Perspective

Evolutionary Perspectives on Environmental Governance: Strategy and the Co-Construction of Governance, Community, and Environment

Raoul Beunen [1,*], Kristof Van Assche [2] and Monica Gruezmacher [3]

1   Faculty of Science, Open Universiteit, 6401 DL Heerlen, The Netherlands
2   Department of Earth and Atmospheric Sciences, University of Alberta, Edmonton, AB T6G 2E3, Canada
3   School of Science and the Environment, Grenfell Campus Memorial University,
     Corner Brook, NL A2H 5G4, Canada
*   Correspondence: raoul.beunen@ou.nl

Abstract: The attention to sustainability transformations and related processes of learning, innovation, and adaptation has inspired a growing interest in theories that help to grasp the processes of change in governance. This perspective paper and the Special Issue of which it is part explore how evolutionary perspectives on environmental governance can enrich our understanding of the possibilities and limits of environmental policy and planning. The aim of this paper is to highlight some key notions for an evolutionary understanding of governance theory and to show how such an evolutionary perspective can help to develop a more integrated perspective on environmental governance in which the temporal dimension and the effects of steering attempts play a pivotal role. It is argued that the effects of environmental governance on the material environment, community, and governance itself must be considered in their interrelation. Such insight in couplings and co-evolutions can be of great value in the everyday practice of environmental policy and governance and even more so when attempting to transform the governance system towards more ambitious and coordinated goals.

Keywords: governance; sustainability; innovation; adaptation; power; discourse

1. Introduction

This perspective paper is part of a Special Issue that explores evolutionary approaches to environmental policy and governance. It showcases relevant developments in evolutionary understandings of governance, particularly in the context of calls for fundamental social–environmental changes that abound in the literature on sustainability and the environment [1–4]. The various sustainability challenges that communities all over the world are facing require changes in values and narratives, behaviour, and private and public organizations and related sets of institutions. These challenges and the urgent need for change are reflected in the Sustainable Development Goals [5], international agreements, and various policies at all levels. Governance is a means of achieving and sustaining change, but it can also be an obstacle to change in society and in governance itself. Indeed, many authors agree with the need to change governance systems in order to facilitate pathways to a more sustainable future [6,7]. A wide range of theoretical approaches to change in and through governance exists, focusing on social learning [1,2], innovation [3], policy change [4,5], transitions [6–8], and, more recently, transformative change [9]. These bodies of literature show that working towards more sustainable forms of governance is difficult, and outcomes often deviate from ambitions and policy goals.

The focus on governance brings attention to processes of steering, planning, and other deliberate attempts to coordinate and work towards common goals and visions. These goals and visions can be clear and focused on a specific situation or very ambiguous with a long time horizon. Governance comes with a focus on deliberative change, and

changing governance itself has become an important goal as well [6,8,9]. At the same time, it is recognized that changes in governance are only partly driven by these deliberative attempts, while many attempts trigger effects beyond what was intended. Environmental governance is thus best understood as an emerging outcome of many actions, intended and unintended, influenced by numerous factors and processes that are beyond the control of any individual actor [10,11].

The emphasis on sustainability transformations and the related processes of learning, innovation, and adaptation has inspired a growing interest in theories that help to grasp the processes of change in governance [12–15]. Yet, various authors argue that the literature on change in environmental governance and, more specifically, on sustainability transitions is rather fragmented, and hence that there is a dire need for the further integration of different insights and knowledge [16–18]. At the same time, one should recognize that knowledge integration concerning governance and sustainability transitions will always be partial because of different ontological and epistemological assumptions, diverging points of departure and focus, and because the literature puts forward a myriad of descriptive and normative perspectives that simply cannot be brought together in a unified theory that captures all aspects of governance. A fruitful way forward lies in the development and enrichment of theoretical frameworks that allow for a more flexible combination and integration of different insights that can be adopted depending on research questions and context [19].

The aim of this paper is to showcase the use of an evolutionary perspective on environmental governance and policy. Drawing on various theoretical insights about change and evolution in governance, it explores how such an evolutionary perspective on governance can enrich the literature on environmental policy and governance and be useful in delineating and understanding the opportunities and limitations for strategy, steering, and planning in the context of environmental governance and sustainability transformations. Section 2 will first deepen the argument for an evolutionary governance perspective and identify key notions of such an evolutionary understanding of environmental governance. We then illustrate how these can be brought together in the analysis of evolving environmental governance and sustainability transformations. Section 3 focuses on the co-evolution between the configuration of actors/institutions and power/knowledge, while Section 4 reflects on the emerging governance paths and the various dependencies that impact the evolution of these governance paths. Section 5 pays particular attention to the role of the material environment in governance. Finally, things are brought together in Section 6, which reflects on complex and simple forms of environmental governance, to end with some concluding remarks in Section 7.

