Transnational Governing at the Climate-Biodiversity Frontier: Employing a Governmentality Perspective

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Abstract

Transnational Governance Initiatives (TGI) are increasingly recognized as central actors in the governing of climate change and biodiversity loss. Yet, their role in linking these domains has yet to be explored. As the climate crisis comes to be increasingly interlinked with the loss of biodiversity, such initiatives are increasingly combining this challenge of climate change with action on biodiversity loss through the deployment of Nature-Based Solutions (NBS), with significant consequences for the ways in which the nature problem and its solutions are framed and implemented. Employing a governmentality approach, this research reveals two overarching rationales by TGI of biodiversity as a means to climate change and biodiversity loss as 'asset-at-risk' which are rendered governable through a myriad of techniques 'at a distance' and 'in proximity'. By revealing *how* biodiversity is made to fit with the climate arena, this research finds that these governable biodiversity spaces could generate rather regrettable solutions along these shifting and unfolding climate-biodiversity frontiers.

Key words: Climate-Biodiversity Interface; Nature-Based Solutions (NBS); Governmentality; Transnational Governance; Transnational Governance Initiatives (TGI)

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1. Introduction

In the past decade, Transnational Governance Initiatives (TGI) are increasingly recognized as central actors in governing both climate change and biodiversity (Okereke et al. 2009; Negacz et al. 2020). As these crises have come to be increasingly interlinked in science and policy (Pörtner et al. 2023), TGI are becoming key players at the climate-biodiversity interface (Widerberg et al. 2022). In particular, there initial evidence suggests that TGI are seeking to govern biodiversity *through* climate change, particularly through the deployment of Nature-Based Solutions (NBS) (Bulkeley et al. 2022; Tozer et al. 2022). This paper seeks to examine how, why and with what consequences TGI are framing and deploying NBS and the implications for how climate-biodiversity governance is accomplished.

NBS have become controversial for constructing nature as a means through which to mitigate and adapt to climate change, interventions known as 'natural climate solutions'. While some suggest that NBS is an 'umbrella' concept covering a range of interventions that work with nature towards multiple goals (Cohen-Shacham et al. 2019), others point to the narrow framing of NBS in connection to climate change and the potential trade-offs in constructing nature as a means through which it can be governed (Seddon et al. 2020; Seddon et al. 2021). Critics highlight the dangers involved in focusing on the 'useful' parts of nature, the services and solutions provided by biodiversity, directing the attention away from the wider values of nature (e.g. Osaka et al. 2021; Stevenson et al. 2021). This is crucial for how biodiversity is framed and determines the ways in which NBS for climate change are designed and implemented, with potentially adverse consequences for biodiversity (Elliott 2020). For example, using trees and ecosystems for their carbon storage could draw the attention away from the need to conserve these native biodiverse ecosystems, and in fact, could negatively affect the habitats of species (Seddon et al. 2021; Wapner 2011). While these concerns on potential trade-offs with these utilitarian 'win-win' discourses such as 'ecosystem services' have been acknowledged for over a decade (Corbera 2012), we lack an understanding how biodiversity is made to *fit* with the climate agenda and what this means for its problem-solving capacity (Wapner, 2011). As NBS' forerunners (including e.g. REDD+) in the end failed to alter how we treat nature (Stevenson et al. 2021) critical questions arise whether it can prevent a similar trajectory where any conservation meaning gets lost in merging the climate-biodiversity agendas (Stevenson et al. 2022; Jinnah 2011; Wapner 2011).

Using a governmentality approach, this paper seeks to explore whether concerns about the adverse effects of bringing biodiversity into the work of governing climate change transnationally are emerging through these initiatives. Governmentality offers an alternative conceptual ground to explore *how* governing takes place compared to the more common conceptual approach of transnational governance, because in the end *how* governing takes place also determines what is governed, for whom and why – defining how climate-biodiversity governance is accomplished (Section 2). Using a database of 331 examples of TGI, the analysis focuses on a subset of twenty TGI that have focused on climate-biodiversity governance and the use of NBS (Section 3). Through this analysis the paper finds two overarching rationales through which the issue is problematized and made amenable to intervention and the practices through which biodiversity spaces are rendered governable 'at a distance' and 'in proximity' (Section 4). As the conclusions of the paper explore (Section 5), rather than being a 'natural' fit, the use of NBS within the emerging climate-biodiversity governance complex has the potential to be problematic when these are focused on the particular parts of biodiversity which matter for climate change, shaping how solutions come into being and therefore how governance is accomplished.

