919-3615934>
- Haraway, D. (2016). *Staying with the trouble: Making kin in the Chthulucene*. Duke University Press. <https://doi.org/10.1215/9780822373780>
- Hartemink, A., & McBratney, A. (2008). A soil science renaissance. *Geoderma*, 148(2), 123–129. <https://doi.org/10.1016/j.geoderma.2008.10.006>
- Harvey, D. (2007). *A brief history of neoliberalism*. Oxford University Press.
- Haugaard, M. (2009). Power and Hegemony. In S. R. Clegg & M. Haugaard (Eds.), *The Sage Handbook of Power* (pp. 239–255). SAGE.
- Haugaard, M. (2012). Rethinking the four dimensions of power: Domination and empowerment. *Journal of Political Power*, 5(1), 33–54. <https://doi.org/10.1080/2158379X.2012.660810>
- Havelock, R. G. (1979). *Planning for innovation through dissemination and utilization of knowledge*. Centre for Research on Utilization of Scientific Knowledge, Institute for Social Research, University of Michigan.
- Hay, C. (2002). *Political analysis. A critical introduction*. Palgrave.

- Hay, C. (2007). *Why we hate politics*. Polity.
- Hay, C. (2013). From politics to politicisation: defending the indefensible? *Politics, Groups and Identities*, 1(1), 109–112.
<https://doi.org/10.1080/21565503.2012.760315>
- Hay, C. (2014). Depoliticisation as process, governance as practice: What did the ‘first wave’ get wrong and do we need a ‘second wave’ to put it right? *Policy and Politics*, 42(2), 293–311.
<https://doi.org/10.1332/030557314X13959960668217>
- Head, B. (2008). Wicked problems in public policy. *Public Policy*, 3(2), 101–118.
- Head, B. (2019). Forty years of wicked problems literature: forging closer links to policy studies. *Policy & Society*, 38(2), 180–197.
<https://doi.org/10.1080/14494035.2018.1488797>
- Head, B., & Alford, J. (2015). Wicked problems. *Administration & Society*, 47(6), 711–739. <https://doi.org/10.1177/0095399713481601>
- Helming, K., Daedlow, K., Hansjürgens, B., & Koellner, T. (2018). Assessment and governance of sustainable soil management. In *Sustainability (Switzerland)*, 10(12), 4432–. <https://doi.org/10.3390/su10124432>
- Henning, C. (2007). Ideology. In G. Ritzer (Ed.), *The Blackwell Encyclopedia of Sociology* (pp. 2230–2232). Blackwell Publishing.
- Heuser, I. (2019). Development of soil awareness in Europe and other regions: Historical and ethical reflections about European (and international) soil protection law. In H. Ginzky, E. Dooley, I. L. Heuser, E. Kasimbizi, T. Markus, & T. Qin (Eds.), *International Yearbook of Soil and Law Policy 2018* (pp. 451–474). Springer. <https://doi.org/10.1007/978-3-030-00758-4>
- Hill, M., & Clérico, C. (2013). *Avances en políticas de manejo y conservación de suelos en Uruguay*. *IAH*, 12, 2–6. [http://www.ipni.net/publication/ia-lacs.nsf/o/B387A9BDC39CF5C985257C39005C4C6B/\\$FILE/2.pdf](http://www.ipni.net/publication/ia-lacs.nsf/o/B387A9BDC39CF5C985257C39005C4C6B/$FILE/2.pdf)
- Hill, M. R., Pert, P. L., Davies, J., Robinson, C. J., Walsh, F., & Falco-Mammone, F. (2013). *Indigenous land management in Australia. A summary of the extent, barriers and success factors*. CSIRO Publishing.
<https://www.agriculture.gov.au/sites/default/files/sitecollectiondocuments/natural-resources/landcare/submissions/ilm-report.pdf>
- Hill, R. (2017). The place of soil in international government policy. In D. J. Field, C. L. Morgan, & A. B. McBratney (Eds.), *Global Soil Security* (pp. 443–449). Springer. <https://doi.org/10.1007/978-3-319-43394-3>
- Hiller, A. (2017). Consequentialism in environmental ethics. In S. Gardiner & A. Thompson (Eds.), *The Oxford Handbook of Environmental Ethics* (pp. 211–222). Oxford University Press.
<https://doi.org/10.1093/oxfordhb/9780199941339.001.0001>

- Himes, A., & Muraca, B. (2018). Relational values: The key to pluralistic valuation of ecosystem services. *Current Opinion in Environmental Sustainability*, 35, 1–7. <https://doi.org/10.1016/j.cosust.2018.09.005>
- Hisschemöller, M., & Hoppe, R. (1996). Coping with interactable controversies: The case for problem structuring in policy design and analysis. *Knowledge and Policy: The International Journal of Knowledge Transfer and Utilization*, 8(4), 40–60.
- Hogwood, B. W., & Gunn, L. A. (1984). *Policy analysis for the real world*. Oxford University Press.
- Holt-Gimenez, E. (2008, January 10). *The world food crisis: What's behind it and what we can do about it*. Food First. <https://archive.foodfirst.org/publication/the-world-food-crisis-whats-behind-it-and-what-we-can-do-about-it/>
- Holt-Giménez, E., & Altieri, M. A. (2016, October 18). *Agroecology “Lite:” Co-optation and Resistance in the Global North*. Food First. <https://archive.foodfirst.org/agroecology-lite-cooptation-and-resistance-in-the-global-north/>
- Hoornbeek, J., & Peters, G. (2017). Understanding policy problems: A refinement of past work. *Policy and Society*, 36(3), 365–384. <https://doi.org/10.1080/14494035.2017.1361631>
- Hoppe, R. (2002). Cultures of public policy problems. *Journal of Comparative Policy Analysis: Research and Practice*, 4(3), 305–326. <https://doi.org/10.1080/13876980208412685>
- Hoppe, R. (2010). *The governance of problems. Puzzling, powering, participation*. Policy Press.
- Hoppe, R. (2018). Rules-of-thumb for problem-structuring policy design. *Policy Design and Practice*, 1(1), 12–29. <https://doi.org/10.1080/25741292.2018.1427419>
- Hornborg, A. (2015). The political ecology of the Technocene: Uncovering ecologically unequal exchange in the world-system. In C. Hamilton, C. Bonneuil, & F. Gemenne (Eds.), *The Anthropocene and the global environmental crisis rethinking modernity in a new epoch* (pp. 177–183). Routledge.
- Horton, D. (2000). *The pure state of nature: sacred cows, destructive myths and the environment*. Allen & Unwin.
- Hou, D. (2020). Knowledge sharing and adoption behaviour: An imperative to promote sustainable soil use and management. *Soil Use and Management*, 36(4), 557–560. <https://doi.org/10.1111/sum.12648>
- Howard, T., & Lawson, A. (2015). Soil governance: Accessing cross-disciplinary perspectives. *International Journal of Rural Law and Policy*, 1, 98–105.

- Howlett, M., & Cashore, B. (2014a). Conceptualizing public policy. In I. Engeli & C. R. Allison (Eds.), *Comparative policy studies: Conceptual and methodological challenges* (pp. 185–204).
- Huberman, M. (1994). Research utilization: The state of the art. *Knowledge, Technology & Policy*, 7, 13–33.
- Hunt, W., Birch, C., Coutts, J., & Vanclay, F. (2012). The many turnings of agricultural extension in Australia. *Journal of Agricultural Education and Extension*, 18(1), 9–26. <https://doi.org/10.1080/1389224X.2012.638780>
- Hunter, M. C., Smith, R. G., Schipanski, M. E., Atwood, L. W., & Mortensen, D. A. (2017). Agriculture in 2050: Recalibrating targets for sustainable intensification. *BioScience*, 67(4), 386–391. <https://doi.org/10.1093/biosci/bix010>
- Iles, A. (2021). Can Australia transition to an agroecological future? *Agroecology and Sustainable Food Systems*, 45(1), 3–41. <https://doi.org/10.1080/21683565.2020.1780537>
- Imhof, M., Kidd, D., Jenkins, B., Stewart, J., & Overheu, T. (2018). Mapping strategic agricultural land. *Soil Science Policy Journal*, 1.
- Ingram, J., & Morris, C. (2007). The knowledge challenge within the transition towards sustainable soil management: An analysis of agricultural advisors in England. *Land Use Policy*, 24(1), 100–117. <https://doi.org/10.1016/j.landusepol.2005.07.002>
- Intergovernmental Panel on Climate Change. (2019). *Summary for policymakers. Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems*. In press. https://www.ipcc.ch/site/assets/uploads/sites/4/2020/02/SPM_Updated-Jan20.pdf
- Intergovernmental Panel on Climate Change. (2021). *Summary for policymakers. Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. https://unfccc.int/sites/default/files/resource/slides_SBSTA_MASTER.pdf
- International Union for Conservation of Nature. (2021). *Why is natural resource governance important?* IUCN CEESP Natural Resource Governance Framework Working Group. <https://www.iucn.org/our-union/commissions/group/iucn-ceesp-natural-resource-governance-framework-working-group>
- Jacobs, S., Dendoncker, N., Martín-López, B., Barton, D., Gomez-Baggethun, E., Boeraeve, F., McGrath, F., Vierikko, K., Geneletti, D., Sevecke, K., Pipart, N., Primmer, E., Mederly, P., Schmidt, S., Aragão, A., Baral, H., Bark, R., Briceno, T., Brogna, D., ... Washbourn, C. (2016). A new valuation school: Integrating

- diverse values of nature in resource and land use decisions. *Ecosystem Services*, 22(November), 213–220. <https://doi.org/10.1016/j.ecoser.2016.11.007>
- Janghorban, R., Roudsari, R. L., & Taghipour, A. (2014). Skype interviewing: The new generation of online synchronous interview in qualitative research. *International Journal of Qualitative Studies on Health and Well-Being*, 9(1), 24152–. <https://doi.org/10.3402/qhw.v9.24152>
- Janzen, H. H., Janzen, D. W., & Gregorich, E. G. (2021). The ‘soil health’ metaphor: Illuminating or illusory? *Soil Biology and Biochemistry*, 159, 108167–. <https://doi.org/10.1016/j.soilbio.2021.108167>
- Jeffery, M. (2017). *Restore the Soil: Prosper the Nation*. National Advocate for Soil Health: Report to the Prime Minister. Australian Government. <https://www.agriculture.gov.au/sites/default/files/sitecollectiondocuments/ag-food/publications/restore-soil-prosper.pdf>
- Jenkins, L. (2011). The difference genealogy makes: Strategies for politicisation or how to extend capacities for autonomy. *Political Studies*, 59(1), 156–174. <https://doi.org/10.1111/j.1467-9248.2010.00844.x>
- Jenkins, W. (1978). *Policy analysis: A political and organizational perspective*. Martin Robertson.
- Jessop, B. (2014). Repoliticising depoliticisation: Theoretical preliminaries on some responses to the American fiscal and Eurozone debt crises. *Politics & Policy*, 42(2), 207–223. <https://doi.org/10.1332/030557312X655864>
- John, P. (2013). *Analyzing public policy*. Routledge. <https://doi.org/10.4324/9780203136218>
- Jones, B. D., & Baumgartner, F. R. (2005). *The politics of attention: How government prioritizes problems*. University of Chicago Press. <https://doi.org/10.1057/ap.2008.26>
- Jones, C., Hesterly, W. S., & Borgatti, S. P. (1997). A general theory of network governance: Exchange conditions and social mechanisms. *Academy of Management Review*, 22(4), 911–945. <https://doi.org/10.5465/AMR.1997.9711022109>
- Jones, J. S. (2018). Emergence of the soil conservation act 1938 (NSW): The origins of a co-operative and voluntary regulatory approach to Landcare on private land 1884–1938. *Environmental and Planning Law Journal*, 35(1), 5–25.
- Jónsson, J. Ö. G., & Davídsdóttir, B. (2016). Classification and valuation of soil ecosystem services. *Agricultural Systems*, 145, 24–38. <https://doi.org/10.1016/j.agsy.2016.02.010>
- Jorge-Smeding, E. (2019, August 6). *Las desigualdades ambientales y el paradigma de la intensificación sostenible: coordinadas para una crítica necesaria*. La Diaria. <https://ladiaria.com.uy/articulo/2019/8/las-desigualdades-ambientales-y-el-paradigma-de-la-intensificacion-sostenible-coordenadas-para-una-critica-necesaria/>