2. Key Features of an Evolutionary Understanding

There are many theories of governance and society, but the temporal dimension, paying attention to changes over a longer period of time, is not often explicitly addressed [12,19,20]. Various authors have therefore argued for more attention to the processes of change, often with a focus on institutions and institutional change [13,14,21], as well as the factors that explain stability and lock-ins [22]. An evolutionary understanding complements such perspectives by bringing attention to the ways in which different elements of governance change in relation to each other. The growing body of literature on environmental governance shows that evolution can be conceptualized and understood in different ways [23–26]. While some approaches draw on theories of biological evolution, others have developed their own concepts to analyze the way in which social systems change in their interplay. Most evolutionary approaches to governance and society include the notion that elements and structures are shaping each other in ongoing interactions and recognize that whatever exists in the social world is a product of previous processes as well as the input for further ones [27]. The evolutionary approaches differ in the elements they focus on, what is seen as the overall social structure, and the way in which interrelations between structures and elements are understood. Different theories focus on either people,

actions, or communications as elements and institutions, discourses, or social systems as the main structures.

We argue that a perspective of co-evolution in governance must take into account three important insights from the literature and that it has to provide a credible account of the relations between discourse, organizing (institutions), and materiality in taking these insights on board. As such basic insights, we consider (1) governance is always evolving, (2) change is contingent, and (3) discursive dynamics are the main drivers of change in governance.

2.1. Governance Is Always Evolving

Many theories on governance, policy, and public administration in some way pay attention to change [19]. Most attention is given to the impact created by governance systems or particular interventions such as policies, policy instruments, strategies, or management schemes. Other approaches focus on the processes by which these interventions are designed or the processes by which existing institutions are revised. Such a focus on changing policies or other institutions often comes with implicit or explicit assumptions about the stability of other elements in the governance system. Many approaches to policy implementation assume, for example, that policies remain the same while outcomes develop over time. Approaches to institutional change mostly assume stable actors. While such assumed stability is useful for analytical reasons, it does not always reflect the dynamics that characterize governance systems [12]. Communities change, new issues gain attention, policies acquire new meaning, the political constellations changes, and so do individual actors. The interests, focus, views, and identity of actors are all subject to change, and so are the interrelation with other actors and the position in the network of actors present in a certain governance context.

An evolutionary understanding of governance brings attention to the fact that all elements of governance are constantly changing and that they are changing in their ongoing interplay [28]. Some changes unfold rapidly, while others only become visible over longer periods of time.

2.2. Change Is Contingent

A key insight that is reflected in most evolutionary approaches is that change in governance systems is a phenomenon that emerges out of the interplay between many different purposive and non-purposive actions and unexpected events [29]. A fair amount of studies illustrate how intentions (in the form of plans, policies, or the like) rarely play out in the way that was expected but have certain effects [30,31]. Visions for the future, plans, designs, strategies, and many other different purposive actions all play their part but by themselves offer only a partial explanation for the observed changes in governance and society [32]. Furthermore, the different processes of change are connected in time. Every outcome, either in the form of specific elements of governance or in the overall structure, recurrently shapes what happens in the future [33]. Within governance, elements, structures, objects, and subjects are thus to be considered products of transformation, as well as starting points for further transformation [34]. Over time, the recursive repetition of events leads to new structures, a phenomenon grasped with concepts such as emergence and contingency [27,35]. Pottage, for example, argues for more attention to the concept of emergence, explaining that "In place of ontological substances and structures, 'emergence' deals instead with structures, processes and theories that produce themselves out of their own contingency" [27]. This idea of contingency relates to the ways in which societies deal with chance and risk in order to gain control over the course of events [34,36]. Such perspective is gaining ground in complexity theories and it is used to gain novel insights into the workings, effects, and limitations of steering attempts in disciplines such as economics, law, and public administration [37–41].