2. Bringing Governmentality to the Study of Transnational Governance

A large and growing body of literature considers the rise of governing through transnational networks (e.g. Andonova et al. 2009; Roger et al. 2017). These transnational networks include arrangements that 'work across the boundaries of nation-states and between public and private actors' (Bulkeley 2012, 2434). In order to structure the complex concept of transnational governance, different typologies in terms of actors, governance functions and arrangements exist in understanding who is transnationally governing what, and how. A focal point within transnational governance literature considers the typologies of governance functions (e.g. information sharing, capacity building) (Roger et al. 2017). Scholars have developed databases contributing to the systematic mapping of these typologies and identification of variation among initiatives (e.g. Negacz et al. 2020; Roger et al. 2017). Yet, whereas there is a large body of literature assessing how TGI are governing climate change or biodiversity loss (Okereke et al. 2009; Negacz et al. 2020), research on how and why these actors are increasingly governing biodiversity *through* climate governance merits further analysis. While the transnational governance approach has been useful in categorising the kinds of actors and functions of transnational governance, whether the study of these single rather generic categories can capture the multiplicity and plurality with which an analysis of the emerging climate-biodiversity governance complex should be concerned is questionable (Bulkeley et al. 2007). First, categories of functions such as sharing information and providing resources, may facilitate the governing of the issue by internalising norms to govern nature, which raises the question whether these initiatives 'all seek to shape the subjectivity of those they govern' (Bulkeley et al. 2012, 605). Whether these TGI are sharing information, or are building capacity – a common denominator is that they facilitate the governing of the issue – which raises questions whether the actual *how* is properly understood. Second, analyzing these categories as *distinct* entities will generate a rather limited understanding on what is being governed and how climate-biodiversity governance is accomplished (Miller and Rose 2008). The dominant focus on conceptual approaches such as transnational governance compared to a more critical approach – governmentality - could explain why such a climate-biodiversity governance shift has not been noticed sufficiently.

Governmentality, a conceptual perspective proposed by Foucault and since developed by multiple authors, provides a means through which to capture the multiplicity and plurality of governing. It explores the ways in which power is contested and orchestrated. Power is not a finite capacity, but rather immanent, mutually and relationally constituted, emerging from the right 'disposition of things … arranging things so that this or that end may be achieved through a certain number of means' (Foucault 2009, 99; Bulkeley and Schroeder 2012; Bulkeley 2015). This 'very specific albeit complex form of power' is not confined to states…. 'whose importance is a lot more limited than many of us think' (Foucault 1991, 142). Rather, non-state actors are also engaged in governing through the conduct of conduct (Foucault 1991, 142; Bulkeley and Schroeder 2012). TGIs are no exception. While analysis has tended to focus on the actors involved and the functions they perform in governing transnationally, this has tended to focus on questions of agency and capacity (Abbott 2012; Negacz et al. 2020) rather than on considerations of the ways in which power is generated and sustained through the work of governing transnationally. Adopting a governmentality lens draws attention to *how* governing takes place through 'governmental technologies and rationalities' (Rose et al. 2006, 99). The 'rationalities' of government, are the 'collective and taken for granted body of knowledge and styles of thinking that render aspects of reality thinkable and governable' (Lövbrand and Stripple 2013, 33; see also Chong and Druckman 2007, 104). Examining these rationalities provides 'a conceptual link between the intangible ways in which we perceive, describe, and interpret the world, and the ways in

which we act upon the world, and are in turn acted upon, through tangible practices and technologies' – pointing to the second key attribute of governmentality – techniques (Gale et al. 2017, 68). This concept refers to the 'the vast assemblage of techniques, devices, tools, instruments, materials and apparatuses that render rationalities operable' (Lövbrand and Stripple 2013, 32-33). From this perspective, certain tools and standards that are used to govern biodiversity in relation to climate, are seen as a 'technology', which in turn expresses a rationality how biodiversity should be governed (Gale et al. 2017). Accordingly, 'if political rationalities render reality into the domain of thought, these technologies of government translate thought into the domain of reality' (Miller and Rose 2008, 32). These technologies and practices affect rationalities in a two-way relationship: the extent that biodiversity is governable, depends on the technical abilities of technologies of government, which in turn 'limit the scope of what is ex-ante thinkable' (Gale et al. 2017, 78). To illustrate, Gale et al. (2017) shows how the Big Data revolution is rendering the environment visible in particular ways, altering what is thinkable in the first place how the environment can and should be governed. Revealing these calculative means is crucial, as through these techniques the problem and accordingly the 'solution space' is defined:

> 'Calculation is central, because government requires that the 'right manner' be defined, distinct 'finalities' prioritized, and tactics finely tuned to achieve optimal results. Calculation requires, in turn, that the processes to be governed be characterized in technical terms. Only then can specific interventions be devised' (Li 2007, 6)

For instance, emerging 'Smart' Earth techniques such as remote sensing, drone technology and Artificial Intelligence allow for governing 'at a distance' (Rose and Miller 1992, 173) to take place, illustrating a shift from 'manual to automated eco-governance' (Bakker and Ritts 2018, 208). As illustration, Avron (2017) reflects on the use of drone technologies in conservation science and argues that through these drones, species are rendered visible and hence governable, altering what is thinkable how biodiversity can and should be governed. While these ecosystems are being 'perfectly legible to all who live within it from day to day' (35), these techniques serve 'to make the local situation legible to an outsider' making governing at a distance possible (Scott 1998, 45). In contrary to these remote practices, governing 'in proximity' becomes possible through more proximate techniques, such as the growing interest in biodiversity conservation towards actors who have a history of conserving ecosystems - Indigenous communities (Ulloa 2003). This aspiration to know biodiversity through Indigenous communities as 'ecological natives', is translated through these proximate techniques into the domain of reality - shaping and defining the possible solution space (Ulloa 2003, 1).