- Jotzo, F. (2021, November 1). *Scott Morrison attends pivotal global climate talks today, bringing a weak plan that leaves Australia exposed*. The Conversation. <https://theconversation.com/scott-morrison-attends-pivotal-global-climate-talks-today-bringing-a-weak-plan-that-leaves-australia-exposed-170842>
- Juerges, N., & Hansjürgens, B. (2018). Soil governance in the transition towards a sustainable bioeconomy – A review. *Journal of Cleaner Production*, 170, 1628–1639. <https://doi.org/10.1016/j.jclepro.2016.10.143>
- Justus, J., Colyvan, M., Regan, H., & Maguire, L. (2009). Buying into conservation: Intrinsic versus instrumental value. *Trends in Ecology and Evolution*, 24(4), 187–191. <https://doi.org/10.1016/j.tree.2008.11.011>
- Kadykalo, A. N., López-Rodríguez, M. D., Ainscough, J., Droste, N., Ryu, H., Ávila-Flores, G., Le Clec'h, S., Muñoz, M. C., Nilsson, L., Rana, S., Sarkar, P., Sevecke, K. J., & Harmáčková, Z. V. (2019). Disentangling 'ecosystem services' and 'nature's contributions to people.' *Ecosystems and People*, 15(1), 269–287. <https://doi.org/10.1080/26395916.2019.1669713>
- Kangas, O. E., Niemelä, M., & Varjonen, S. (2014). When and why do ideas matter? The influence of framing on opinion formation and policy change. *European Political Science Review*, 6(1), 73–92. <https://doi.org/10.1017/S1755773912000306>
- Kanowski, P., & McKenzie, N. (2011). *Land: Australia State of the Environment 2011*, Australian Government. <https://wedocs.unep.org/handle/20.500.11822/8835>
- Karlberg, M. (2005). The power of discourse and the discourse of power: Pursuing peace through discourse intervention. *International Journal of Peace Studies*, 10(1), 1–25.
- Kauffman, C. M., & Martin, P. L. (2018). Constructing rights of nature norms in the US, Ecuador, and New Zealand. *Global Environmental Politics*, 18(43), 43–62. https://doi.org/10.1162/glep_a_00481
- Kearnes, M., & Rickards, L. (2015). Growing the social life of soil. *Australian Policy Online*. <https://doi.org/10.4225/50/5668B815A9E22>
- Keesstra, S., Bouma, J., Wallinga, J., Tiftonell, P., Smith, P., Cerdà, A., Montanarella, L., Quinton, J., Pachepsky, Y., Van der Putten, W., Bardgett, R., Moolenaar, S., Mol, G., Jansen, B., & Fresco, L. (2016). The significance of soils and soil science towards realization of the United Nations Sustainable Development Goals. *Soil*, 2(2), 111–128. <https://doi.org/10.5194/soil-2-111-2016>
- Kemp, D. R., & Dowling, P. M. (2000). Towards sustainable temperate perennial pastures. *Australian Journal of Experimental Agriculture*, 40(2), 125–132.
- Kenis, A. (2019). Post-politics contested: Why multiple voices on climate change do not equal politicisation. *Environment and Planning C: Politics and Space*, 37(5), 831–848. <https://doi.org/10.1177/0263774X18807209>

- Kenis, A., & Lievens, M. (2014). Searching for “the political” in environmental politics. *Environmental Politics*, 23(4), 531–548.
<https://doi.org/10.1080/09644016.2013.870067>
- Kibblewhite, M., & Gregor, M. (2021). *Towards a holistic soil protection in Luxembourg*. Administration de L’Environnement of the Grand Duchy of Luxembourg.
<https://environnement.public.lu/content/dam/environnement/documents/natur/sol/rapports/202111-SoilProtection-Report-EN.pdf>
- Kibblewhite, M., Miko, L., & Montanarella, L. (2012). Legal frameworks for soil protection: Current development and technical information requirements. *Current Opinion in Environmental Sustainability*, 4(5), 573–577.
<https://doi.org/10.1016/j.cosust.2012.08.001>
- Kingdon, J. (1984). *Agendas, alternatives, and public policies*. Little, Brown.
- Kivimaa, P., & Mickwitz, P. (2011). Public policy as a part of transforming energy systems: Framing bioenergy in Finnish energy policy. *Journal of Cleaner Production*, 19(16), 1812–1821. <https://doi.org/10.1016/j.jclepro.2011.02.004>
- Klain, S., Olmsted, P., Chan, K. M. A., & Satterfield, T. (2017). Relational values resonate broadly and differently than intrinsic or instrumental values, or the new ecological paradigm. *PLoS ONE*, 12(8), 1–21.
<https://doi.org/10.1371/journal.pone.0183962>
- Klein Goldewijk, K., Beusen, A., Van Drecht, G., & De Vos, M. (2011). The HYDE 3.1 spatially explicit database of human-induced global land-use change over the past 12,000 years. *Global Ecology and Biogeography*, 20(1), 73–86.
<https://doi.org/10.1111/j.1466-8238.2010.00587.x>
- Klijn, E. H., & Koppenjan, J. (2016). *Governance networks in the public sector*. Routledge. <https://doi.org/10.4324/9781315887098>
- Knoepfel, P., Larrue, C., Varone, F., & Hill, M. (2011). *Public policy analysis*. Bristol University Press.
- Koch, A. (2017). Soil security for agricultural productivity: The policy disconnect and a promising future. In D. J. Field, C. L. Morgan, & A. B. McBratney (Eds.), *Global Soil Security* (pp. 425–435). Springer.
<https://doi.org/10.1007/978-3-319-43394-3>
- Koch, A., Chappell, A., Eyres, M., & Scott, E. (2015). Monitor soil degradation or triage for soil security? An Australian challenge. *Sustainability (Switzerland)*, 7(5), 4870–4892. <https://doi.org/10.3390/su7054870>
- Koch, A., McBratney, A., Barbier, E., Binkley, D., Parton, W., Wall, D., Bird, M., Bouma, J., Chenu, C., Flora, C., Goulding, K., Grunwald, S., Hempel, J., Jastrow, J., Lehmann, J., Lorenz, K., Morgan, C. L., Rice, Ch., Whitehead, D., ... Zimmermann, M. (2013). Soil security: solving the global soil crisis. *Global Policy*, 4(4), 434–441. <https://doi.org/10.1111/1758-5899.12096>

- Koch, A., McBratney, A., & Lal, R. (2012). Global soils week: Put soil security on the global agenda. *Nature (London)*, 492(7428), 186–186.
<https://doi.org/10.1038/492186d>
- Kooiman, J. (1993). *Modern governance. New government–society interactions*. SAGE.
- Kooiman, J. (2003). *Governing as governance*. SAGE.
- Kopittke, P. M., Menzies, N. W., Dalal, R. C., McKenna, B. A., Husted, S., Wang, P., & Lombi, E. (2021). The role of soil in defining planetary boundaries and the safe operating space for humanity. *Environment International*, 146, 106245–. <https://doi.org/10.1016/j.envint.2020.106245>
- Kopnina, H. (2016). Nobody likes dichotomies (but sometimes you need them). *Anthropological Forum*, 26(4), 415–429.
<https://doi.org/10.1080/00664677.2016.1243515>
- Kopnina, H., & Washington, H. (2020). Conservation and justice in the Anthropocene: Definition and debates. In H. Kopnina & H. Washington (Eds.), *Conservation: Integrating Social and Ecological Justice*. Springer.
<https://doi.org/10.1007/978-3-030-13905-6>
- Kortetmäki, T. (2017). *Justice in and to nature. An application of the broad framework of environmental and ecological justice* [Doctoral dissertation, University of Jyväskylä]. University Library of Jyväskylä.
https://jyx.jyu.fi/bitstream/handle/123456789/54950/978-951-39-7127-4_vaitos09082017.pdf?sequence=1
- Kosoy, N., & Corbera, E. (2010). Payments for ecosystem services as commodity fetishism. *Ecological Economics*, 69(6), 1228–1236.
<https://doi.org/10.1016/j.ecolecon.2009.11.002>
- Kraamwinkel, C. T., Beaulieu, A., Dias, T., & Howison, R. A. (2021). Planetary limits to soil degradation. *Communications Earth & Environment*, 2(1), 1–4.
<https://doi.org/10.1038/s43247-021-00323-3>
- Krzywoszynska, A. (2019). Caring for soil life in the Anthropocene: The role of attentiveness in more-than-human ethics. *Transactions of the Institute of British Geographers*, 44(4), 661–675. <https://doi.org/10.1111/tran.12293>
- Krzywoszynska, A. (2020). Nonhuman Labor and the Making of Resources. *Environmental Humanities*, 12(1), 227–249. <https://doi.org/10.1215/22011919-8142319>
- Krzywoszynska, A. (2021). *Soil care: understanding soil needs, responsibilities, and attentiveness through the concept of care*. International Union of Soil Sciences. <https://doi.org/10.13140/RG.2.2.13789.74728>
- Krzywoszynska, A., & Marchesi, G. (2020). Toward a Relational Materiality of Soils: Introduction. *Environmental Humanities*, 12(1), 190–204.
<https://doi.org/10.1215/22011919-8142297>

- Kusmanoff, A. M. (2017). *Framing the conservation conversation: An investigation into framing techniques for communicating biodiversity conservation* [Doctoral dissertation, RMIT University]. RMIT University Research Repository.
https://researchrepository.rmit.edu.au/esploro/outputs/doctoral/Framing-the-conservation-conversation-an-investigation/9921863894901341?institution=61RMIT_INST
- Kusmanoff, A. M., Fidler, F., Gordon, A., & Bekessy, S. A. (2017). Decline of 'biodiversity' in conservation policy discourse in Australia. *Environmental Science and Policy*, 77, 160–165. <https://doi.org/10.1016/j.envsci.2017.08.016>
- Laban, P., Metternicht, G., & Davies, J. (2018). *Soil biodiversity and soil organic carbon: Keeping drylands alive*. International Union for Conservation of Nature. <https://doi.org/10.2305/iucn.ch.2018.03.en>
- Lacey, N. (1992). Theories of Justice and the Welfare State. *Social & Legal Studies*, 1(3), 323–344. <https://doi.org/10.1177/096466399200100301>
- Laeni, N., van den Brink, M. A., Trelle, E. M., & Arts, E. J. M. M. (2020). Going Dutch in the Mekong Delta: A framing perspective on water policy translation. *Journal of Environmental Policy and Planning*, 23(1), 16–33. <https://doi.org/10.1080/1523908X.2020.1792858>
- Lake, A. (2012, October 14–18). *Australia's declining crop yield trends I: Donald revisited* [Paper presentation]. 16th Australian Agronomy Conference, Armidale, Australia. Retrieved 2 March, 2020, from https://www.agronomyaustraliaproceedings.org/images/sampled/2012/8163_6_lake.pdf
- Lakoff, G. (2008). *Framing: the role of the brain in politics*. University of California Digital Library. Retrieved 10 November, 2018, from <https://escholarship.org/content/qt07r5v60p/qt07r5v60p.pdf>
- Lakoff, G. (2010). Why it matters how we frame the environment. *Environmental Communication*, 4(1), 70–81. <https://doi.org/10.1080/17524030903529749>
- Lal, R. (2019). Rights-of-soil. *Journal of Soil and Water Conservation*, 74(4), 81A–86A. <https://doi.org/10.2489/jswc.74.4.81A>
- Lal, R., Safriel, U., & Boer, B. (2012). *Zero Net Land Degradation: A New Sustainable Development Goal for Rio+20*. United Nations Convention to Combat Desertification. https://catalogue.unccd.int/991_Zero_Net_Land_Degradation_Report_UNC_CD_May_2012.pdf
- Lanzilotta, B. (2015). *Impuestos verdes: viabilidad y posibles impactos en Uruguay*. CEPAL. <http://hdl.handle.net/11362/38655>
- Lasswell, H. (1971). *A pre-view of policy sciences*. American Elsevier Publishing.
- Latour, B. (2004). *Politics of nature: How to bring the sciences into democracy*. Harvard University Press.

- Latour, B. (2005). *Reassembling the Social: An introduction to actor-network theory*. Oxford University Press.
- Latour, B. (2016). The immense cry channeled by Pope Francis. *Environmental Humanities*, 8(2), 251–255. <https://doi.org/10.1215/22011919-3664360>
- Law, J. (2004). *After method: Mess in social science research*. Routledge. <https://doi.org/10.4324/9780203481141>
- Law, J., & Lien, M. (2018). Denaturalizing nature. In M. de la Cadena & M. Blaser (Eds.), *A World of Many Worlds* (pp. 131–171). Duke University Press. <https://doi.org/10.1215/9781478004318>
- LeCain, T. J. (2015). Against the Anthropocene. *International Journal for History, Culture and Modernity*, 3(1), 1–28. <https://doi.org/10.18352/22130624-00301001>
- Lehmann, J., Bossio, D. A., Kögel-Knabner, I., & Rillig, M. C. (2020). The concept and future prospects of soil health. *Nature Reviews Earth and Environment*, 1(10), pp. 544–553. <https://doi.org/10.1038/s43017-020-0080-8>
- Leinfelder, R. (2020). *The Anthropocene - The Earth in Our Hands*. Refubium Freie Universität Berlin. <https://doi.org/10.17169/refubium-26459>
- Leith, P., O’Toole, K., Haward, M., & Coffey, B. (2017). *Enhancing science impact: Bridging research, policy and practice for sustainability*. CSIRO Publishing.
- Lejano, R. (2015). Narrative disenchantment. *Critical Policy Studies*, 9(3), 368–371. <https://doi.org/10.1080/19460171.2015.1075736>
- Lele, S., Brondizio, E. S., Byrne, J., Mace, G. M., & Martinez-Alier, J. (2018). Framing the environment. In S. Lele, E. S. Brondizio, J. Byrne, G. M. Mace, & J. Martinez-Alier (Eds.), *Rethinking Environmentalism: Linking Justice, Sustainability, and Diversity* (pp. 1–19). MIT Press. <https://doi.org/10.7551/mitpress/11961.001.0001>
- Leopold, A. (1949). *A Sand County Almanac and Sketches Here and There*. Oxford University Press.
- Levi, W. (1970). Ideology, Interests, and Foreign Policy. *International Studies Quarterly*, 14(1), 1–31.
- Levin, K., Cashore, B., Bernstein, S., & Auld, G. (2009). Playing it forward: Path dependency, progressive incrementalism, and the “super wicked” problem of global climate change. *IOP Conference Series: Earth and Environmental Science*, 6(50), 502002. <https://doi.org/10.1088/1755-1307/6/50/502002>
- Levin, K., Cashore, B., Bernstein, S., & Auld, G. (2012). Overcoming the tragedy of super wicked problems: Constraining our future selves to ameliorate global climate change. *Policy Sciences*, 45(2), 123–152. <https://doi.org/10.1007/s11077-012-9151-0>
- Leys, J. F., Heidenreich, S. K., Strong, C. L., McTainsh, G. H., & Quigley, S. (2011). PM10 concentrations and mass transport during “Red Dawn” - Sydney 23