2.3. Key Drivers of Change Are Discursive Processes

Governance is a social phenomenon that hinges on communications and decisions that emerge out of human understandings of the environment. Such understanding of the environment is discursively constructed [34,42,43]. Whatever the focus of governance analysis, discourses, as the visible expressions of power/knowledge configurations, always play a pivotal role in governance and hence in the understanding of change in governance [44]. The body of literature that explicitly analyses the importance of discourses is relatively small [18,45]. Additionally, the linkages with other approaches that, for example, focus on institutions or actors, are rather weak. Influential institutional theorists such as Douglas North [13] and Elinor Ostrom [15] were very well aware of the importance of discourses and the influence of these discourses on collective decision making. They referred to these discourses as belief systems but went into further detail about the processes through which these belief systems come about and change over time. With the exemption of the literature on discursive institutionalism [46,47], the literature on discourses and the literature on institutional change is therefore largely disconnected. The discursive construction of actors and subjects of governance receives even less attention, although the social construction of identities is widely acknowledged in related disciplines such as cultural geography and anthropology (e.g., [48]; Spate, 1959). Whether one talks about natural resources, social–ecological systems, citizens, or specific institutions, all elements gain meaning through processes of observation and interpretation. This social construction of the social and material environments tends to become black-boxed in governance. Michel Foucault would speak of processes of naturalization and essentialization, by which the constructed nature of these understandings disappears out of sight [49,50]. Social systems theory, as developed by Niklas Luhmann (e.g., [51,52]), draws on a different vocabulary but can also be seen as a theoretical approach that couples ways of interpreting systems of organization and rules. Neither Foucault nor Luhmann, although both radical constructivists, would argue that nothing exists outside the text. They would argue that almost everything people understand is discursively structured, and it is this discursively structured understanding that drives the organization of societies and the evolution of governance (Figure 1).
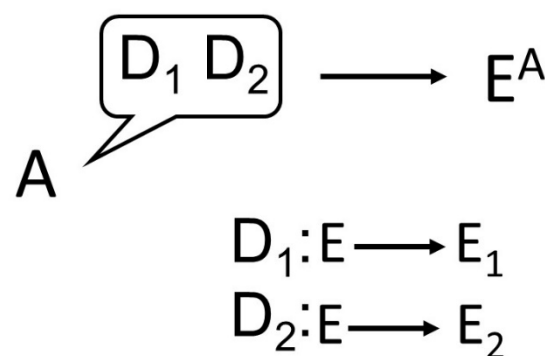

Figure 1. Interpretation of the environment E by actor A drawing on several discourses D. Each discourse has a particular interpretation of the environment E. In governance, many actors interact, each drawing on different discourses and each blending them in a unique manner. Competition and cooperation thus function on the base of more than distinctions between discourses; they also involve the unique blending of discourse and production of new discourse in the process.

3. Analysing Evolution in Environmental Governance

This section presents a framework for analysing evolution in governance. It builds on earlier work on Evolutionary Governance Theory (EGT) and integrated insights from other bodies of knowledge. The framework focuses on two connected configurations: a configuration of actors and institutions and a configuration of power and knowledge [28,53].

3.1. Actors and Institutions

The concepts of actors and institutions are familiar to many people working on governance. Actors are the players in governance, while institutions refer to the norms and rules by which actors coordinate their actions. One can distinguish between simple rules and complex institutions, such as policies, plans, and laws [54]. Although there is a growing body of literature that focuses on the relationship between structure and agency, actors and institutions are often considered to be separate and independent entities. Actors are usually seen as stable, easily recognizable entities that are assigned specific roles. If there is interest in the dynamics between actors and institutions, it is mostly in the effect of one on the other (the actor on the institution and vice versa) and much less on their continuous co-constitution. They co-evolve, and therewith, the configuration of actors/institutions evolves (Figure 2).
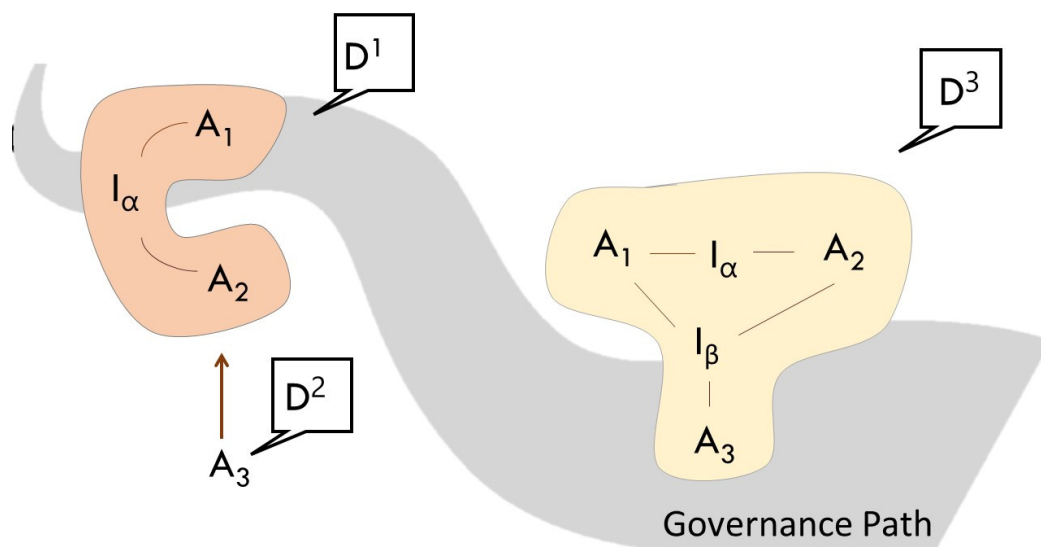

Figure 2. Actors A coordinate actions through institutions I in a process of continuous change or evolution. Changes in the Actor–Institution configurations can occur when a new actor A_3 joins the configuration, for example, bringing in a new narrative or discourse D. A new Actor–Institution configuration emerges in the governance path with the new actor A_3, new institution I_β, and new discourse D^3.