Alongside calculation, the practice of commensuration is another technique which reveals the 'making things the same' through particular devices, tools and practices (Mackenzie 2009, 443). Constructing uniformities through guidelines, criteria and other standardizing practices, realizes that 'everyday experience, practical reasoning, and empathetic identification become increasingly irrelevant bases for judgment as context is stripped away and relationships become more abstractly represented by numbers' (Espeland and Stevens 1998, 317; see also Bulkeley 2015). Perhaps even more interesting are the ideas which do not fit and therefore do not make it into this range of standards, tools and guidelines and are therefore left invisible, such as commodities which are hard to be measured or standardized (Lovell 2014). In other words, besides the simplifying 'black-box, taken-for-granted nature of commensuration', one should pay attention towards practices of incommensurability (Bulkeley 2015, 115).

Through these calculation and commensuration techniques, the problem and accordingly the solution space is defined, shaping how solutions come into being. To illustrate, Lovell (2013) shows how

governmentality allows to reveal this far from self-evident set of techniques with her research on the market-based policy initiative 'Reducing Emissions from Deforestation and Forest Degradation' (REDD+) under the UN Framework Convention on Climate Change (UNFCCC). The main aim of REDD+ is to provide financial compensation for developing countries, which can assist in preventing deforestation of their 'carbon rich' tropical forests (Lovell and Mackenzie, 2014). Interestingly, Lovell (2013) demonstrates the dominance of a 'measure and manage' discourse in forest carbon. Tropical forests are framed as 'wild, unmanageable and unquantified: untamed forests that need to be brought to order and under control through systematic measurement by nation-states' (180). Lovell (2013) points to this Measurement, Reporting and Verification (MRV) storyline which includes an optimistic belief that one can know the forest and in turn generate policy programmes through measuring, quantifying and verifying practices. These MRV techniques translate this rationale into the domain of reality – shaping and defining the possible solution space. In other words, these practices enable to see the climate as an 'administrative domain' through which techniques 'shape the realm of the possible' (Lövbrand and Stripple 2010, 21). In light of this discussion on measure and manage, Turnhout et al. (2014) refer to a 'measurementality' in biodiversity conservation, which they describe as the 'privileging scientific techniques for assessing and measuring the environment as a set of standardized units which are further expressed, reified, and sedimented in policy and discourse and which, in turn render the environment fungible' (583). Such a governing logic of making nature 'perfectly legible' involves reducing complex and 'disorderly' reality to categories which are 'easiest to monitor, count, assess, and manage' (Scott 1998, 262). In other words, biodiversity is broken down into abstract and standardized units to make biodiversity legible, commensurable and exchangeable, and hence governable (Turnhout et al. 2014, 583; Scott 1998). Taken together, these examples illustrate how 'Smart' Earth and MRV techniques translate the measure and manage and measurementality rationale into the domain of reality - shaping the possible solution space and therefore *how* climate-biodiversity governance is accomplished. While there is a longstanding awareness of these tensions emerging with NBS' forerunners, we lack an understanding *how* biodiversity is made to fit with the climate agenda – yet knowing *how* determines what is governed, for whom, why and in the end with what outcomes.

The mutually constitutive nature of rationales and techniques allows governmentality to delve into *how* governing is undertaken, how power is generated and sustained, in contrary to the more conventional demarcated assessment of functions, actors and arrangements in transnational governance. Taken together, a governmentality lens could assist in revealing these far from self-evident set of developed techniques, such as expertise, tools, and standards that render rationalities of TGI operating at the climate-biodiversity interface, governable. Examining these rationales and techniques is crucial, as framing biodiversity as solution or service for climate change could result in perverse outcomes for biodiversity (Osaka et al. 2021). This necessity directs to assessing how TGI are actually framing biodiversity in relation to climate – for which we turn to the methodology.

3. Assessing Initiatives Operating at the Climate-Biodiversity Interface

In order to generate a deeper understanding of how biodiversity is governed by actors which have a particular interest in the climate agenda, and have come to increasingly engage with both biodiversity and climate agendas through the deployment of NBS, this paper chose to focus on TGI operating at the climate-biodiversity interface. The sample of TGI employed in this study was made available from a database of Negacz et al. (2020) within the BioSTAR project. The BioSTAR project is a collaboration between PBL Netherlands Environmental Assessment Agency and the Institute for Environmental Studies (IVM). The database was collected by the integration of the databases from the BioSTAR and CONNECT projects, and focuses on five sectors within biodiversity: climate change, agriculture, energy, fisheries and forestry. This list was derived based on an analysis on keywords related to biodiversity, resulting in a database of 331 initiatives (see Negacz et al. 2020 for further information). In order to understand how initiatives operating at the climate-biodiversity interface are engaging with biodiversity, those in this database which have addressing climate change as objective in their mission statement or aims at that time were then selected. Given the significant impact that agriculture, forestry and urbanisation play in driving land-use change and biodiversity loss (IPBES 2019), the study focused on initiatives in related domains: Carbon sequestration and Forests, Carbon markets and Finance, Agriculture and Food and Regions, Cities and Local communities.