- September 2009. *Aeolian Research*, 3(3), 327–342.
<https://doi.org/10.1016/j.aeolia.2011.06.003>
- Li, L., & Messner, D. (2021). Advancing soil governance for sustainable development. *Soil Security*, 5, 100021.
<https://doi.org/10.1016/j.soisec.2021.100021>
- Li, X., Ge, L., Dong, Y., & Hsing-Chung, Ch. (2010). Estimating the greatest dust storm in eastern Australia with MODIS satellite images. *2010 IEEE International Geoscience and Remote Sensing Symposium*, 1039–1042.
<https://doi.org/10.1109/IGARSS.2010.5649212>
- Lidskog, R. (2014). Representing and regulating nature: Boundary organisations, portable representations, and the science-policy interface. *Environmental Politics*, 23(4), 670–687. <https://doi.org/10.1080/09644016.2013.898820>
- Lincoln, Y. S., & Guba, E. G. (1986). But is it rigorous? Trustworthiness and authenticity in naturalistic evaluation. *New Directions for Program Evaluation*, 30, 73–84. <https://doi.org/10.1002/ev.1427>
- Lindblom, C. E. (1959). The science of “muddling through”. *Public Administration Review*, 19(2), 79–88.
- Lis, A., & Stankiewicz, P. (2017). Framing shale gas for policymaking in Poland. *Journal of Environmental Policy and Planning*, 19(1), 53–71.
<https://doi.org/10.1080/1523908X.2016.1143355>
- Lockie, S. (2013). Market instruments, ecosystem services, and property rights: Assumptions and conditions for sustained social and ecological benefits. *Land Use Policy*, 31, 90–98. <https://doi.org/10.1016/j.landusepol.2011.08.010>
- Lockie, S., & Higgins, V. (2007). Roll-out neoliberalism and hybrid practices of regulation in Australian agri-environmental governance. *Journal of Rural Studies*, 23(1), 1–11.
- Lockie, S., Lawrence, G., & Cheshire, L. (2006). Reconfiguring rural resource governance: the legacy of neoliberalism in Australia. In P. Cloke, T. Marsden, & P. Mooney (Eds.), *Handbook of Rural Studies* (pp. 29–43). SAGE.
- Loman, O. (2020). A problem for environmental pragmatism: Value pluralism and the sustainability principle. *Contemporary Pragmatism*, 17(4), 286–310.
<https://doi.org/10.1163/18758185-17040003>
- Looney, J. W. (1991). Land degradation in Australia: The search for a legal remedy. *Journal of Soil and Water Conservation*, 46(4), 256–259.
- Lövbrand, E., Beck, S., Chilvers, J., Forsyth, T., Hedrén, J., Hulme, M., Lidskog, R., & Vasileiadou, E. (2015). Who speaks for the future of Earth? How critical social science can extend the conversation on the Anthropocene. *Global Environmental Change*, 32, 211–218.
<https://doi.org/10.1016/j.gloenvcha.2015.03.012>

- Low, N., & Gleeson, B. (1998). *Justice, society and nature: An exploration of political ecology*. Routledge.
- Lukes, S. (2005). *Power: A Radical View* (2nd ed.). Palgrave Macmillan.
- Lynas, M. (2011). *The God species: Saving the planet in the age of humans*. National Geographic Books.
- Lyons, K. M. (2020). *Vital decomposition: Soil practitioners and life politics*. Duke University Press.
- MacIntyre, A. (1988). *Whose justice? Which rationality?* University of Notre Dame Press.
- Majone, G. (1989). *Evidence, argument, and persuasion in the policy process*. Yale University Press.
- Majone, G. (2006). Agenda Setting. In M. Moran, M. Rein, & R. E. Goodin (Eds.), *The Oxford Handbook of Public Policy* (pp. 228–250). Oxford University Press.
- Malm, A. (2015). *The Anthropocene myth*. Jacobin.
<https://jacobin.com/2015/03/anthropocene-capitalism-climate-change/>
- Malm, A., & Hornborg, A. (2014). The geology of mankind? A critique of the Anthropocene narrative. *Anthropocene Review*, 1(1), 62–69.
<https://doi.org/10.1177/2053019613516291>
- Marchart, O. (2007). *Post-foundational political thought: Political difference in Nancy, Lefort, Badiou and Laclau*. Edinburgh University Press.
- Marchart, O. (2017). What's going on with being? Ontology as critique. *Contemporary Political Theory*, 16(4), 508–513. <https://doi.org/10.1057/s41296-017-0140-0>
- Marchart, O. (2018). *Thinking antagonism: Political ontology after Laclau*. Edinburgh University Press.
- Marsh, D., & Hall, M. (2016). The British political tradition and the material-ideational debate. *British Journal of Politics and International Relations*, 18(1), 125–142. <https://doi.org/10.1111/1467-856X.12077>
- Martin, P. (2017). Soils Governance, an Australian Perspective. In H. Ginzky, I. Heuser, O. Ruppel, & E. Dooley (Eds.), *International Yearbook of Soil and Law Policy 2016* (pp. 31–36). Springer. <https://doi.org/10.1007/978-3-319-42508-5>
- Martín-López, B., & Montes, C. (2015). Restoring the human capacity for conserving biodiversity: A social–ecological approach. *Sustainability Science*, 10(4), 699–706. <https://doi.org/10.1007/s11625-014-0283-3>
- Marttila, T. (2015). *Post-Foundational Discourse Analysis. From Political Difference to Empirical Research*. Palgrave Macmillan UK.
<https://doi.org/10.17169/fqs-16.3.2282>

- Mason, R. O., & Mitroff, I. I. (1981). *Challenging strategic planning assumptions: Theory, cases, and techniques*. John Wiley & Sons Inc.
- Matson, P. A., Parton, W. J., Power, A. G., & Swift, M. J. (1997). Agricultural intensification and ecosystem properties. *Science*, 277(5325), 504–509. <https://doi.org/10.1126/science.277.5325.504>
- Mattijssen, T. J. M., Ganzevoort, W., Van Den Born, R. J. G., Arts, B. J. M., Breman, B. C., Buijs, A. E., Van Dam, R. I., Elands, B. H. M., De Groot, W. T., & Knippenberg, L. W. J. (2020). Relational values of nature: leverage points for nature policy in Europe. *Ecosystems and People*, 16(1), 402–410. <https://doi.org/10.1080/26395916.2020.1848926>
- Mayer, I. (1997). *Debating technologies: A methodological contribution to the design and evaluation of participatory policy analysis* [Doctoral dissertation, Tilburg University]. Tilburg University Press. <https://research.tilburguniversity.edu/files/218894/74882.pdf>
- McBratney, A., Field, D. J., & Jarrett, L. E. (2017). General concepts of valuing and caring for soil. In D. J. Field, C. L. Morgan, & A. B. McBratney (Eds.), *Global Soil Security* (pp. 101–109). Springer. <https://doi.org/10.1007/978-3-319-43394-3>
- McBratney, A., Field, D. J., Morgan, C. L., & Jarrett, L. E. (2017). Soil security: A rationale. In D. J. Field, C. L. Morgan, & A. B. McBratney (Eds.), *Global Soil Security*. Springer. <https://doi.org/10.1007/978-3-319-43394-3>
- McBratney, A., Morgan, C. L., & Jarrett, L. E. (2017). The value of soil's contributions to ecosystem services. In D. J. Field, C. L. Morgan, & A. B. McBratney (Eds.), *Global Soil Security* (pp. 227–235). Springer. <https://doi.org/10.1007/978-3-319-43394-3>
- McCauley, D. (2006). Selling out on nature. *Nature*, 443(7107), 27–28. <https://doi.org/10.1038/443027a>
- McNay. (2017). Ontology and critique. *Contemporary Political Theory*, 16(4), 524–531. <https://doi.org/10.1057/s41296-017-0140-0>
- McShane, K. (2014). Ecocentrism. In C. Death (Ed.), *Critical environmental politics* (pp. 83–90). Routledge.
- McTainsh, G. H., Leys, J. F., O'Loingsigh, T. O., & Strong, C. L. (2011). *Wind erosion and land management in Australia during 1940-1949 and 2000-2009*. Australian Government.
- Millennium Ecosystem Assessment. (2005). *Ecosystems and Human Well-Being: Synthesis*. Island Press. <https://www.millenniumassessment.org/documents/document.356.aspx.pdf>
- Meadowcroft, J. (2007). Who is in charge here? Governance for sustainable development in a complex world. *Journal of Environmental Policy and Planning*, 9(3–4), 299–314. <https://doi.org/10.1080/15239080701631544>

- Meadowcroft, J. (2019). Epilogue: Continuity and change in the Anthropocene. In F. Biermann & E. Lövbrand (Eds.), *Anthropocene encounters: New directions in green political thinking* (pp. 228–242). Cambridge University Press.
<https://doi.org/10.1017/9781108646673>
- Meadowcroft, J., & Fiorino, D. J. (Eds.) (2017). *Conceptual innovation in environmental policy*. MIT Press.
<https://doi.org/10.7551/mitpress/10246.001.0001>
- Meisch, S. (2019). I want to tell you a story: How narrative water ethics contributes to re-theorizing water politics. *Water*, 11(4), 1–19.
<https://doi.org/10.3390/w11040631>
- Mercer, D., & Marden, P. (2006). Ecologically sustainable development in a ‘quarry’ economy: one step forward, two steps back. *Geographical Research*, 44(2), 183–203. <https://doi.org/10.1111/j.1745-5871.2006.00376.x>
- Metcalfe, D., & Bui, E. (2016). *Australia state of the environment 2016: land*. Australian Government.
- Metze, T. (2018). Framing the future of fracking: Discursive lock-in or energy degrowth in the Netherlands? *Journal of Cleaner Production*, 197, 1737–1745.
<https://doi.org/10.1016/j.jclepro.2017.04.158>
- Meulemans, G., & Granjou, C. (2020). Soils: A new frontier for environmental knowledge and policies. *Revue d'Anthropologie Des Connaissances*, 14, 14–4.
<https://doi.org/10.4000/rac.14082>
- Meyer, J. M. (2020). The politics of the “post-political” contesting the diagnosis. *Democratization*, 27(3), 408–425.
<https://doi.org/10.1080/13510347.2019.1676737>
- Ministry of Livestock, Agriculture and Fisheries of Uruguay. (2019). *Informes anuales sobre Planes de Uso, agricultura de secano y lechería*.
<https://www.gub.uy/ministerio-ganaderia-agricultura-pesca/politicas-y-gestion/informes-anuales-sobre-planes-uso-agricultura-secano-lecheria>
- Micelotta, E., Lounsbury, M., & Greenwood, R. (2017). Pathways of institutional change: An integrative review and research agenda. *Journal of Management*, 43(6), 1885–1910. <https://doi.org/10.1177/0149206317699522>
- Mihai, M., McNay, L., Marchart, O., Norval, A., Paipais, V., Prozorov, S., & Thaler, M. (2017). Democracy, critique and the ontological turn. *Contemporary Political Theory*, 16(4), 501–531. <https://doi.org/10.1057/s41296-017-0140-0>
- Milbrath, L. W. (1960). Lobbying as a Communication Process. *Public Opinion Quarterly*, 24, 32–53.
- Miles, M. B., & Huberman, M. (1994). *Qualitative data analysis: An expanded sourcebook*. SAGE.