In the varied landscape of institutionalism, institutional economics in the tradition of North [13], Greiff [55], Acemoglu [56], and others offer, in our view, the most promising insights for an evolutionary understanding of governance. In the same family of perspectives, the historical institutionalism of Thelen and others [57,58], more boundary-spanning than the institutional economists, offers similar premises and conclusions [59]. For institutional economists, a notion of co-evolution is inherent in the understanding of economic transactions. Many of them, as well as some of the historical institutionalists, have moved to politics and have expanded the notion of interaction and transaction beyond the economic sphere. Actors evolve together with institutions, just as insurance policies emerge together with insurance agents, credit systems together with bankers, and laws together with lawyers [58,60]. More transactions and interactions become possible through such co-evolution, and the evolution of new rules and roles widens the scope of interactions [61].

The notion of informal institutions, already present in political science and anthropology before [13,62], slowly acquired new meanings for the economists and became a tool to embed formal rules governing a particular transaction in other systems and in cultures. What made possible the emergence of a role and a rule, of an actor and an institution, and sustaining interactions and rule compliance is the embedding of both actors and institutions

in a web of other institutions, actors, and unwritten rules that are based on shared values and identities [63,64].

Individuals, groups, and organizations can all become actors in governance [65,66]. These actors interact with each other and produce institutions, while those institutions enable further coordination and interaction and the production of new institutions. The development of institutions can include or create new actors in the continuously evolving process of governance [67]. Institutions are needed for internal coordination within the sphere of governance, and they are needed for coordination in society at large [58]. At some point, stable sites of collective decision making crystallize. These stable points can be referred to as arenas. Governance arenas are places designated for the taking of collectively binding decisions, constrained by accompanying institutions (e.g., procedural rules).

Decision making in governance can take place anywhere, but communities have empirically devised places and occasions that are more stable, often ritualized and designated for the making of collectively binding decisions. These governance arenas can be organizations [68,69], such as municipalities, ministries, or states, and these organizations can play the role of actors themselves. For example, depending on the situation, a municipality is both an actor and an arena [70]. What appears as an actor might, from another perspective, be an arena [71]. In dealing with external actors, a municipality, for example, will appear as an actor, while internally, it will be an arena where competing interests and voices can find a place.

Groups, individuals, and organizations also exist outside governance, but they become actors through participation in governance, i.e., through subjecting to coordination by means of institutions and, in return, affecting influence on the community at large—as the decisions are publicly binding [28]. Participation in governance by a new actor will obviously transform governance but (maybe less obviously) will likely also transform an individual, group, or organization that becomes an actor [72,73]. Such transformation can be needed to gain access (conditions are placed) or through participation (by copying discourse, creating discourse, and emphasizing distinctions).

3.2. Power and Knowledge

The configuration of power/knowledge concerns the discursive construction of everything in governance and brings attention to the relationship between observing and understanding the world on the one hand and organizing that world on the other. The conceptualization of this configuration strongly draws on post-structuralism, with the works of Michael Foucault and Niklas Luhmann as important sources of inspiration. Governance is an arena in which different views of the world collide, often very visible if one looks at the heated debates about all kinds of environmental issues, but also in more subtle forms through processes by which different forms of knowledge compete for prominence; social and spatial identities are constructed; narratives about past, present, and future are shared; or multiple interpretations of formal and informal institutions are discussed and negotiated.

Particularly interesting from such a perspective are the many different ways social–ecological systems are observed, understood, and translated into ways of organizing. Certain ways of observing and understanding the environment might lead to specific ways of managing or governing it [74,75]. Forms of knowledge are reflected in institutional forms, organizational structures, and management practices, as well as in the way policies and practices are monitored and evaluated [76,77]. Knowledge shapes the role and position of actors and stakeholders [78,79]. Perspectives on the social and material environment, the objects and subjects of governance, and governance as such are all constituted in power/knowledge relations [44,80].

The objects and subjects in governance are constituted in power/knowledge configurations as a result of different techniques that are available to the actors involved [81,82]). The main difference between the emergence of subjects and objects is an ontological one: subjects can produce and reproduce discourse and define themselves, while objects cannot. Subjects have the ability to internalize and embody different subjectivities [50,83,84].

The acknowledgement of objects and subjects as something different from their environment is named reification. This reification can be temporary or more durable. Objects and subjects could emerge and linger on in governance or dissolve after a while. The moment objects and subjects become part of a network and become deeply embedded in institutions, we speak of solidification (cf. [85,86]). Solidification can be enforced by the third technique of object formation: codification. This is the process in which the boundaries of objects and subjects are simplified and clarified, by which it becomes clear what constitutes the objects and subjects and what does not.