From the resulting group of twenty TGI that met these criteria (Figure 1), the majority historically focused on climate and now have come to engage with biodiversity (e.g. Rainforest Alliance has a reversed order), together shaping the emerging climate-biodiversity governance complex. Each of the twenty initiatives initially studied were allocated the same amount of time (i.e. half of a day) for the collection of secondary sources of data from websites and reports, and a data hierarchy was followed. Subsequently, six initiatives from the 'carbon sequestration and forestry domain' (Table 1) were selected for in-depth analysis. For these six in-depth case studies, additional data from three social media platforms (Twitter, Facebook and LinkedIn) over six months (January-June 2021) was collected. Three of these six in-depth case-studies (Nature4Climate, Rainforest Alliance, Cool Earth) are presented here, due to the constraints of the world limit. This research took a constructionist approach by performing a discourse analysis in order to understand how biodiversity is framed in relation to climate and governed by TGI. The data was analyzed and coded in NVIVO by one author, with cross-checks made by the other author, and together patterns in the data were identified. Codes were derived based on the literature review, such as 'smart earth techniques' and 'Indigenous communities' in combination with additional codes which were inductively derived from the data itself, such as 'biodiversity for climate resilience', 'biodiversity as threat' and 'biodiversity as co-benefit'. The framings were grouped until a point of saturation was reached and no other discursive elements were found, resulting in the climate-biodiversity framings by TGI discussed in Table 2. Yet, it should be noted that this research did not intend to represent the larger and unknown world of TGI at the climate-biodiversity interface. The resulting framings have been found at a particular place and time, and were limited to a relatively small set of cases (mainly within the Forestry and Carbon sequestration domain). Therefore, and following Foucault's call to 'keep moving' there is need to continue exploring along the unknown universe of climate-biodiversity TGI (Walters 2012, 8).

Figure 1: Sample of TGI

Table 1: Included TGI operating in the carbon sequestration and forestry domain

	Background
Nature4Climate	Nature4Climate (N4C) was launched in 2017 by a number of organizations (e.g. UN-REDD, UNEP, UNDP) in order to 'raise the profile of these [Natural Climate Solutions] solutions, and drive increased action and investment in Natural Climate Solutions' (N4C 2021f).
Rainforest Alliance	Rainforest Alliance (RA) is a non-profit organization which started in 1986 with a central vision of 'creating a more sustainable world by using social and market forces to protect nature and improve the lives of farmers and forest communities' (RA 2021c).
Cool Earth	Cool Earth (CE) was established in 2013 and is a charity which aims to 'work alongside rainforest communities to halt deforestation and its impact on climate change' (CE 2021f).
Climate and Land Use Alliance	The Climate and Land Use Alliance (CLUA) started in 2010 and aims to 'realize the potential of forests and land use to mitigate climate change, benefit people, and protect the environment' (CLUA 2021).
The Blue Carbon Initiative	The Blue Carbon Initiative (BCI) was started in 2011, and is a global program who aims to 'mitigate climate change through the restoration and sustainable use of coastal and marine ecosystems' (BCI 2021).
4Pour1000	4Pour1000 (4P1000) started in 2015 with the aim to 'demonstrate that agriculture, and in particular agricultural soils can play a crucial role where food security and climate change are concerned' (4P1000 2021).

4. Constructing Governable Biodiversity Spaces

Following a governmentality approach, in order to understand how TGI are constructing biodiversity as a means through which climate change can be governed, we need to consider both the rationalities through which this issue is problematized and made amenable to intervention and the practices through which biodiversity spaces are rendered governable 'at a distance' and 'in proximity'. Unpacking these constructed governable biodiversity spaces points to the mundane techniques through which solutions are generated in governing biodiversity as extended 'administrative domain' of climate change.

Constructing the issue of Biodiversity in Relation to Climate

Based on the analysis of the overall sample of twenty TGI, the research reveals two overarching, yet not equally prevalent rationalities, with several distinct discursive elements by TGI, which are shown in Table 2. First and foremost, TGI are seeking to govern biodiversity by expressing nature or biodiversity as a *means* to act on climate change. Here, nature needs to function at its climate best in several, distinct ways – being it to store carbon, to increase climate resilience, as cost-effective measure, as co-benefit, to tackle the interlinked crises as well as through Indigenous communities as climate regulators. Second, TGI are increasingly seeking to govern the loss of biodiversity by portraying it as asset at *risk* due to the crucial services it provides or because our life-support system is under threat. This rationale is less prevalent yet significantly emerging among TGI, in which biodiversity is constructed as an asset at risk, and therefore a range of risk reducing interventions are needed. Simultaneously, TGI move from risks to new emerging opportunities involved in intervening and managing biodiversity. Interestingly, this research reveals that TGI draw in different directions and are interchangeably using distinct elements of the rationales. This unsettledness implies that no dominant rationality could be derived per TGI, and points to incoherence in the rationales among the TGI. These two overarching rationalities are portrayed in varied ways, and come into being through several techniques such as standards, tools and 'Smart' Earth and MRV techniques which renders the issue governable. The next section demonstrates how three TGI (RA, N4C and CE) are constructing these governable biodiversity spaces through these techniques, shaping the possible solution space and therefore how climate-biodiversity governance is accomplished.