- Miller, J. (2005). Biodiversity conservation and the extinction of experience. *Trends in Ecology and Evolution*, 20(8), 430–434. <https://doi.org/10.1016/j.tree.2005.05.013>
- Mills, A., Durepos, G., & Wiebe, E. (2010). *Encyclopedia of Case Study Research*. SAGE.
- Minasny, B., Malone, B. P., McBratney, A., Angers, D. A., Arrouays, D., Chambers, A., Chaplot, V., Chen, Z. S., Cheng, K., Das, B. S., Field, D. J., Gimona, A., Hedley, C. B., Hong, S. Y., Mandal, B., Marchant, B. P., Martin, M., McConkey, B. G., Mulder, V. L., ... Winowiecki, L. (2017). Soil carbon 4 per mille. *Geoderma*, 292, 59–86. <https://doi.org/10.1016/j.geoderma.2017.01.002>
- Ministry of the Environment of Uruguay.(2019). *Plan Nacional Ambiental para el Desarrollo Sostenible*. <https://www.gub.uy/ministerio-ambiente/comunicacion/publicaciones/plan-nacional-ambiental-para-desarrollo-sostenible>
- Ministry of the Environment of Uruguay. (2020). *Informe del Estado del Ambiente 2020 (período 2016-2019)*. <https://www.gub.uy/ministerio-ambiente/politicas-y-gestion/informe-del-estado-del-ambiente-2020>
- Mintrom, M., & Norman, P. (2009). Policy entrepreneurship and policy change. *Policy Studies*, 37(4), 649–667.
- Modernel, P., Rossing, W. A. H., Corbeels, M., Dogliotti, S., Picasso, V., & Tiftonell, P. (2016). Land use change and ecosystem service provision in Pampas and Campos grasslands of southern South America. *Environmental Research Letters*, 11(11). <https://doi.org/10.1088/1748-9326/11/11/113002>
- Mol, A. (1999). Ontological Politics. A word and some questions. *The Sociological Review*, 47(1), 74–89. <https://doi.org/10.1111/j.1467-954x.1999.tb03483.x>
- Mol, A. (2002). *The body multiple: Ontology in medical practice*. Duke University Press.
- Monbiot, G. (2022, May 21). *The secret world beneath our feet is mind-blowing – and the key to our planet’s future*. The Guardian. <https://www.theguardian.com/environment/2022/may/07/secret-world-beneath-our-feet-mind-blowing-key-to-planets-future#comments>
- Montanarella, L. (2015). Govern our soils. *Nature*, 528(7580), 32–33. <https://doi.org/10.1038/528032a>
- Montanarella, L., Pennock, D., McKenzie, N., Badraoui, M., Chude, V., Baptista, I., Mamo, T., Yemefack, M., Singh Aulakh, M., Yagi, K., Young Hong, S., Vijarnsorn, P., Zhang, G., Arrouays, D., Black, H., Krasilnikov, P., Sobocká, J., Alegre, J., Henriquez, C., ... Vargas, R. (2016). World’s soils are under threat. *Soil*, 2(1), 79–82. <https://doi.org/10.5194/soil-2-79-2016>
- Montanarella, L., & Vargas, R. (2012). Global governance of soil resources as a necessary condition for sustainable development. *Current Opinion in*

- Environmental Sustainability*, 4(5), 559–564.
<https://doi.org/10.1016/j.cosust.2012.06.007>
- Mooney, P. H., & Hunt, S. A. (2009). Food security: The elaboration of contested claims to a consensus frame. *Rural sociology*, 74(4), 469–497.
- Moore, J. (Ed.) (2016). *Anthropocene or Capitalocene? Nature, history, and the crisis of capitalism*. PM Press/Kairos.
- Moroni, S. (2018). Property as a human right and property as a special title. Rediscussing private ownership of land. *Land Use Policy*, 70, 273–280.
<https://doi.org/10.1016/j.landusepol.2017.10.037>
- Morton, A., & Hannam, I. (2021, October 30). *Australia's 2050 net zero emissions plan relies on 'gross manipulation' of data, experts say*. The Guardian.
<https://www.theguardian.com/australia-news/2021/oct/30/australias-2050-net-zero-emissions-plan-relies-on-gross-manipulation-of-data-experts-say>
- Moschitz, H. (2018). Where is urban food policy in Switzerland? A frame analysis. *International Planning Studies*, 23(2), 180–194.
<https://doi.org/10.1080/13563475.2017.1389644>
- Mouffe, C. (2005a). *On the Political*. Routledge.
- Mouffe, C. (2005b). *The return of the political*. Verso.
- Müller, W., & Kruse, S. (2021). Modes of drought climatization: A frame analysis of drought problematization in Germany across policy fields. *Environmental Policy and Governance*, 31(5), 546–559. <https://doi.org/10.1002/eet.1954>
- Naess, A. (1973). The shallow and the deep, long-range ecology movement. A summary. *Inquiry*, 16(1–4), 95–100.
- Nederhand, J., Klijn, E. H., Van Der Steen, M., & Van Twist, M. (2019). The governance of self-organization: Which governance strategy do policy officials and citizens prefer? *Policy Sciences*, 52(2), 233–253.
<https://doi.org/10.1007/s11077-018-9342-4>
- New South Wales Department of Primary Industries. (2011a). *Soils Policy Looking Forward Acting Now*. http://www.nswskn.com/wp-content/uploads/2015/02/Draft_-Soil_Policy-December-2011-v2_compressed.pdf
- New South Wales Department of Primary Industries. (2011b). *NSW Soils Policy: Draft Action Plan*. http://www.nswskn.com/wp-content/uploads/2015/02/Draft_Soil-Policy-Action_Plan_v2_17-Oct-2011.pdf
- New South Wales Environment Protection Authority. (2009). *State of the Environment*. <https://www.epa.nsw.gov.au/soe/soe2009/summary.htm>
- New South Wales Environment Protection Authority. (2015). *New South Wales State of the Environment*. <https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/soe2015/20150817soe-2015.pdf>

- New South Wales Environment Protection Authority. (2018). *New South Wales State of the Environment 2018*.
https://www.soe.epa.nsw.gov.au/sites/default/files/2019-05/18p1370-nsw-state-of-the-environment-2018-WEB_9-5-19.pdf
- New South Wales Government. (2009). *Budget Statement 2008-2009*.
https://www.treasury.nsw.gov.au/sites/default/files/pdf/2008-2009_Budget_Papers_BP2_Budget_Statement.pdf
- New South Wales Government. (2013). *Interim protocol for site verification and mapping of biophysical strategic agricultural land*.
<https://www.planning.nsw.gov.au/-/media/Files/DPE/Other/interim-protocol-for-site-verification-and-mapping-of-biophysical-strategic-agricultural-land-2013-04.pdf?la=en>
- New South Wales Office of Environment and Heritage. (2014). *Soil condition and land management in New South Wales: final results from 2008-09 monitoring, evaluation and reporting program*. <https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Land-and-soil/soil-condition-land-management-nsw-140389.pdf>
- New South Wales Office of Environment and Heritage. (2018). *Biodiversity Conservation Investment Strategy 2018: A strategy to guide investment in private land conservation*. <https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Conservation-management-notes/biodiversity-conservation-investment-strategy-2018-180080.pdf>
- Nielsen, U. N., Wall, D. H., & Six, J. (2015). Soil biodiversity and the environment. *Annual Review of Environment and Resources*, 40, 63–90.
<https://doi.org/10.1146/ANNUREV-ENVIRON-102014-021257>
- Nixon, R. (2011). *Slow violence and the environmentalism of the poor*. Harvard University Press. <https://doi.org/10.4159/harvard.9780674061194>
- Norgaard, R. (2013). The Econocene and the California Delta. *San Francisco Estuary and Watershed Science*, 11(3).
- Norton, B. G. (1984). Environmental ethics and weak anthropocentrism. *Environmental Ethics*, 6(2), 131–148.
- Norval, A. (2017). Ontopolitics and the future of democracy. *Contemporary Political Theory*, 16(4). <https://doi.org/10.1057/s41296-017-0140-0>
- Nozick, R. (1974). *Anarchy, state, and utopia*. Basic Books.
- Nussbaum, M. C. (2006). *Frontiers of justice: Disability, nationality, species membership*. Harvard University Press. <https://doi.org/10.2307/j.ctv1c7zftw>
- Nyborg, K., Anderies, J. M., Dannenberg, A., Lindahl, T., Schill, C., Schlüter, M., Adger, W. N., Arrow, K. J., Barrett, S., Carpenter, S. R., Chapin, F. S., Crépin, A. S., Daily, G., Ehrlich, P., Folke, C., Jager, W., Kautsky, N., Levin, S. A.,

- Madsen, O. J., ... De Zeeuw, A. (2016). Social norms as solutions. *Science*, 354(6308), 42–43. <https://doi.org/10.1126/science.aaf8317>
- O'Connor, M. K., & Netting, F. E. (2011). *Analyzing social policy: Multiple perspectives for critically understanding and evaluating policy*. John Wiley & Sons.
- Odum, E. P. (1959). *Fundamentals of ecology*. W. B. Saunders.
- Ojanen, M., Brockhaus, M., Korhonen-Kurki, K., & Petrokofsky, G. (2021). Navigating the science-policy interface: Forest researcher perspectives. *Environmental Science and Policy*, 118, 10–17. <https://doi.org/10.1016/j.envsci.2021.01.002>
- Okereke, C., & Charlesworth, M. (2014). Environmental and ecological justice. In M. Betsill, K. Hochstetler, & D. Stevis (Eds.), *Advances in International Environmental Politics* (pp. 328–355). Palgrave Macmillan.
- Okin, S. (1989). *Justice, Gender, and the Family*. Basic Books.
- Oldeman, L. R. (1992). *The global extent of soil degradation. Bi-Annual Report 1991-1992*. International Soil Reference and Information Centre. <https://edepot.wur.nl/299739>
- Oldeman, L. R., Hakkeling, R. T. A., & Sombroek, W. G. (1990). *World map of the status of human-induced soil degradation. An Explanatory Note* [Working paper]. International Soil Reference and Information Centre (ISRIC). https://www.isric.org/sites/default/files/isric_report_1990_07.pdf
- Otte, P., Maring, L., De Cleen, M., & Boekhold, S. (2012). Transition in soil policy and associated knowledge development. *Current Opinion in Environmental Sustainability*, 4(5), 565–572. <https://doi.org/10.1016/j.cosust.2012.09.006>
- Oyhantçabal, G. (2019). The political economy of progressive Uruguay, 2005–2016. *Latin American Perspectives*, 46(1), 122–136. <https://doi.org/10.1177/0094582X18806587>
- Paavola, J. (2007). Institutions and environmental governance: A reconceptualization. *Ecological Economics*, 63(1), 93–103. <https://doi.org/10.1016/j.ecolecon.2006.09.026>
- Paipais, V. (2017a). *Political ontology and International political thought. Voiding a pluralist world*. Palgrave Macmillan. <https://doi.org/10.1057/978-1-137-57069-7>
- Paipais, V. (2017b). Towards a formal political ontology. *Contemporary Political Theory*, 16(4).
- Pannell, D. J., Ridley, A., Regan, P., & Gale, G. (2004). *Catchment management bodies in four Australian states: structures, legislation, and relationships to Government agencies, CRC for Plant-Based Management of Dryland Salinity*. University of Western Australia.

- Pannell, D. J., & Vanclay, F. (Eds.) (2011). *Changing land management: Adoption of new practices by rural landholders*. CSIRO Publishing.
- Paolino, C. (2013). Uruguay: estrategia de desarrollo agropecuario. In CEPAL (Ed.), *Políticas para la agricultura en América Latina y el Caribe: competitividad, sostenibilidad e inclusión social* (pp. 47–54). https://repositorio.cepal.org/bitstream/handle/11362/7045/LCL3646_es.pdf?sequence=1&isAllowed=y
- Parikka, J. (2014). *The Anthrobscene*. University of Minnesota Press. <https://doi.org/10.5749/9781452958521>
- Parrique, T. (2019). *The political economy of degrowth* [Doctoral dissertation, Université Clermont Auvergne and Stockholm University]. Hal Open Science Archives. <https://tel.archives-ouvertes.fr/tel-02499463/document>
- Partzsch, L. (2017). ‘Power with’ and ‘power to’ in environmental politics and the transition to sustainability. *Environmental Politics*, 26(2), 193–211. <https://doi.org/10.1080/09644016.2016.1256961>
- Partzsch, L., & Fuchs, D. (2012). Philanthropy: Power within international relations. *Journal of Political Power*, 5(3), 359–376. <https://doi.org/10.1080/2158379X.2012.735114>
- Pascoe, B. (2018). *Dark Emu: Aboriginal Australia and the birth of agriculture*. Magabala Books.
- Pascual, U., Termansen, M., Hedlund, K., Brussaard, L., Faber, J. H., Foudi, S., Lemanceau, Ph., & Jørgensen, S. (2015). On the value of soil biodiversity and ecosystem services. *Ecosystem Services*, 15, 11–18. <https://doi.org/10.1016/j.ecoser.2015.06.002>
- Peake, L., & Robb, C. (2022). The global standard bearers of soil governance. *Soil Security*, 6, 100055–. <https://doi.org/10.1016/j.soisec.2022.100055>
- Peake, L., & Robb, C. (2021). Saving the ground beneath our feet: Establishing priorities and criteria for governing soil use and protection. *Royal Society Open Science*, 8(11), 201994–201994. <https://doi.org/10.1098/rsos.201994>
- Pellizzoni, L. (2014). Risk. In C. Death (Ed.), *Critical environmental politics* (pp. 198–207). Routledge. <https://doi.org/10.4324/9781315883076>
- Pellizzoni, L. (2016). *Ontological politics in a disposable world. The new mastery of nature*. Ashgate Publishing Limited. <https://doi.org/10.4324/9781315598925>
- Pellizzoni, L., Leonardi, E., & Asara, V. (2022). Introduction: What is critical environmental politics? In L. Pellizzoni, E. Leonardi, & V. Asara (Eds.), *Handbook of Critical Environmental Politics*. Edward Elgar Publishing.
- Pereira, P., Bogunovic, I., Muñoz-Rojas, M., & Brevik, E. C. (2018). Soil ecosystem services, sustainability, valuation and management. *Current Opinion in*

Environmental Science and Health, 5, 7–13.
<https://doi.org/10.1016/j.coesh.2017.12.003>