Once an object or subject has been constituted as "real" in governance, its "existence" in governance can further be strengthened by processes that stabilize the object or subject. An important process to increase the likelihood of object and subject survival is objectification: the construction of it as an objective fact, as something existing out there, existing independent of observation. In our society, this often takes place at sites such as bureaucratic, legal, and scientific organizations. A related process contributing to these processes of stabilization is naturalization, which is the process in which objects and subjects become to be considered as the natural order of things by veiling or forgetting that they were once constructed [87]. Naturalization is the contingent process, which masks the process form by which objects and subjects emerge. The further stabilization of the objects and subjects could be the result of institutionalization, the process by which the objects and subjects become codified in formal and informal institutions, organizations, laws, policies, and plans, for example.

3.3. Co-Evolution of Configurations

Actor/institution and power/knowledge configurations co- evolve in many nontrivial ways. Actors and institutions are discursive constructs whose meaning and role are constructed in power/knowledge configurations. Conversely, power/knowledge is influenced by the actions and interactions of actors, while institutions can embed and codify specific configurations of power/knowledge.

Changes in governance often include inserting new knowledge; new actors; and new plans, policies, or laws. These changes take place in a context characterized by existing institutions and in the presence of actors with their own perspectives, interests, and knowledge. These already-existing institutional contexts, with their coupled set of actors, influence initial assumptions, problem definitions, preferences for analytic tools or coordination tools (institutions), negotiation problems and solutions, and the intricate pathways of interpretation and implementation [32,88]. The coupling of several co-evolving configurations is what sparks the causes and effects that reverberate far from an original agency or intention. The shifting relations between formal and informal institutions undermine the implementation of a plan, leading to power shifts in administration; the inclusion of new actors; and the production of a new plan with high hopes for implementation because of presumed superior quality, a presumption underpinned by a new narrative recently spread through the governance.

4. Pathways to Sustainability and the Dependencies in Governance Paths

Drawing on the evolutionary perspective introduced above, some foci for analysing strategies for and pathways to sustainability emerge. Governance paths unfold over time, and possibilities to steer these paths towards the desired future become slowly visible [89]. In hindsight, these paths can be reconstructed, and such reconstruction can be used to identify factors and processes that played a role in the creation of that particular path. Through reflection on path creation and comparison with other cases, actors can develop ideas about planning and steering, in other words, about the possibility of creating future paths [90]. Those ideas can be put into action. Yet, the effects of these actions might be much more difficult to predict than is often recognized, not the least because strategies, actions, and decisions all are likely to trigger responses from other actors and set in motion a range of other actions and reactions that are beyond the control of any individual actor.

Working towards transformative change can build on such understandings. Not every goal, new policy, or other form of change is conceivable and achievable from each position in a particular governance path. Reasons include the various rigidities created in the evolution of governance. These rigidities result from the dependencies that develop between various governance elements, whereby different sets of overlapping dependencies can be distinguished.

The first set is path dependencies, broadly defined as legacies from past decisions that constrain the options for the future [91–93]. The concept of path-dependency is widely used in different theories and can refer to formal and informal institutions, routines, the presence of particular organizations, or the position of dominant actors and perspectives that all make certain decisions more likely than others [94]. Path dependencies can be cognitive as well as institutional, and they can be introduced by any element of governance that exerts power or is enrolled in power/knowledge interactions. It is important to stress that path dependencies neither predict the future nor make other options impossible [95].

Zooming in on the relations between various elements and the structures in which they are embedded, one can secondly distinguish various interdependencies that influence the options for change. Actors depend on other actors; institutions depend on other institutions; actors and institutions depend on each other; and discourses are interwoven with actors and stabilized in certain institutions, such as law and policies. A good example is certain forms of expertise that are institutionalized and specific actors that are then connected to that expertise that are likely to play an important role in governance processes and hence influence any attempt for change [77,96]. Interdependencies might limit the options for change but also influence how changes in one element will trigger a series of changes in other elements [29,97].

Material dependencies are the third set. This concept refers to the effects of material features and environments on the functioning of governance in the present and, from there, the possibilities to choose a different track [44,79,98,99]. Material dependencies can be human-made (infrastructures), natural (bedrock, climate, soil fertility), or hybrid (a polluted environment, a deeply entrenched forest management tradition) [100].

The fourth set, goal dependencies, refers to the influence of vision and goals for the future on decision making in the present (Figure 3). These goal dependencies can result from clearly defined objectives that are weighted in decision-making processes but also from more general goals such as the Sustainable Development Goals or from ambiguous visions of what the future will be or should be [101]. Various studies have already brought attention to the performative effects of such goal dependencies. They function in narratives that not only describe but also create realities because they give direction to communications and decision making and because they make people visualize their context in a certain way and hence start to act in order to reach that image of the future (e.g., [102]; also already [37]). Such an evolutionary perspective on goals and visions, but also more generally on strategy, planning, and steering, helps to explain that steering attempts sort effect, but by means much more varied than usually recognized.