Table 2: Rationales in constructing biodiversity in relation to climate by TGI

Two main rationales	***Elements***	***Examples of TGI***
Biodiversity as a 'means' for the adaptation and mitigation of climate change	Mitigating to climate change: ecosystems as carbon storehouses	Ecosystems as 'storehouses' of 'vast amounts of carbon' (Climate and Land Use Alliance 2016, 51)
	Adapting to climate change: increasing climate resilience	'Healthy ecosystems and biodiversity tend to increase the resilience of production systems and livelihoods to shocks and stresses, including climate change…' (Plan Bleu 2020, 10)
	Nature as cost-effective carbon mitigation and adaptation solution	'Restoring our forest's ability to store carbon on a global scale is a critical and cost-effective climate mitigation solution' (We Are Still In 2021)
	Biodiversity as a co-benefit	'Nature-based Solutions take into account the long term; they are often *no-regret solutions* that give ecosystems time

		to adapt. They offer a rich range of co-benefits', such as biodiversity protection (Plan Bleu 2020, 7)
	Tackling the climate change and biodiversity crises at once	Climate change and biodiversity loss as 'two sides of the same coin' (International Development Finance Club 2020, 1; Nature4Climate 2021d)
	Indigenous communities as 'technique'	'Increasing recognition of indigenous and community forest and land rights as an effective and cost-efficient climate change solution' (Climate and Land Use Alliance 2018, 5)
	Indigenous communities as stewards	'the existence of the indigenous peoples and their cultures goes hand in hand with a healthy environment...Recognition of indigenous land titles and with it, the conservation of the rainforests, is therefore a direct contribution to the global climate action' (Climate Alliance 2017, 2)
Biodiversity loss as 'asset at risk' or threat and therefore the need to intervene and 'manage' biodiversity	Risk of losing the 'services' biodiversity provides	'Noting that biodiversity and ecosystem loss is part of the five top global risks based on impact and likelihood of occurring (as shown in the World Economic Forum's most recent Global Risks Report), and that the costs of the ecosystem services loss is estimated to range between USD 4,3 and 20,2 trillion per year according to OECD' (International Development Finance Club 2020, 1)
	Life-support system under 'threat'	'Nature is not 'nice to have' – it's our life support system' (Cool Earth 2019)
	From risks to new opportunities	'replenishing and rebuilding biodiversity is an urgent global priority and those financial institutions which show market leadership by being early movers may have a considerable competitive advantage' (Eric Usher, Head of the UNEP Finance, 2021)

Rendering Biodiversity Governable at a Distance and in Proximity

In constructing governable biodiversity spaces, several techniques have evolved which generally can be distinguished between knowing and standardizing nature at a distance, and knowing and stewarding nature in proximity. First, we will delve into the mundane techniques of knowing and standardizing nature at a distance, which will be followed by an overview of knowing and stewarding nature in proximity.

Rendering Biodiversity Governable by Knowing and Standardizing Nature at a Distance

Turning first to how TGI construct governable biodiversity spaces by a range of techniques which can be interpreted as knowing and standardizing nature at a distance. Through these techniques both biodiversity (for climate) and biodiversity 'as asset at risk' rationales are reproduced and are rendered governable. These remote practices include a range of 'Smart' Earth and MRV technologies, such as drone technology, remote sensing as well as standards, certification schemes and programs through which these remote measurement techniques are in turn standardized – constructing uniformities how biodiversity (for climate) can and should be governed.

First and foremost, N4C renders biodiversity (for climate) and biodiversity as 'asset at risk' rationales, measurable, visible and commensurable and thereby governable by focusing on 'Nature Tech' to 'scale up NBS'. N4C translates its belief that one can know biodiversity at a distance by referring to 'Nature Tech':

> 'NBS can be greatly aided by innovative technology. Many see nature and technology as polar opposites, and by extension believe that "natural" and "technological" solutions to global crises exist in conflict. We believe the opposite, and so this year we will be turning our attention to 'Nature Tech' – technology that can accelerate the deployment of NBS at scale' (N4C 2021c).

Nature is portrayed as in 'need' of technology, stating that 'Tech is a tool; it's up to us how we use it. Nature now needs tech support too' (N4C 2021c). They operationalize 'Nature Tech' as 'high-tech applications that enable, accelerate and scale-up NBS' in the following areas (N4C 2021c):

> 'technology to deploy NBS, such as drone technology for reforestation; technology to monitor, verify and report on NBS such as satellite monitoring and DNA testing; technology to improve transparency around NBS; and technology to connect people and projects involved in NBS' (N4C 2021c).

These NatureTech measurement techniques are argued to be necessary to 'accelerate' the 'large scale application of natural climate solutions' (N4C 2021c). This is supported by their Natural Climate Solutions Atlas which demonstrates how countries could use natural climate solutions, enabling 'every nation' to 'harness the power of #nature to reduce its carbon emissions' (N4C 2021g). These high-tech measurement techniques are making certain climate mitigation elements of biodiversity visible, securing that nature will perform to its climate best. Interestingly, these distanced techniques are not only rendering elements of biodiversity visible which connect it to climate mitigation, the framing of nature as asset at risk, is also reproduced through these emerging NatureTech techniques in which calculating practices 'can help derisk' nature (N4C 2021c). Through this obvious appeal to 'Smart' Earth techniques by N4C nature is rendered commensurable, measurable and visible and therefore governable. By using NatureTech and arguing that 'data and measurement are critical to unlocking our understanding of #biodiversity. Better data create better solutions for nature' (N4C 2021a), knowing nature by reducing it to abstract numbers reflecting particular worthy aspects of nature detached from any context is normalized and standardized.