- Pérez Bidegain, M., Clérici, C., Terra, J. A., Sawchik, J., & García Préchac, F. (2018). Regulatory utilization of USLE/RUSLE erosion rate estimates in Uruguay: A policy coincident with the UN Sustainable Development Goals. In R. Lal, R. Horn, & T. Kosaki (Eds.), *Soil and Sustainable Development Goals* (pp. 82–91). Catena-Schweizerbart, Stuttgart.
- Pérez Bidegain, M., García Préchac, F., Hill, M., & Clérici, C. (2010). La erosión de suelos en sistemas agrícolas. In F. García Préchac, O. Ernst, P. Arbeletche, M. Pérez Bidegain, C. Prtisch, A. Ferenczi, & M. Rivas (Eds.), *Intensificación agrícola: Oportunidades y amenazas para un país productivo y natural* (pp.67–88). CSIC, Universidad de la República, Uruguay.
- Perez Rocha, J. (2020). *El estado del campo natural en el Uruguay*. Montevideo. FAO, MVOTMA y MGAP.
<https://www.fao.org/documents/card/en/c/cbo989es>
- Pessis, C. (2020). Histoire des «sols vivants». Genèse, projets et oublis d'une catégorie actuelle. *Revue d'Anthropologie Des Connaissances*, 14(4).
<https://doi.org/10.4000/rac.12437>
- Peters, G. (2005). The Problem of Policy Problems. *Journal of Comparative Policy Analysis: Research and Practice*, 7(4), 349–370.
<https://doi.org/10.1080/13876980500319204>
- Peters, G. (2015). *Advanced introduction to public policy*. Edward Elgar Publishing.
- Peters, G. (2016). Institutionalism and Public Policy. In G. Peters & P. Zittoun (Eds.), *Contemporary approaches to public policy: Theories, controversies, and perspectives* (pp. 15–34). Palgrave Macmillan. <https://doi.org/10.1057/978-1-137-50494-4>
- Peters, G., & Pierre, J. (1998). Governance without government? Rethinking public administration. *Journal of Public Administration Research and Theory*, 8(2), 223–243. <https://doi.org/10.1093/oxfordjournals.jpart.a024379>
- Peters, G., & Rava, N. (2017, June 28–30). *Policy design: From technocracy to complexity, and beyond* [Paper presentation]. 3rd International Public Policy Conference, Singapore. Retrieved 6 September, 2018, from <https://www.ippapublicpolicy.org/file/paper/5932fa23369do.pdf>
- Peters, G., & Tarpey, M. (2019). Are wicked problems really so wicked? Perceptions of policy problems. *Policy and Society*, 38(2), 218–236.
<https://doi.org/10.1080/14494035.2019.1626595>
- Peters, G., & Zittoun, P. (2016). Introduction. In G. Peters & P. Zittoun (Eds.), *Contemporary approaches to public policy: Theories, controversies, and perspectives* (pp. 1–14). Palgrave Macmillan. <https://doi.org/10.1057/978-1-137-50494-4>

- Pierre, J., & Peters, G. (2005). *Governing complex societies: Trajectories and scenarios*. Palgrave Macmillan. <https://doi.org/10.1057/9780230512641>
- Pimentel, D. (2006). Soil erosion: A food and environmental threat. *Environment, Development and Sustainability*, 8(1), 119–137. <https://doi.org/10.1007/s10668-005-1262-8>
- Piñeiro, D. (2012). Land grabbing: Concentration and “foreignisation” of land in Uruguay. *Canadian Journal of Development Studies*, 33(4), 471–489. <https://doi.org/10.1080/02255189.2012.746216>
- Piñeiro, D., & Cardeillac, J. (2017). The Frente Amplio and agrarian policy in Uruguay. *Journal of Agrarian Change*, 17(2), 365–380. <https://doi.org/10.1111/joac.12213>
- Pitkin, H. (1972). *Wittgenstein and justice: on the significance of Ludwig Wittgenstein for social and political thought*. University of California Press.
- Plumwood, V. (1999). Ecological ethics from rights to recognition. In N. Low (Ed.), *Global Ethics and Environment* (pp. 188–212). Routledge.
- PNA. (2020). *National Plan for the Promotion of Agroecological-Based Production in Uruguay. Preliminary Document*. Comisión Honoraria del Plan Nacional para el Fomento de la Producción con Bases Agroecológicas. https://www.ceuta.org.uy/data/publicaciones/PNA_DOCUMENTO_final.pdf
- Pohl, L., & Swyngedouw, E. (2021). The World and the Real: Space and the Political after Lacan. In F. Landau, L. Pohl, & N. Roskamm (Eds.), *[Un]Grounding: Post-foundational geographies* (pp. 43–62). Transcript Verlag. <https://doi.org/10.14361/9783839450734-002>
- Polanyi, K. (2001). *The Great Transformation. The political and economic origins of our time* (2nd ed.). Beacon Press.
- Pope, K., Bonatti, M., & Sieber, S. (2021). The what, who and how of socio-ecological justice: Tailoring a new justice model for Earth system law. *Earth System Governance*, 10, 100124–. <https://doi.org/10.1016/j.esg.2021.100124>
- Potiara, C. (2013). Studying linkages between environment issues and poverty: A case from urban Uruguay. *Novos Cadernos NAEA*, 16(2), 27–43. <https://doi.org/10.5801/ncn.v16i2.1399>
- Powelson, D. S., Whitmore, A. P., & Goulding, K. W. T. (2011). Soil carbon sequestration to mitigate climate change: A critical re-examination to identify the true and the false. *European Journal of Soil Science*, 62(1), 42–55. <https://doi.org/10.1111/j.1365-2389.2010.01342.x>
- Prager, K. (2010). Applying the institutions of sustainability framework to the case of agricultural soil conservation. *Environmental Policy and Governance*, 20(4), 223–238. <https://doi.org/10.1002/eet.548>

- Prager, K., & Mckee, A. (2015). Co-production of knowledge in soils governance. *International Journal of Rural Law and Policy*, 1, 1–17.
<https://doi.org/10.5130/ijrlp.i1.2015.4352>
- Prager, K., Schuler, J., Helming, K., Zander, P., Ratering, T., & Hagedorn, K. (2011). Soil degradation, farming practices, institutions and policy responses: An analytical framework. *Land Degradation and Development*, 22(1), 32–46.
<https://doi.org/10.1002/ldr.979>
- Pregernig, M. (2014). Framings of science-policy interactions and their discursive and institutional effects: examples from conservation and environmental policy. *Biodiversity and Conservation*, 23(14), 3615–3639.
<https://doi.org/10.1007/s10531-014-0806-3>
- Prior, L. F. (2007). Document analysis. In G. Ritzer (Ed.), *The Blackwell Encyclopedia of Sociology* (pp. 1213–1216). Blackwell Publishing.
- Puentes, R. (1981). *A framework for the use of the Universal Soil Loss Equation in Uruguay* [Master's Thesis, Texas A&M University]. Texas A&M University Libraries. <http://oaktrust.library.tamu.edu/handle/1969.1/ETD-TAMU-1981-THESIS-P977>
- Puig de la Bellacasa, M. (2014). Encountering bioinfrastructure: Ecological struggles and the sciences of soil. *Social Epistemology*, 28(1), 26–40.
<https://doi.org/10.1080/02691728.2013.862879>
- Puig de la Bellacasa, M. (2015). Making time for soil: Technoscientific futurity and the pace of care. *Social Studies of Science*, 45(5), 691–716.
<https://doi.org/10.1177/0306312715599851>
- Puig de la Bellacasa, M. (2017). *Matters of care: Speculative ethics in more than human worlds*. University of Minnesota Press.
- Puig de la Bellacasa, M. (2019). Re-animating soils: Transforming human–soil affections through science, culture and community. *Sociological Review*, 67(2), 391–407. <https://doi.org/10.1177/0038026119830601>
- Pyle, R. M. (1993). *The thunder tree: lessons from an urban wildland*. Houghton Mifflin.
- Pyle, R. M. (2002). Eden in a vacant lot: special places, species, and kids in the neighbourhood of life. In Kahn, P.H. Jr & S. R. Kellert (Eds.), *Children and nature: Psychological, sociocultural, and evolutionary investigations* (pp. 305–327). MIT Press.
- Ramankutty, N., Lisa, G., Frédéric, A., Diogenes, A., Abha, Ch., DeFries, R., Foley, J. A., Geist, H., Houghton, R., Goldewijk, K. K., Lambin, E., Milington, A., Rasmussen, K., Reid, R., & Turner II, B. L. (2006). Global land-cover change: Recent progress, remaining challenges. In E. F. Lambin & H. Geist (Eds.), *Land-use and land-cover change: Local processes and global impacts* (pp. 9–39). Springer. <https://doi.org/10.1007/3-540-32202-7>

- Ranci re, J. (1999). *Disagreement: Politics and Philosophy*. University of Minnesota Press. <https://doi.org/10.4324/9781315711485>
- Ranci re, J. (2015). *Dissensus: On Politics and Aesthetics*. Bloomsbury Academic. <https://doi.org/10.5040/9781474249966>
- Ranganathan, J., Waite, R., Searchinger, T., & Zions, J. (2020, May 12). *Regenerative agriculture: Good for soil health, but limited potential to mitigate climate change*. World Resources Institute. <https://www.wri.org/blog/2020/05/regenerative-agriculture-climate-change>
- Rawls, J. (1971). *A Theory of Justice* (Revised Edition). Harvard University Press.
- Raworth, K. (2014, October 20). *Must the Anthropocene be a Manthropocene?* The Guardian. <https://www.theguardian.com/commentisfree/2014/oct/20/anthropocene-working-group-science-gender-bias>
- Raymond, C. M., Singh, G. G., Benessaiah, K., Bernhardt, J. R., Levine, J., Nelson, H., Turner, N. J., Norton, B., Tam, J., & Chan, K. M. A. (2013). Ecosystem services and beyond: Using multiple metaphors to understand human-environment relationships. *BioScience*, 63(7), 536–546. <https://doi.org/10.1525/bio.2013.63.7.7>
- Redford, K. H., & Adams, W. M. (2009). Payment for ecosystem services and the challenge of saving nature: Editorial. *Conservation Biology*, 23(4), 785–787. <https://doi.org/10.1111/j.1523-1739.2009.01271.x>
- Redo, D. J., Aide, T. M., Clark, M. L., & Andrade-N nuez, M. J. (2012). Impacts of internal and external policies on land change in Uruguay, 2001-2009. *Environmental Conservation*, 39(2), 122–131. <https://doi.org/10.1017/S0376892911000658>
- Reeve, I. (2001). *Tiptoeing round the slumbering dragon: Property rights and environmental discourse in rural Australia*. Institute for Rural Futures, University of New England.
- Regan, T. (1983). *The case for animal rights*. University of California Press.
- Rein, M. (1976). *Social science and public policy*. Penguin Books.
- Rein, M. (2006). Reframing problematic policies. In M. Moran, M. Rein, & R. E. Goodin (Eds.), *The Oxford Handbook of Public Policy* (pp.389–406). Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780199548453.001.0001>
- Rein, M., & Sch n, D. (1977). Problem setting in policy research. In C. H. Weiss (Ed.), *Using social research in public policy making* (pp. 235–250). Lexington Books.
- Rein, M., & Sch n, D. (1993). Reframing policy discourse. In F. Fischer & J. Forester (Eds.), *The argumentative turn in policy analysis and planning* (pp. 145–166). Duke University Press.

- Rein, M., & Schön, D. (1996). Frame-critical policy analysis and frame-reflective policy practice. *Knowledge and Policy*, 9(1), 85–104. <https://doi.org/10.1007/BF02832235>
- Renard, K., Foster, G., Weesies, G., & Porter, J. (1991). RUSLE: Revised universal soil loss equation. *Journal of Soil and Water Conservation*, 46(1), 30–33.
- Research Data Australia. (n.d.). *Soil Conservation Service. State records authority of New South Wales*. Retrieved 15 March, 2020, from <https://researchdata.edu.au/soil-conservation-service/164995>
- Rhodes, R. A. W. (1996). The new governance: Governing without government. *Political Studies*, 44(4), 652–667. <https://doi.org/10.1111/j.1467-9248.1996.tb01747.x>
- Richter, D. (2007). Humanity's transformation of Earth's soil: Pedology's new frontier. *Soil Science*, 172(12), 957–967. <https://doi.org/10.1097/ss.0b013e3181586bb7>
- Richter, D., Bacon, A., Brecheisen, Z., & Mobley, M. (2015). Soil in the Anthropocene. *IOP Conference Series. Earth and Environmental Science*, 25(1), 12010–12021. <https://doi.org/10.1088/1755-1315/25/1/012010>
- Richter, D., & Tugel, A. J. (2012). Soil change in the Anthropocene: Bridging pedology, land use and soil management. In P. M. Huang, Y. Li, & M. E. Sumner (Eds.), *Handbook of soil sciences properties and processes* (2nd ed.) (pp. 1370–1385). CRC Press. <https://doi.org/10.1201/b11267-44>
- Ritchie, H. (2021). *Do we only have 60 harvests left?* Our World in Data. Retrieved 20 September, 2021, from <https://ourworldindata.org/soil-lifespans>
- Rittel, H., & Weber, M. (1973). Dilemmas in a general theory of planning. *Policy Sciences*, 4(2), 155–169.
- Rivera-Ferre, M. G. (2018). The resignification process of Agroecology: Competing narratives from governments, civil society and intergovernmental organizations. *Agroecology and Sustainable Food Systems*, 42(6), 666–685. <https://doi.org/10.1080/21683565.2018.1437498>
- Robertson, M. (2012). Measurement and alienation: Making a world of ecosystem services. *Transactions of the Institute of British Geographers*, 37(3), 386–401. <https://doi.org/10.1111/j.1475-5661.2011.00476.x>
- Robinson, D. A., Fraser, I., Dominati, E., Davídsdóttir, B., Jónsson, J. Ö. G., Jones, L., Jones, S. B., Tuller, M., Lebron, I., Bristow, K. L., Souza, D. M., Banwart, S., & Clothier, B. E. (2014). On the value of soil resources in the context of natural capital and ecosystem service delivery. *Soil Science Society of America Journal*, 78(3), 685–700. <https://doi.org/10.2136/sssaj2014.01.0017>
- Robinson, D. A., Hockley, N., Cooper, D. M., Emmett, B. A., Keith, A. M., Lebron, I., Reynolds, B., Tipping, E., Tye, A. M., Watts, C. W., Whalley, W. R., Black, H. I. J., Warren, G. P., & Robinson, J. S. (2012). Natural capital and ecosystem