In their interplay, the different dependencies create rigidities in governance and limits for change (Figure 4). At the same time, they also shape opportunities, as not everything is fixed and determined, and because new goal dependencies are formed all the time. Identifying these different dependencies and analyzing their impact on governance enriches knowledge about governance and its evolution and is key to finding and assessing options for change, designing policies and plans, and devising strategies.
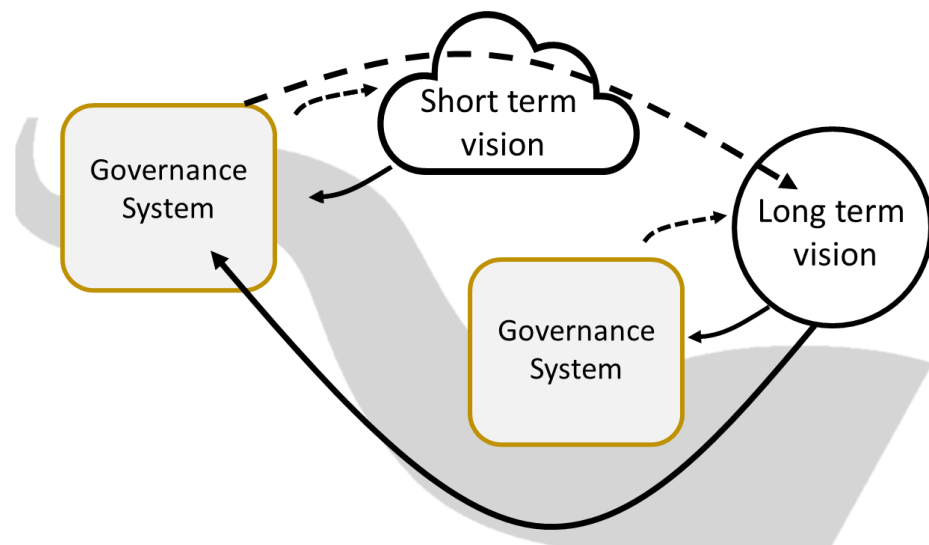
Figure 3. Governance draws on both short-term as well as long-term visions (dashed lines) that shape goal dependencies in the governance path through their impact on decision making (solid lines).
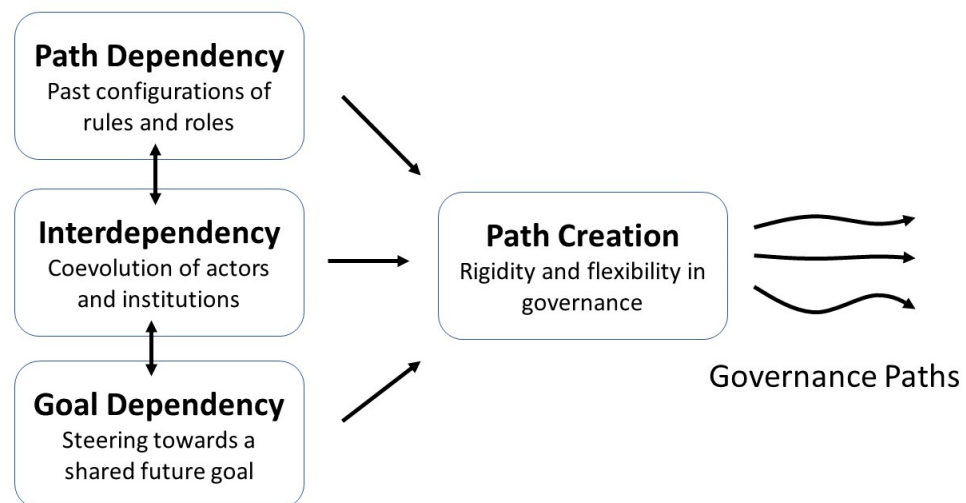

Figure 4. Dependencies and creation of governance paths according to evolutionary governance theory. Dependencies are not only obstacles. They also embody opportunities and assets. The process of path creation is both enabled and constrained by the dependencies. It is marked by contingency.

5. Is the Environment Not a Material Thing?

A common critique of all constructivist approaches to policy is that supposedly, it would downplay the importance of the environment itself, as discursive constructions are not what is tangible for people and what is supposed to be touched by environmental governance. We would tackle that argument by saying that, on the contrary, a lack of interest in the discursive construction of environments, and its problems and qualities, would mask both the actual functioning of governance and the functioning of communities living in an environment. Something is a problem or a quality when it is narrated as such and, at a more basic level, when it is observed [34,97]. In Section 3, we introduced a Foucauldian-inspired model of object formation and stabilization in evolving governance, both discursively understood and entailing an evolving set of relations between governance and its material environment [103]. In this section, we present a broader argument on the discursive construction of governance, the community it is binding, its material environment, and the couplings and feedback loops at play. This represents a development of the already-introduced EGT perspective, enabling us to refine the embeddings of governance in social–

ecological systems, and thus to refine the understanding of the effects and antecedents of environmental governance (we build on this in [54,104]).