Interestingly, RA (2021b) also contributes to normalizing these particular measurement techniques by referring to the Nature Tech article from N4C with the statement that these technologies have 'a vital role to play in accelerating the deployment of nature-based solutions, at a time when speed is of the essence'. They are rendering biodiversity (for climate) and biodiversity as asset at risk measurable, visible and commensurable and thereby governable by focusing on knowing and standardizing nature at a distance with their RA certification program. They argue that they take a 'novel, risk-based approach' with their updated 2020 Sustainable Agriculture standard, including biodiversity as 'fundamental principle' (RA 2020a). RA (2020b) argues that they include criteria in their standard to 'maximize the positive impact and minimize the negative impact of production on biodiversity' (1)(Table 3). Addressing biodiversity will diminish farmers' risk as they are 'better able to cope with the effects of climate change' (RA 2020a), and will ensure that a healthy soil 'can act as both a carbon pool (reservoir) and carbon sink' (RA 2021d). Interventions are considered worthy when they contain risk reducing qualities (e.g. protecting endangered species), assist farmers to adapt to climate change (e.g. planting new crops, diversifying) and mitigate climate change (e.g. improving soil health). These particular deemed worthy aspects of nature are formalized and standardized into these criteria, which are in turn rendered visible through measurement: '[RA] will harness the power of data to strengthen

assurance on these criteria—satellite imagery will help us check for deforestation, data collected by producers will enable us to evaluate native vegetation cover' (RA 2020b, 1). As a result, ways of knowing biodiversity from space (i.e. its vegetation cover) are rendered governable at the expense of other ways of knowing – including local yet illegible ways of knowing ecosystems for TGI.

Table 3: Criteria RA (RA 2020b, 1)

Criteria RA
'Maintaining and increasing the diversity of native vegetation through practices like agroforestry (a practice of nurturing existing trees and planting new ones side by side with crops) and establishing wildlife corridors')
'Taking steps to diversify the type of crops and vegetation grown on the farm and support functional biodiversity (i.e. pollinators and natural predators of pests) through an Integrated Pest Management strategy'
'Supporting the protection of endangered species and other native flora and fauna by prohibiting hunting, minimizing the spread of invasive species, and taking steps to minimize human-wildlife conflict'
'Minimizing negative impacts from farming by improving soil health through mechanisms like erosion control and increasing soil organic matter'

A standard like RA constructs uniformities about which biodiversity aspects are deemed worthy to be known, including the particular qualities that secure that nature will perform to its climate best, shaping what is thinkable about how biodiversity resources can and should be governed, and what and who are (not) included. The use of these common metrics reveals the technique of commensuration, in which biodiversity is broken down into units in a way that they are rendered commensurable, exchangeable and legible which renders the issue governable.

Rendering Biodiversity Governable by Knowing and Stewarding Nature in Proximity

Alongside knowing and standardizing nature at a distance, TGI are rendering the biodiversity (for climate) rationale governable by knowing and stewarding nature in proximity. Indigenous communities are turned into subjects on the ground which play a crucial role in conserving nature for the adaptation and mitigation of climate change. The aspiration to know and steward nature in the interest of climate change is translated through Indigenous techniques, shaping how solutions come into being, that is, through these 'ecological natives' (Ulloa 2003, 1).

First, RA illustrates the rise of Indigenous techniques as ways of knowing and stewarding nature for climate interests by arguing that 'indigenous leadership is another crucial natural climate solution' (RA 2019). RA aims to govern biodiversity through practices of agroforestry and regenerative agriculture as 'biodiversity-boosting measures', in which the latter is 'inspired by indigenous wisdom' (RA 2020a; RA 2021a). Likewise, N4C points to Indigenous peoples as technique: 'forests managed by indigenous peoples and local communities often boast deforestation rates 2-3 times lower than similar lands' (N4C 2021e). Similarly, CE employs a stewardship rationale in which Indigenous communities are turned into subjects which play a crucial role in conserving nature for the adaptation and mitigation of climate change. Indigenous people are referred to as 'effective biodiversity and conservation managers' and the 'primary custodians of most of the world's remaining tropical forests and biodiversity hotspots' (CE 2021b). Likewise, they argue that 'indigenous peoples and local communities manage at least 24 percent (54,546 MtC) of the total carbon stored above ground in the world's tropical forests, a sum greater than 250 times the amount of carbon dioxide emitted by global air travel in 2015' (CE 2021b). Furthermore, they argue that 'cash' will have 'double the impact when put in the hand of rainforest communities' (CE 2021d). Through romanticizing Indigenous communities as knowing, stewarding and rewarding subjects in mitigating climate change, they are rendering the aspects of biodiversity visible

which matter for climate change. Moreover, they argue that people 'like Jaime in the Peruvian Amazon' are 'essential in helping Cool Earth understand the intricacies, challenges and opportunities of forest protection' (CE 2021c). By portraying Indigenous groups as these 'true climate experts' (CE 2021e), they are enabling the asset to be managed in the face of climate change, securing that nature will perform to its climate best, even under changing conditions. This reinforces the rationale that biodiversity serves climate interest (over the long term).