- services, developing an appropriate soils framework as a basis for valuation. *Soil Biology and Biochemistry*, 57, 1023–1033.
<https://doi.org/10.1016/j.soilbio.2012.09.008>
- Robinson, D. A., Lebron, I., & Vereecken, H. (2009). On the definition of the natural capital of soils: A framework for description, evaluation, and monitoring. *Soil Science Society of America Journal*, 73(6), 1904–1911.
<https://doi.org/10.2136/sssaj2008.0332>
- Robinson, D. A., Seaton, F., Sharps, K., Thomas, A., Parry Roberts, F., Van Der Ploeg, M., Jones, L., Stolte, J., Puig de la Bellacasa, M., Harrison, P., & Emmett, B. (2017). Soil resources, the delivery of ecosystem services and value. *Oxford Research Encyclopedia of Environmental Science*.
<https://doi.org/10.1093/acrefore/9780199389414.013.375>
- Rocha, J. C., Baraibar, M. M., Deutsch, L., de Bremond, A., Oestreicher, J. S., Rositano, F., & Gelabert, C. C. (2019). Toward understanding the dynamics of land change in Latin America: Potential utility of a resilience approach for building archetypes of land-systems change. *Ecology and Society*, 24(1).
<https://doi.org/10.5751/ES-10349-240117>
- Rocheftort, D., & Cobb, R. W. (1993). Problem definition, agenda access and policies. *Policy Studies Journal*, 21(1), 56–71. <https://doi.org/10.1111/j.1541-0072.1993.tb01453.x>
- Rockström, J., Steffen, W., Noone, K., Persson, Å., Chapin, F. S., Lambin, E. F., Lenton, T. M., Scheffer, M., Folke, C., Schellnhuber, H. J., Nykvist, B., De Wit, C. A., Hughes, T., Van Der Leeuw, S., Rodhe, H., Sörlin, S., Snyder, P. K., Costanza, R., Svedin, U., ... Foley, J. A. (2009). A safe operating space for humanity. *Nature*, 461(7263), 472–475. <https://doi.org/10.1038/461472a>
- Roe, E. (1994). *Narrative policy analysis theory and practice*. Duke University Press.
- Roe, E. (2013). *Making the most of mess: Reliability and policy in today's management challenges*. Duke University Press.
- Roemer, J. E. (1996). *Theories of distributive justice*. Harvard University Press.
- Rolston III, H. (1988). *Environmental ethics: Duties to and values in the natural world*. Temple University Press.
- Römbke, J., Breure, A. M., Mulder, C., & Rutgers, M. (2005). Legislation and ecological quality assessment of soil: Implementation of ecological indication systems in Europe. *Ecotoxicology and Environmental Safety*, 62(2), 201–210.
<https://doi.org/10.1016/j.ecoenv.2005.03.023>
- Rose, D. C., Mukherjee, N., Simmons, B. I., Tew, E. R., Robertson, R. J., Vadrot, A. B. M., Doubleday, R., & Sutherland, W. J. (2017). Policy windows for the environment: Tips for improving the uptake of scientific knowledge. *Environmental Science and Policy*, 113, 47–54.
<https://doi.org/10.1016/j.envsci.2017.07.013>

- Rosenthal, I. (2019). Ontology and political theory: A critical encounter between Rawls and Foucault. *European Journal of Political Theory*, 18(2), 238–258. <https://doi.org/10.1177/1474885116659633>
- Saar, M. (2012). What is political ontology? *Krisis Journal for Contemporary Philosophy*, (1), 79–83. <https://archive.krisis.eu/wp-content/uploads/2017/12/krisis-2012-1-09-saar.pdf>
- Salazar, J. F., Granjou, C., Krzywoszynska, A., Tironi, M., & Kearnes, M. (2020). Thinking-with Soils: An Introduction. In J. F. Salazar, C. Granjou, M. Kearnes, A. Krzywoszynska, & M. Tironi (Eds.), *Thinking with soils: Material politics and social theory* (pp. 1–13). Bloomsbury Publishing.
- Saldaña, J. (2009). *The coding manual for qualitative researchers*. SAGE.
- Salt, D. (2016). A brief history of agri-environment policy in Australia: From community-based NRM to market-based instruments. In D. Ansell, F. Gibson, & D. Salt (Eds.), *Learning from agri-environment schemes in Australia: Investing in biodiversity and other ecosystem services on farms* (pp. 91–105). ANU Press. <https://doi.org/10.22459/lfaesa.05.2016.07>
- Samarasinghe, O., Greenhalgh, S., & Vesely, É.-T. (2013). *Looking at soils through the natural capital and ecosystem services lens*. Manaaki Whenua Press.
- Sandel, M. (1982). *Liberalism and the limits of justice*. Cambridge University Press.
- Sandler, R. (2012). Intrinsic value, ecology, and conservation. *Nature Education Knowledge*, 3(10), 4.
- Sartori, M., Philippidis, G., Ferrari, E., Borrelli, P., Lugato, E., Montanarella, L., & Panagos, P. (2019). A linkage between the biophysical and the economic: Assessing the global market impacts of soil erosion. *Land Use Policy*, 86, 299–312. <https://doi.org/10.1016/j.landusepol.2019.05.014>
- Saurugger, S. (2016). Constructivism and agenda setting. In N. Zahariadis (Ed.), *Handbook of Public Policy Agenda Setting* (pp. 132–153). Edward Elgar Publishing. <https://doi.org/10.4337/9781784715922>
- Sawchik, J., Pérez-Bidegain, M., & García, C. (2012). Impact of winter cover crops on soil properties under soybean cropping systems. *Agrociencia Uruguay*, 16(3), 288–293.
- Schattschneider, E. E. (1960). *The Semisovereign people: A realist's view of democracy in America*. Holt, Rinehart and Winston.
- Schlosberg, D. (2004). Reconceiving environmental justice: Global movements and political theories. *Environmental Politics*, 13(3), 517–540. <https://doi.org/10.1080/0964401042000229025>
- Schlosberg, D. (2007). *Defining environmental justice: Theories, movements, and nature*. Oxford University Press.
- Schlosberg, D. (2012). Justice, ecological integrity, and climate change. In A. Thompson & J. Bendik-Keymer (Eds.), *Ethical adaptation to climate change*:

- Human virtues of the future* (pp. 165–183). MIT Press.
<https://doi.org/10.7551/mitpress/9780262017534.001.0001>
- Schlosberg, D. (2014). Ecological justice for the Anthropocene. In M. Wissenburg & D. Schlosberg (Eds.), *Political animals and animal politics* (pp. 75–89). Palgrave Macmillan. <https://doi.org/10.1007/978-1-349-68308-6>
- Schlosberg, D. (2019, June 28). *An ethic of ecological justice for the Anthropocene*. ABC Religion & Ethics. <https://www.abc.net.au/religion/an-ethic-of-ecological-justice-for-the-anthropocene/11246010>
- Schmidt, V. A. (2010). Taking ideas and discourse seriously: Explaining change through discursive institutionalism as the fourth “new institutionalism”. *European Political Science Review*, 2(1), 1–25.
<https://doi.org/10.1017/S175577390999021X>
- Schoknecht, N. (2010, August 1–10). *Soil policy development in Australia* [Paper presentation]. 19th World Congress of Soil Science, Soils Solutions for a Changing World, Brisbane, Australia. Retrieved 10 June, 2018, from <https://www.iuss.org/19th%20WCSS/Symposium/pdf/2172.pdf>
- Scholes, R., Montanarella, L., Brainich, A., Barger, N., ten Brink, B., Cantele, M., Erasmus, B., Fisher, J., Gardner, T., Holland, T., Kohler, F., Kotiaho, J., Von Maltitz, G., Nangendo, G., Pandit, R., Parrotta, J., Potts, M., Prince, S., Sankaran, M., & Willemen, L. (2018). *Summary for policymakers of the thematic assessment report on land degradation and restoration of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*. <https://doi.org/10.5281/zenodo.3237392>
- Schön, D., & Rein, M. (1994). *Frame reflection: Toward the resolution of intractable policy controversies*. New York: Basic Books.
- Schröter, M., Van Der Zanden, E. H., Van Oudenhoven, A. P. E., Remme, R. P., Serna-Chavez, H. M., De Groot, R., & Opdam, P. (2014). Ecosystem services as a contested concept: A synthesis of critique and counterarguments. *Conservation Letters*, 7(6), 514–523. <https://doi.org/10.1111/conl.12091>
- Schwandt, T. (1994). Constructivist, interpretivist approaches to human inquiry. In N. K. Denzin & Y. S. Lincoln (Eds.) *Handbook of Qualitative Research* (pp. 118–137). SAGE.
- Schwartz-Shea, P., & Yanow, D. (2012). *Interpretive research design: Concepts and processes*. Routledge.
- Schweitzer, A. (1987). *The Philosophy of Civilization*. Prometheus Books.
- Scoones, I. (2015). Transforming soils: Transdisciplinary perspectives and pathways to sustainability. *Current Opinion in Environmental Sustainability*, 15, 20–24. <https://doi.org/10.1016/j.cosust.2015.07.007>
- Scoones, I., Hall, R., Borrás, S., White, B., & Wolford, W. (2013). The politics of evidence: Methodologies for understanding the global land rush. *Journal of Peasant Studies*, 40(3), 469–483. <https://doi.org/10.1080/03066150.2013.801341>

- Scoones, I., & Stirling, A. (Eds.). (2020). *The politics of uncertainty: Challenges of transformation*. Routledge. <https://doi.org/10.4324/9781003023845>
- Searchinger, T., & Ranganathan, J. (2020). *Insider: Further explanation on the potential contribution of soil carbon sequestration on working agricultural lands to climate change mitigation*. World Resources Institute. Retrieved 31 March, 2021, from <https://www.wri.org/blog/2020/08/insider-further-explanation-potential-contribution-soil-carbon-sequestration-working>
- Sen, A. (2001). *Development as Freedom*. Oxford University Press.
- Shikongo, S. (2017). Greeting to the launch of the yearbook from an African perspective. In H. Ginzky, I. Heuser, T. Qin, O. Ruppel, & P. Wegerdt (Eds.), *International Yearbook of Soil Law and Policy 2016* (pp. 3–8). Springer. <https://doi.org/10.1007/978-3-319-42508-5>
- Shiva, V. (2016). *Soil, not oil: Climate change, peak oil and food insecurity*. Bloomsbury Publishing. <https://doi.org/10.1017/So814062600000501>
- Simon, H. A. (1973). The structure of ill structured problems. *Artificial Intelligence*, 4, 181–201.
- Singer, P. (1975). *Animal Liberation: A new ethics for our treatment of animals*. Random House.
- Smith, P., House, J., Bustamante, M., Sobocká, J., Harper, R., Pan, G., West, P., Clark, J., Adhya, T., Rumpel, C., Paustian, K., Kuikman, P., Cotrufo, M., Elliott, J., McDowell, R., Griffiths, R., Asakawa, S., Bondeau, A., Jain, A., ... Pugh, T. (2016). Global change pressures on soils from land use and management. *Global Change Biology*, 22(3), 1008–1028. <https://doi.org/10.1111/gcb.13068>
- Snow, D. A., & Bedford, R. D. (2000). Framing processes and social movements: An overview and assessment. *Annual Review of Sociology*, 26(1974), 611–639. <http://www.jstor.org/stable/223459>
- Soil Cooperative Research Centre for High Performance Soils. (n.d.). *About Soil CRC*. Retrieved 25 May, 2021, from <https://soilcrc.com.au/about/>
- Sonneveld, B. G. J. S., & Dent, D. L. (2009). How good is GLASOD? *Journal of Environmental Management*, 90(1), 274–283. <https://doi.org/10.1016/j.jenvman.2007.09.008>
- Sørensen, E., & Torfing, J. (Eds.). (2007). *Theories of democratic network governance*. Palgrave Macmillan. <https://doi.org/10.1057/9780230625006>
- Soss, J. (2014). Talking our way to meaningful explanations: A practice-centered view of interviewing for interpretive research. In D. Yanow & P. Schwartz-Shea (Eds.), *Interpretation and Method: Empirical research methods and the interpretive turn* (2nd ed.) (pp. 161–182). Routledge. <https://doi.org/10.4324/9781315703275>