Observations of the physical environment take place all the time in a community [34,51]. Some of these observations frame or are framed by narratives that trickle down to governance configurations, and in some cases, they will be politicized [105,106]. The actors in the governance system can also commission focused observation themselves (studies, monitoring projects, etc.), and these will likely be over-determined by the preoccupations and the logic of the governance system itself, by distinct concepts, narratives, and values [82]. Here, too, a narrative can lead to observation and vice versa, yet the character of governance processes, where competing discourses need to produce collectively binding decisions, makes for observations that are expected to play a role in that process, and "facts" that need to fit the institutionalized processes of decision-making [96]. Environmental studies, fact-finding missions, mapping exercises, evaluations, and impact assessments do not exist in a vacuum, and they do not come solely out of shared concerns in the community [107–109]. They come out of pre-structured administrative processes that reflect political compromises, and they will be argued for, carried out, interpreted, and rhetorically used in ways that fit the understanding and strategizing of the actors in governance and that fit the logic of reproduction of the governance system itself (the way political and administrative processes are structured and entwined).

This entwining of observing and organizing is a core assumption of all governance literature [110]. Each governance configuration and each path produces a unique combination of politics and administration, which links in unique ways to non-governmental actors. Administrative actors tend to have an influence on decision making and are thus political, while political actors have administrative knowledge and impact and take care of some of this themselves. Supposedly "implementing" organizations have an influence on the articulation of policy, while groups and organizations targeted by environmental policy can influence the agenda behind the scenes, thus functioning as actors [111]. As some communities are more tightly coupled to their material environment (think dependence on a resource, an agricultural landscape, or water quality for fishing), some governance configurations will become more and more politically charged environmental observations, while more people and organizations are likely to become actors, formally or informally [112].

This situation does not detract from the importance of discourse and narrative, as in a relationship of strong dependence on an environment, that dependence is also inspiring discursive constructions and then framing observation. The dependence itself is likely upheld by other narratives, e.g., identity narratives focusing on one economic activity; one place; on certain definitions of the quality of the product, environment, method of extraction, etc. [44,75,113].

The governance system is never entirely transparent for the actors. The structure of values, narratives, concepts that underpin its functioning, and the ideas built into institutions are never entirely understood. In addition to the blind spots that come with any observation and construction of an environment, this adds a layer of selectivity and opacity. What will be observed in the environment and what receives attention as a problem or a quality is overdetermined in a manner we can now reconstruct more precisely. The construction of the environment is shaped by community identities and associated observations, by actor identities and strategies in governance, and third by the pattern of opacity and transparency generated by the governance system itself (cf. [78,114].

This also means that governance systems are shaped by their material environments in ways that are only partially observed and understood from within the system (Figure 5). Duineveld et al. speak of "material events", events and processes in the environment that can affect communities slowly or quickly, vaguely, or dramatically; observed and unobserved; and which can affect the governance systems in those communities through similarly diversified pathways [115]. Material events can slowly affect a community, then its livelihoods, and then dramatically its governance system (an uprising, a revolution).

Or, they can shock the governance system, as things cannot be coordinated anymore (an obliterating volcanic eruption) [116].
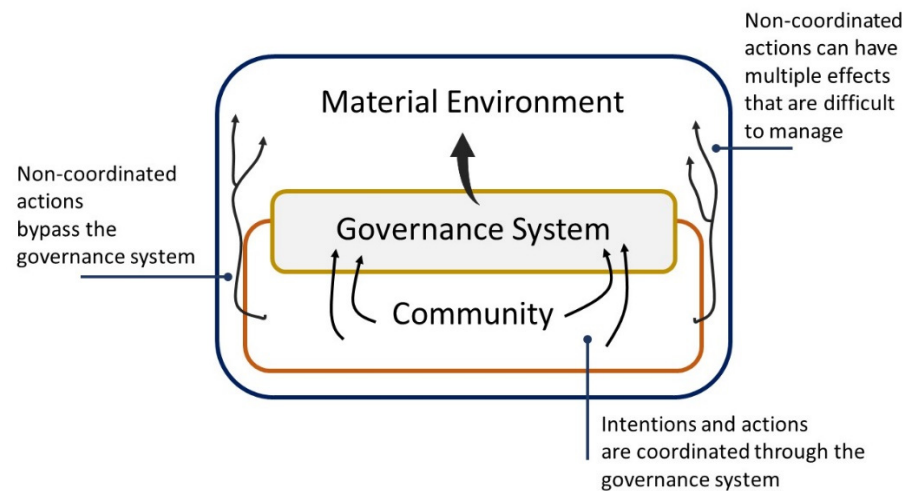

Figure 5. Environmental governance attempts to coordinate action affecting the environment, but this is never perfect. Non-coordinated action, either intentional or not, and benevolent or not, always exists and always produces effects invisible to the governance system.