Perhaps more importantly, knowing and stewarding nature in proximity is combined with knowing and standardizing at a distance by CE. CE seeks to govern nature for climate interests by combining MRV technology with Indigenous traditions. For instance, they argue that they combine 'the latest technology with Indigenous Asháninka traditions' in order to protect the forest (CE 2021c). By applying satellites technology they are rendering the issue of biodiversity (for climate) visible: 'biodiversity can also be mapped to a high-level using satellite data. Using technology that shows biodiversity in colour, the spectacularly varied image of Cool Earth's Asháninka partnership looks markedly different to the muted tones of a monoculture palm plantation' (CE 2018). They operationalize their biodiversity (for climate) rationale through Indigenous communities and in turn secure these techniques into guidelines, which - among others - stresses the need to monitor, review and report (Table 4):

Table 4: MRV techniques (CE 2021a)

Principles	
Monitor	'Cool Earth is developing robust and consistent monitoring and evaluating frameworks across all of our partnerships to make sure we can adapt to new issues that arise from time to time, and to take steps with our partners to come up with new approaches'
Review	'Using a combination of outcome monitoring, satellite analysis, and reviews of programme delivery costs, we can evaluate the long-term effectiveness of each partnership and the most successful approaches to achieve positive impacts for rainforest protection'
Report	'To progress and remain accountable to our donors and, most importantly, our beneficiaries, Cool Earth regularly reports on partnership challenges and successes'

In other words, they combine Indigenous communities as technique with the technique of monitoring to evaluate the effectiveness of partnerships by CE, securing that nature will perform to its climate best in plural ways. Whereas on the one hand CE refers to the distribution of tasks and actions by deliberative community-led approaches, on the other hand CE points to an expert driven, control and management approach in which MRV techniques are in place to evaluate its effectiveness. The aspiration to know nature through these romanticised stewards together with shepherding nature at a distance through a range of MRV techniques is in turn fixed and standardized through these guidelines.

5. Discussion and Conclusions: Unsettled Shepherds and Romanticized Stewards at the Climate-Biodiversity Frontier

This paper argues that rather than considering TGI in terms of their actors and functions, we need to develop a new approach which is capable of analyzing *how* governing takes place, because in the end this also determines what is governed, for whom and why – how it is useful, but not only on its own, because knowing how tells us what is happening and shapes outcomes. By focusing on a plurality of rationales and families of techniques, governmentality provides a means to capture the multiplicity and plurality of how governing takes place. Using this approach to examine the ways in which TGI are constructing biodiversity as a means through which climate change can be governed, this paper finds that this involves three main implications.

First, this research has shown how insights from governmentality can advance understandings of these emerging governance spaces, allowing to see how biodiversity is made to fit within the complex world of climate change by TGI and at the same time how this is still unsettled. It reveals why TGI are strategically linking and expanding their regime mission through the deployment of NBS - as this will further their own (climate) agenda, 'regardless of whether such linkages distract from the common good' – which raises scrutiny regarding its problem-solving capacity (Jinnah 2011, 4). Engaging with NBS soon requires 'them to shift from instrumental to substantive engagement', which could explain the emerging risk rationale in seeking to embed non-utilitarian demands of the concept, providing a new take on longstanding REDD+ discussions (Wapner 2011, 142). Simultaneously, taking this approach reveals evidence for the raised concerns of climate-biodiversity 'bandwagoning' spelled out by a number of scholars (e.g. Osaka et al. 2021; Jinnah 2011), arguing that rather than being a 'natural' fit, the use of NBS has the potential to become problematic when these are focused on the deemed worthy services and solutions of biodiversity which matter for climate change. Taken together, this points to thinking about the climate-biodiversity complex as a '*frontier*' which keeps switching, involving conflict and contestation over values and interests, and therefore constantly evolving.

Second, on this climate-biodiversity frontier the overarching emphasis on knowing nature through a range of 'Smart' Earth and MRV technologies (e.g. Nature Tech) highlights its crucial role in shepherding biodiversity under climate change (in still unsettled ways) (Lovell 2013). Through these distanced techniques, interventions targeting biodiversity as a means through which climate change can be governed are normalized, reproduced and secured – and with constituents accepting standards, criteria or guidelines as new rules these constructed (inconsistent) biodiversity spaces shape how solutions come into being (Bulkeley 2012). These technologies express the need for reliable, standardized and abstract information of complex ecosystems to make it legible and hence governable (Scott 1998; Turnhout et al. 2014). However, knowing biodiversity through these measurement techniques is not without consequences, as 'measuring can never be a completely neutral activity. It involves the exercise of power in the sense that rendering an object of interest measurable or legible involves critical choices about what to measure and how' (Turnhout et al. 2014, 583). In fact, these abstract ways of knowing biodiversity can never represent complex reality while being at the expense of more illegible local ways of knowing (Scott 1998). Measurable and abstract expertise risks to become dominant at the expense of less measurable knowledge, such as genetic diversity, pointing towards practices of incommensurability (Mathews 2016). While it is important to understand how and at which rate biodiversity is lost, one should caution an approach in which '*only what can be counted counts*' (Turnhout et al. 2014, 594). Perhaps more importantly, the danger with these techniques of shepherding is when they are focused on the particular parts of biodiversity that matter

for climate change, narrowing their focus to legible climate outcomes and making these aspects of nature becoming more known than others (Scott 1998). All in all, while these technologies enable to make informed decisions in terms of restoration efforts, there are significant 'risks of knowing from a distance' involved (Pritchard et al. 2021).