- Sparling, G. (2006). Quality indicators. In R. Lal (Ed.), *Encyclopedia of Soil Science* (2nd ed.) (pp. 1408–1411). Taylor & Francis.
- Srinivasan, K., & Cochrane, A. (2020). Justice, conflict and shared vulnerabilities in a multispecies world. *Contemporary Political Theory*, 19, 487–491.
- Srinivasan, K., & Kasturirangan, R. (2016). Political ecology, development, and human exceptionalism. *Geoforum*, 75, 125–128.
<https://doi.org/10.1016/j.geoforum.2016.07.011>
- Stankovics, P., Montanarella, L., Kassai, P., Tóth, G., & Tóth, Z. (2020). The interrelations of land ownership, soil protection and privileges of capital in the aspect of land take. *Land Use Policy*, 99, 105071.
<https://doi.org/10.1016/j.landusepol.2020.105071>
- Stavi, I., & Lal, R. (2015). Achieving Zero Net Land Degradation: Challenges and opportunities. *Journal of Arid Environments*, 112, 44–51.
<https://doi.org/10.1016/j.jaridenv.2014.01.016>
- Steffen, W., Grinevald, J., Crutzen, P., & McNeill, J. (2011). The Anthropocene: Conceptual and historical perspectives. *Philosophical Transactions of the Royal Society. Series A: Mathematical, Physical and Engineering Sciences*, 369 (1938), 842–867. <https://doi.org/10.1098/rsta.2010.0327>
- Steffen, W., Richardson, K., Rockström, J., Cornell, S. E., Fetzer, I., Bennett, E. M., Biggs, R., Carpenter, S. R., De Vries, W., De Wit, C. A., Folke, C., Gerten, D., Heinke, J., Mace, G. M., Persson, L. M., Ramanathan, V., Reyers, B., & Sörlin, S. (2015). Planetary boundaries: Guiding human development on a changing planet. *Science*, 347(6223), p.1259855-1259855.
<https://doi.org/10.1126/science.1259855>
- Steger, M., Goodman, J., & Wilson, E. K. (2012). *Justice globalism: Ideology, crises, policy*. SAGE. <https://dx.doi.org/10.4135/9781446270080>
- Stone, D. (1988). *Policy paradox and political reason*. Scott Foresman & Co.
- Stone, D. (1989). Causal stories and the formation of policy agendas. *Political Science Quarterly*, 104(2), 281–300. <https://doi.org/10.2307/2151585>
- Strang, V. (2017). Justice for all: inconvenient truths and reconciliation in human-non-human relations. In H. Kopnina & E. Shoreman-Ouimet (Eds.), *Routledge Handbook of Environmental Anthropology* (pp. 259–275). Routledge. <https://doi.org/10.4324/9781315768946>
- Strauss, A., & Corbin, J. (1998). *Basics of qualitative research: Techniques and procedures for developing Grounded Theory* (2nd ed.). SAGE.
- Stronge, D. C., Stevenson, B. A., Harmsworth, G. R., & Kannemeyer, R. L. (2020). A well-being approach to soil health-insights from Aotearoa New Zealand. *Sustainability (Switzerland)*, 12(18), 1–12. <https://doi.org/10.3390/su12187719>

- Suddaby, R. (2006). From the Editors: What Grounded Theory is not. *Academy of Management Journal*, 49(4), 633–642.
<https://doi.org/10.5465/amj.2006.22083020>
- Sustainable Soils Alliance. (2018). *About Soils*. Retrieved 16 September, 2019, from
<https://www.sustainablesoils.org/about-soils>
- Svampa, M. (2015). Commodities consensus: Neoextractivism and enclosure of the commons in Latin America. *South Atlantic Quarterly*, 114(1), 65–82.
<https://doi.org/10.1215/00382876-2831290>
- Swyngedouw, E. (2007). Impossible “sustainability” and the post-political condition. In D. Gibbs & R. Krueger (Eds.), *The Sustainable Development Paradox* (pp. 13–40). Guilford Press.
- Swyngedouw, E. (2011). Depoliticized Environments: The end of nature, climate change and the post-political condition. *Royal Institute of Philosophy Supplement*, 69(October 2011), 253–274.
<https://doi.org/10.1017/S1358246111000300>
- Swyngedouw, E. (2013). Apocalypse now! Fear and doomsday pleasures. *Capitalism, Nature, Socialism*, 24(1), 9–18.
<https://doi.org/10.1080/10455752.2012.759252>
- Swyngedouw, E. (2015). Depoliticization (“The Political”). In G. D’Alisa, F. Demaria, & G. Kallis (Eds.), *Degrowth: A vocabulary for a new era* (pp. 90–93). Routledge. <https://doi.org/10.4324/9780203796146>
- Swyngedouw, E. (2016). Unlocking the mind-trap: Politicising urban theory and practice. *Urban Studies*, 54(1), 55–61.
<https://doi.org/10.1177/0042098016671475>
- Swyngedouw, E., & Ernstson, H. (2018). Interrupting the Anthro-po-obScene: Immuno-biopolitics and depoliticizing ontologies in the Anthropocene. *Theory, Culture and Society*, 35(6), 3–30.
<https://doi.org/10.1177/0263276418757314>
- Tanasescu, M. (2014). The Rights of Nature: Theory and Practice. In M. Wissenburg & D. Schlosberg (Eds.), *Political Animals and Animal Politics*. (pp. 150–163). Palgrave Macmillan. <https://doi.org/10.1007/978-1-349-68308-6>
- Tanasescu, M. (2017). When a river is a person: from Ecuador to New Zealand, nature gets its day in court. *Open Rivers: Rethinking Water, Place and Community*, 8(fall 2017). <https://openrivers.lib.umn.edu/article/when-a-river-is-a-person-from-ecuador-to-new-zealand-nature-gets-its-day-in-court/#:~:text=In%20the%20early%202000s%2C%20the,was%20recently%20granted%20human%20rights.>
- Taylor, P. (1986). *Respect for nature: A theory of environmental ethics* (25th anniversary ed.). Princeton University Press.

- The Economics of Ecosystems and Biodiversity. (2009). *Report: Climate issues update*. <http://www.teebweb.org/media/2009/09/TEEB-Climate-Issues-Update.pdf>
- Tennent, R., & Lockie, S. (2013). Vale Landcare: the rise and decline of community-based natural resource management in rural Australia. *Journal of Environmental Planning and Management*, 56(4), 572–587. <https://doi.org/10.1080/09640568.2012.689617>
- Termorshuizen, J. W., & Opdam, P. (2009). Landscape services as a bridge between landscape ecology and sustainable development. *Landscape Ecology*, 24(8), 1037–1052. <https://doi.org/10.1007/s10980-008-9314-8>
- Thompson, P. (2008). Agrarian philosophy and ecological ethics. *Science and Engineering Ethics*, 14(4), 527–544. <https://doi.org/10.1007/s11948-008-9094-1>
- Thompson, P. B. (2017). *The spirit of the soil: Agriculture and environmental ethics*. Taylor & Francis. <https://doi.org/10.4324/9781315559971>
- Toman, M. (1998). Special section: Forum on valuation of Ecosystem Services: Why not to calculate the value of the world's ecosystem services and natural capital. *Ecological Economics*, 25(1), 57–60. [https://doi.org/10.1016/S0921-8009\(98\)00017-2](https://doi.org/10.1016/S0921-8009(98)00017-2)
- Torring, J. (2009). Power and Discourse: Towards an anti-foundationalist concept of power. In S. R. Clegg & M. Haugaard (Eds.), *The Sage Handbook of Power* (pp. 108–124). SAGE.
- Tozer, P., & Leys, J. (2013). Dust storms: What do they really cost? *Rangeland Journal*, 35(2), 131–142. <https://doi.org/10.1071/RJ12085>
- Triandafyllidou, A., & Fotiou, A. (1998). Sustainability and modernity in the European Union: A frame theory approach to policymaking. *Sociological Research Online*, 3(1), 1–22. <https://doi.org/10.5153/sro.99>
- Tronto, J. C. (1993). *Moral Boundaries: A political argument for an ethic of care*. Routledge.
- Tschakert, P., Schlosberg, D., Celermajer, D., Rickards, L., Winter, C., Thaler, M., Stewart-Harawira, M., & Verlie, B. (2021). Multispecies justice: Climate-just futures with, for and beyond humans. *Wiley Interdisciplinary Reviews: Climate Change*, 12(2). <https://doi.org/10.1002/WCC.699>
- Turgeon, J., & Savard, J. F. (2012). Public Policy. In L. Côté and J. F. Savard (Eds.), *Encyclopedic Dictionary of Public Administration*. https://dictionnaire.enap.ca/Dictionnaire/17/Index_par_mot.enap?by=word&id=14
- Turnbull, N. (2006). How should we theorise public policy? Problem solving and problematcity. *Policy and Society*, 25(2), 3–22. [https://doi.org/10.1016/S1449-4035\(06\)70072-8](https://doi.org/10.1016/S1449-4035(06)70072-8)

- Turnbull, N., & Hoppe, R. (2018). Problematizing 'wickedness': A critique of the wicked problems concept, from philosophy to practice. *Policy and Society*, 38(2), 315–337. <https://doi.org/10.1080/14494035.2018.1488796>
- Turnhout, E., Waterton, C., Neves, K., & Buizer, M. (2013). Rethinking biodiversity: From goods and services to “living with.” *Conservation Letters*, 6(3), 154–161. <https://doi.org/10.1111/j.1755-263X.2012.00307.x>
- Tzilivakis, J., Lewis, K. A., & Williamson, A. R. (2005). A prototype framework for assessing risks to soil functions. *Environmental Impact Assessment Review*, 25(2), 181–195. <https://doi.org/10.1016/j.eiar.2004.02.003>
- United Nations. (2011). *The global social crisis: Report on the world social situation 2011*. <https://www.un.org/esa/socdev/rwss/docs/2011/rwss2011.pdf>
- United Nations. (2012). *The future we want? Outcome document of the United Nations Conference on Sustainable Development*. <https://sustainabledevelopment.un.org/content/documents/733FutureWeWant.pdf>
- United Nations. (2021). *About the UN decade*. United Nations decade on ecosystems restoration 2021-2030. Retrieved 13 May, 2021, from <https://www.decadeonrestoration.org/about-un-decade>
- United Nations Convention to Combat Desertification. (2011). *Submission by the United Nations Convention to Combat Desertification on decision 6/CP.17 containing views on elements to be potentially included as future areas of work of the Nairobi Work Programme (NWP): The role of the UNCCD convention (Parties and secretariat) in holistically addressing the issues of Sustainable Land Management (SLM) and the implications of recurrent droughts to the long term objectives of the NWP*. <https://unfccc.int/resource/docs/2012/smsn/igo/99.pdf>
- United Nations Convention to Combat Desertification. (2015). *Report of the Conference of the Parties on its twelfth session*. <https://www.unccd.int/official-documents/cop-12-ankara-2015/iccdcop122oadd1>
- Uruguay XXI. (2020). *Sectorial Report Agribusiness*. <https://www.uruguayxxi.gub.uy/uploads/informacion/5affd26dce2ca92a70636927a5d83c410bbddf85.pdf>
- Van Den Hove, S. (2007). A rationale for science-policy interfaces. *Futures*, 39(7), 807–826. <https://doi.org/10.1016/j.futures.2006.12.004>
- Van Der Meer, F. B., & Edelenbos, J. (2006). Evaluation in multi-actor policy processes: accountability, learning and co-operation. *Evaluation*, 12(2), 201–218. <https://doi.org/10.1177/13563890060666972>
- Van Dijk, T. A. (1993). Principles of critical discourse analysis. *Discourse & Society*, 4(2), 249–283. <https://doi.org/10.1177/0957926593004002006>

- Van Hulst, M., & Yanow, D. (2016). From policy “frames” to “framing”: Theorizing a more dynamic, political approach. *American Review of Public Administration*, 46(1), 92–112. <https://doi.org/10.1177/0275074014533142>
- Vandermause, R. K., & Fleming, S. E. (2011). Philosophical hermeneutic interviewing. *International Journal of Qualitative Methods*, 10(4), 367–377. <https://doi.org/10.1177/160940691101000405>
- Vatn, A. (2007). *Institutions and the Environment*. Edward Elgar Publishing.
- Vatn, A., & Bromley, D. W. (1994). Choices without prices without apologies. *J. Environ. Econ. Manage.*, 26, 129–148. <https://doi.org/10.1006/jeem.1994.1008>
- Veerman, C., Pinto Correia, T., Bastioli, C., Biro, B., Bouma, J., Cienciala, E., Emmett, B., Frison, E. A., Grand, A., Hristov, L., Kriaučiūnienė, Z., Pogrzeba, M., Soussana, J. F., Vela, C., & Wittkowski, R. (2020). *Caring for soil is caring for life: ensure 75% of soils are healthy by 2030 for healthy food, people, nature and climate*. European Commission.
- VeneKlasen, L., & Miller, V. (2007). *A new wave of power, people & politics: The action guide for advocacy and citizen participation*. World Neighbors.
- Vermeulen, S., Bossio, D., Lehmann, J., Luu, P., Paustian, K., Webb, C., Augé, F., Bacudo, I., Baedeker, T., Havemann, T., Jones, C., King, R., Reddy, M., Sunga, I., Von Unger, M., & Warnken, M. (2019). A global agenda for collective action on soil carbon. *Nature Sustainability*, 2(1), 2–4. <https://doi.org/10.1038/s41893-018-0212-z>
- Vesely, A. (2007). Problem delimitation in public policy analysis. *Central European Journal of Public Policy*, 1(1), 80–100.
- Vink, M. J., Boezeman, D., Dewulf, A., & Termeer, C. J. A. M. (2013). Changing climate, changing frames: Dutch water policy frame developments in the context of a rise and fall of attention to climate change. *Environmental Science and Policy*, 30, 90–101. <https://doi.org/10.1016/j.envsci.2012.10.010>
- Viriasova, I. (2011). Politics and the Political: Correlation and the question of the unpolitical. *Journal of Relational Politics*, 1(1), 1–14.
- Vliegthart, R., & Van Zoonen, L. (2011). Power to the frame: Bringing sociology back to frame analysis. *European Journal of Communication*, 26(2), 101–115. <https://doi.org/10.1177/0267323111404838>
- Von Glasersfeld, E. (1995). *Radical Constructivism: A way of knowing and learning* (1st ed.). Routledge.
- Voulvoulis, N., & Burgman, M. A. (2019). The contrasting roles of science and technology in environmental challenges. *Critical Reviews in Environmental Science and Technology*, 49(12), 1079–1106. <https://doi.org/10.1080/10643389.2019.1565519>
- Vrebos, D., Bampa, F., Creamer, R. E., Gardi, C., Ghaley, B. B., Jones, A., Rutgers, M., Sandén, T., Staes, J., & Meire, P. (2017). The impact of policy instruments

- on soil multifunctionality in the European Union. *Sustainability (Switzerland)*, 9(3), 1–18. <https://doi.org/10.3390/su9030407>
- Wagenaar, H. (2014). *Meaning in action: Interpretation and dialogue in policy analysis*. Routledge. <https://doi.org/10.4324/9781315702476>
- Wall, D., & Six, J. (2015). Give soils their due. *Science*, 347(6223), 695. <https://doi.org/10.1126/science.aaa8493>
- Walzer, M. (1983). *Spheres of Justice: A defense of pluralism and equality*. Basic Books.
- Wapner, P. (2019). The Ethics of Political Research in the Anthropocene. In F. Biermann & E. Lövbrand (Eds.), *Anthropocene encounters: New directions in green political thinking* (pp. 212–227). Cambridge University Press. <https://doi.org/10.1017/9781108646673>
- Ward, P., & Siddique, K. H. M. (2015). Conservation agriculture in Australia and New Zealand. In M. Farooq & Siddique, K. H. M. (Eds.), *Conservation agriculture* (pp. 335–355). Springer. <https://doi.org/10.1007/978-3-319-11620-4>
- Washington, H., Chapron, G., Kopnina, H., Curry, P., Gray, J., & Piccolo, J. J. (2018). Foregrounding ecojustice in conservation. *Biological Conservation*, 228, 367–374. <https://doi.org/10.1016/j.biocon.2018.09.011>
- Waters, C. N., Zalasiewicz, J., Summerhayes, C., Barnosky, A. D., Poirier, C., Gałuszka, A., Cearreta, A., Edgeworth, M., Ellis, E. C., Ellis, M., Jeandel, C., Leinfelder, R., McNeill, J. R., Richter, D., Steffen, W., Syvitski, J., Vidas, D., Wapner, M., Williams, M., ... Wolfe, A. P. (2016). The Anthropocene is functionally and stratigraphically distinct from the Holocene. *Science*, 351(6269), 137–147. <https://doi.org/10.1126/science.aad2622>
- Webb, A., Kelly, G., & Dougherty, W. (2015). Soil governance in the agricultural landscapes of New South Wales, Australia. *International Journal of Rural Law and Policy*, 1, 1–16. <https://doi.org/10.5130/ijrlp.v1i1.4169>
- Weigelt, J., Müller, A., Beckh, Ch., Srigiri, S., & Töpfer, K. (2013). *Pathways towards sustainable soil and land governance: Discussing the contribution of the Global Soil Week* [Working paper]. Institute for Advanced Sustainability Studies. https://publications.iass-potsdam.de/rest/items/item_321311_8/component/file_385214/content
- Weigelt, J., Müller, A., Janetschek, H., & Töpfer, K. (2015). Land and soil governance towards a transformational post-2015 development agenda: An overview. *Current Opinion in Environmental Sustainability*, 15, 57–65. <https://doi.org/10.1016/j.cosust.2015.08.005>
- Weiss, C. (1977). *Using social research in public policy making*. Lexington Books.
- Weiss, C. (1983). Ideology, interests, and information: the basis of policy positions. In D. Callahan & B. Jennings (Eds.), *Ethics, the social sciences, and policy analysis* (pp. 213–245). Springer.

- Weragoda, A., & Duver, A. (2021) Snapshot of Australian agriculture 2021. ABARES. <https://doi.org/10.25814/rxjx-3g23>
- Wesselink, A., Buchanan, K. S., Georgiadou, Y., & Turnhout, E. (2013). Technical knowledge, discursive spaces and politics at the science-policy interface. *Environmental Science and Policy*, 30, 1–9. <https://doi.org/10.1016/j.envsci.2012.12.008>
- West, S. (2016). *Meaning and action in sustainability science: Interpretive approaches for social-ecological systems research* [Doctoral dissertation, Stockholm Resilience Centre, Stockholm University]. Digitala Vetenskapliga Arkivet. <https://www.diva-portal.org/smash/get/diva2:1045327/FULLTEXT01.pdf>
- West, S., Haider, L. J., Stålhammar, S., & Woroniecki, S. (2020). A relational turn for sustainability science? Relational thinking, leverage points and transformations. *Ecosystems and People*, 16(1), 304–325. <https://doi.org/10.1080/26395916.2020.1814417>
- Whatmore, S. (2013). Earthly powers and affective environments: An ontological politics of flood risk. *Theory, Culture & Society*, 30(8), 33–50. <https://doi.org/10.1177/0263276413480949>
- White, R. (2008). *Crimes against nature: Environmental criminology and ecological justice*. Willan Publishing.
- White, R. E., & Davidson, B. (2020, August 17). *Dishing the dirt: Australia's move to store carbon in soil is a problem for tackling climate change*. The Conversation. <https://theconversation.com/dishing-the-dirt-australias-move-to-store-carbon-in-soil-is-a-problem-for-tackling-climate-change-141656>
- Wienhues, A. (2020). *Ecological justice and the extinction crisis: Giving living beings their due*. Bristol University Press. <https://doi.org/10.2307/j.ctv16t671c>
- Willemsen, M. C. (2018). *Tobacco control policy in The Netherlands: Between economy, public health, and ideology*. Springer Open. <https://doi.org/10.1007/978-3-319-72368-6>
- Williams, J. (2015). Soil governance in Australia: Challenges of cooperative federalism. *International Journal of Rural Law and Policy*, 1, 40–51. <https://doi.org/10.5130/ijrlp.i1.2015.4173>
- Williams, M., Zalasiewicz, J., Haff, P. K., Schwägerl, C., Barnosky, A. D., & Ellis, E. C. (2015). The Anthropocene biosphere. *Anthropocene Review*, 2(3), 196–219. <https://doi.org/10.1177/2053019615591020>
- Wilson, J., & Swyngedouw, E. (2014). Seeds of dystopia: Post-politics and the return of the political. In J. Wilson & E. Swyngedouw (Eds.), *The post-political and its discontents: Spaces of depoliticisation, spectres of radical politics* (pp. 1–22). Edinburgh University Press. <https://doi.org/10.3366/edinburgh/9780748682973.003.0001>

- Wilson, N., Harris, L., Nelson, J., & Shah, S. (2019). Re-theorizing politics in water governance. *Water*, 11(7), 1–13. <https://doi.org/10.3390/w11071470>
- Windfuhr, M. (2017). FAO: Voluntary guidelines on responsible governance of tenure of land, forests and fisheries: Relevance, reception and first experiences in implementation. In H. Ginzky, I. Heuser, T. Qin, O. Ruppel, & P. Wegerdt (Eds.), *International Yearbook of Soil Law and Policy 2016* (pp. 203–2018). Springer. <https://doi.org/10.1007/978-3-319-42508-5>
- Wischmeier, W. H., & Smith, D. D. (1978). Predicting rainfall erosion losses: a guide to conservation planning. *Supersedes Agricultural Handbook No282*, USDA. <https://naldc.nal.usda.gov/download/CAT79706928/PDF>
- Wolfe, M., Jones, B. D., & Baumgartner, F. R. (2013). A failure to communicate: Agenda setting in media and policy studies. *Political Communication*, 30(2), 175–192. <https://doi.org/10.1080/10584609.2012.737419>
- Wong, J. (2019, May 8). *The idea that there are only 100 harvests left is just a fantasy*. New Scientist. <https://www.newscientist.com/article/mg24232291-100-the-idea-that-there-are-only-100-harvests-left-is-just-a-fantasy/>
- Wood, M. (2015). Puzzling and powering in policy paradigm shifts: politicization, depoliticization and social learning. *Critical Policy Studies*, 9(1), 2–21. <https://doi.org/10.1080/19460171.2014.926825>
- Wood, M. (2016). Politicisation, depoliticisation and anti-politics: Towards a multilevel research agenda. *Political Studies Review*, 14(4), 521–533. <https://doi.org/10.1111/1478-9302.12074>
- Wood, M., & Flinders, M. (2014). Rethinking depoliticisation: Beyond the governmental. *Policy and Politics*, 42(2), 151–170.
- Wordie, J. R. (1983). The chronology of English enclosure, 1500–1914. *Economic History Review*, 36(4), 483–505.
- Workman, S., Jones, B. D., & Jochim, A. E. (2009). Information processing and policy dynamics. *Policy Studies Journal*, 37(1), 75–92. <https://doi.org/10.1111/j.1541-0072.2008.00296.x>
- World Bank. (2017). *Sustainable Management of Natural Resources and Climate Change Project*. Retrieved 2 March, 2022, from <https://documents1.worldbank.org/curated/en/524951468126548655/pdf/IntegratedoSafoetoooAppraisalStage.pdf>
- World Wide Fund for Nature International. (2016). Living planet report: risk and resilience in a new era. https://awsassets.panda.org/downloads/lpr_2016_full_report_low_res.pdf
- Wyatt, A. M. (2008). The dirt on international environmental law regarding soils: Is the existing regime adequate? *Duke Environmental Law and Policy Forum*, 19(1), 165–207.

- Yaka, Ö. (2019). Rethinking justice: Struggles for environmental commons and the notion of socio-ecological justice. *Antipode*, 51(1), 353–372.
<https://doi.org/10.1111/anti.12422>
- Yanow, D. (1996). *How does a policy mean? Interpreting policy and organizational actions*. Georgetown University Press.
- Yanow, D. (1999). *Conducting Interpretive Policy Analysis*. SAGE.
- Yanow, D., & Schwartz-Shea, P. (2014). Doing social science in a humanistic manner. In D. Yanow & P. Schwartz-Shea (Eds.), *Interpretation and Method: Empirical research methods and the interpretive turn* (2nd ed.) (pp. 433–447). Routledge. <https://doi.org/10.4324/9781315703275>
- Yin, R. K. (2009). *Case study research, design and method* (4th ed.). SAGE.
- Young, I. M. (1990). *Justice and the Politics of Difference*. Princeton University Press.
- Young, I. M. (2010). *Responsibility for Justice*. Oxford University Press.
<https://doi.org/10.1093/acprof:oso/9780195392388.001.0001>
- Zabel, F., Delzeit, R., Schneider, J. M., Seppelt, R., Mauser, W., & Václavík, T. (2019). Global impacts of future cropland expansion and intensification on agricultural markets and biodiversity. *Nature Communications*, 10(1), 1–10.
<https://doi.org/10.1038/s41467-019-10775-z>
- Zahariadis, N. (2016). Setting the agenda on agenda setting: Definitions, concepts, and controversies. In N. Zahariadis (Ed.), *Handbook of Public Policy Agenda Setting* (pp. 1–22). Edward Elgar Publishing.
- Zalasiewicz, J., Waters, C. N., Ellis, E. C., Head, M. J., Vidas, D., Steffen, W., Thomas, J. A., Horn, E., Summerhayes, C. P., Leinfelder, R., McNeill, J. R., Gałuszka, A., Williams, M., Barnosky, A. D., Richter, D. de B., Gibbard, P. L., Syvitski, J., Jeandel, C., Cearreta, A., ... Zinke, J. (2021). The Anthropocene: comparing its meaning in geology (chronostratigraphy) with conceptual approaches arising in other disciplines. *Earth's Future*, 9(3), 1–25.
<https://doi.org/10.1029/2020ef001896>
- Zalasiewicz, J., Williams, M., Steffen, W., & Crutzen, P. (2010). The new world of the Anthropocene. *Environmental Science and Technology*, 2228(2231), 8703–8704.
- Zittoun, P. (2014). *The political process of policymaking. A pragmatic approach to public policy*. Palgrave Macmillan.
- Zittoun, P. (2016). The domestication of a “wild” problem: taming policy agenda setting. In N. Zahariadis (Ed.), *Handbook of Public Policy Agenda Setting* (pp. 254–272). Edward Elgar Publishing.
- Žižek, S. (1999). *The ticklish subject: The absent centre of political ontology*. Verso.

- Zomer, R. J., Bossio, D. A., Sommer, R., & Verchot, L. V. (2017). Global sequestration potential of increased organic carbon in cropland soils. *Scientific Reports*, 7(1), 1–8. <https://doi.org/10.1038/s41598-017-15794-8>
- Zurbriggen, C., Gonzalez Lago, M., Baraibar, M., Baethgen, W., Mazzeo, N., & Sierra, M. (2020). Experimentation in the design of public policies: The Uruguayan Soils Conservation Plans. *Iberoamericana - Nordic Journal of Latin American and Caribbean Studies*, 49(1), 52–62. <https://doi.org/10.16993/iberoamericana.459>