Third, romanticizing knowing and stewarding nature in proximity through Indigenous experts as 'knowledgeable subjects' (Bryant 2002, 284) enables nature to be managed in the face of climate change, while raising questions whether this in fact is that romantic on the ground. Paradoxically, 'the very moment that such empowerment is attained is also the occasion when a significant loss of 'freedom' from surveillance and control seems to happen. Empowerment is thus apparently bought at a price' (Bryant 2002, 286-287). Especially the combination of Indigenous forms of biodiversity conservation with 'Smart' Earth technologies is illustrating this paradox, potentially generating new spaces of control, which may have severe justice implications (Corbera 2012). These techniques often support 'security objectives rather than equitable access', raising concerns whether Indigenous peoples have agency and in the end who benefits from these kinds of distanced techniques (Bakker and Ritts 2018, 208; Schroeder 2010). For instance, data which is generated by Cool Earth could reinforce asymmetrical power relations, resulting in inequitable restoration interventions, risking that 'imported faith and abstraction prevailed… over close attention to the local context' (Scott 1998, 273). Especially in contested places, involving marginalized or displaced communities, this concern is reinforced, which in turn highlights the need to assess how generated data is used, by whom, and accordingly its impacts (Pritchard et al. 2021). This raises questions who actually benefits from these kinds of interventions, and aligns with the growing concerns regarding nature conservation for the sake of other interests – issues which are largely left undefined and therefore made invisible by the initiatives.

Perhaps most importantly in finding these unsettled shepherds and romanticized stewards, is that one should not miss one of the key lessons of Foucault: 'to keep moving' alongside this climate-biodiversity frontier (Walters 2012, 8). This 'keep moving' argument implicates that the set of discussed rationalities and techniques are anything but set in this study, rather, it is a loose set of analytical tools which indicates an emerging climate-biodiversity TGI space, informing the study of climate-biodiversity governance, rather than prescribing it (Rose et al. 2006). 'Keep moving' is crucial as how these two fields are governed in conjunction will be an *ungoing* and unpredictable pathway, constantly unfolding, being contested and realigned and therefore expanding research in this emerging climate-biodiversity governance complex is essential (Bulkeley 2015; Scott 1998). Future research could focus on how these unsettled spaces develop over time by examining a broader sample of TGI or other governing actors which are operating at the climate-biodiversity frontier, such as financing actors or cities. Especially in light of the 15th and 27th Conference of the Parties (COP15 & COP27), its combined climate-biodiversity pledges and its accompanied focus on 'Smart' Earth techniques this need for further research and call to keep moving should be stressed. Once more, governmentality points to the dangers involved in constructing these governable biodiversity spaces, and whereas Plan Bleu refers to NBS as a 'no-regret' solution, this study argues that constructing biodiversity as a means through which climate change can be governed could generate rather regrettable solutions. It aligns with Foucault (1984) who argues that:

> 'my point is not that everything is bad, but that everything is dangerous, which is not exactly the same as bad. If everything is dangerous, then we always have something to do. So my position leads not to apathy but to a hyper- and pessimistic activism' (343).

Biography

Anouk Fransen is a PhD Researcher at the Copernicus Institute of Sustainable Development, Utrecht University interested in the governance of nature and unfolding politics at the climate-biodiversity interface. Her PhD research examines how, why and for whom actors and forms of expertise are framing, deploying and evaluating NBS at the climate-biodiversity interface, shaping what comes to be 'counted' as solutions to the twin challenges of climate and biodiversity and therefore how governance along these shifting and unfolding climate-biodiversity frontiers is accomplished.

Harriet Bulkeley FAcSS FBA is Professor in the Department of Geography, Durham University, and at the Copernicus Institute of Sustainable Development, Utrecht University. Her research focuses on environmental governance and the politics of climate change, energy, nature and sustainable cities. She has published 8 books, several edited collections and over 70 papers, including *An Urban Politics of Climate Change* (Routledge 2015) and *Accomplishing Climate Governance* (CUP 2016). She has undertaken commissioned research for the UK Government, European Commission, NGOs, UN-Habitat, the OECD and the World Bank and in 2023 was appointed to the Scientific Council of the European Research Council.

Acknowledgements

We would like to thank the two anonymous reviewers for their helpful and constructive comments on the earlier versions of this manuscript. We would also like to thank Michele Betsill, Stacy van de Veer, co-organizers of the ''Transnational Governance Initiatives at the Climate-Biodiversity Frontier'' workshop held in June 2022 in Gothenburg, and fellow participants for their feedback on the earlier versions of the manuscript. Lastly, we would like to thank PBL Netherlands Environmental Assessment Agency and the Institute for Environmental Studies (IVM), for kindly sharing the database which made this work possible in the first place.

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