The material dependencies introduced earlier can thus come through different paths, and those paths can only be understood if we acknowledge the role of discursivity. This role is there in case of problems and in case of qualities and resources recognized in the environment. Discourse can initiate a focused and searching observation of the environment, while shocks coming from the environment require interpretation through discourse (e.g., whether the change comes as a problem or is perceived more as an opportunity) [117]. The non-observation of an ecological shock, which is quite common, similarly becomes possible through discursive framing of the environment, possibly entwined with economic uses [79,97]. Invasive species and the changing quality and current of the water can upset the ecosystem and make a new fish dominant, but if it tastes fine and is not too difficult to catch, the fish might be observed by fishermen, but not the shock to the system. The slow framing and the structural reasons for the non-observation of the dawning Anthropocene are another, more dramatic, case in point [118].

Material events are thus not always observed, do not always lead to changing discourse, and even if so, they do not necessarily produce a reaction in governance. Material dependencies occur when material events, observed and unobserved, trigger changes in governance itself. Making them observable, often thanks to outside observers (or internal dissenting voices), can make them manageable.

6. Comprehensive and "Simple"

Drawing on the perspective introduced above, we can reflect on simple and more complex forms of environmental governance and the role of strategy. We speak of comprehensive environmental governance if complex institutions pursue complex goals. What is usually called transition or transformative change is usually associated with complex institutions or strategies coordinating other institutions, i.e., policies, plans, laws, and informal institutions [88]. It usually refers to ambitions to break path dependencies and interdependencies and to introduce new goal dependencies towards path creation [119].

EGT understands such strategies as narrative and institution and sees them as engendering goal dependencies (in governance) and reality effects (changing the world outside governance) (Figure 6). As environmental policy aims to change material conditions, strategy needs to be informed by a deep knowledge of the diverse dependencies in governance (as constraining and enabling factors), with a particular emphasis on material dependencies.
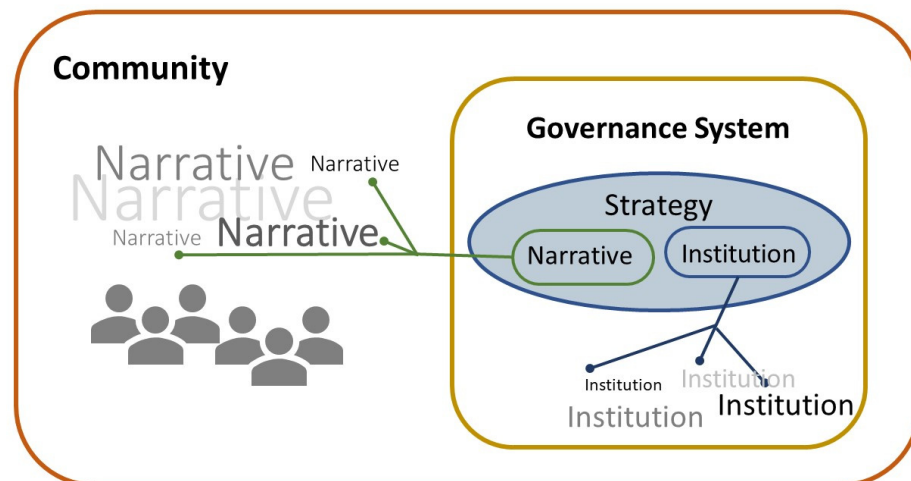
Figure 6. Strategy is both an institution and a narrative. As an institution, it coordinates other institutions within the governance system or governance arrangement in the community. As a narrative, it brings together, synthesizes, and/or coordinates different narratives within the community.

Ambitious and integrated governance strategies for transformative change will push the envelope and will, per definition, test the boundaries of steering and of governability. While an evolutionary perspective can shed light on these boundaries, it is also a useful perspective to elucidate the functioning of less-integrated environmental governance schemes. Such schemes, for example, specific environmental institutions (policy, plan, law) dealing with one aspect of the environment and/or one specific objective, can be simple in their overall goal and yet still remain ambitious. In some cases, as, e.g., with water management, internal complexity is still considerable, and the need to coordinate several institutions is still there [120]. Strategy is sometimes present, sometimes not, and long-term perspectives are sometimes encoded in the institution, but sometimes not.

As systems theory and historical institutionalism would acknowledge, the forms of organization, and the tools of coordination (institutions) used, have to build on previous organizations and institutions to maintain coordination in the process of changing policies but also to make any new or adapted policy understandable and legitimate [58,121]. Legitimacy becomes defined by meta-rules or meta-institutions governing what counts as an acceptable institution and an acceptable form of organization [122]. EGT would, in addition, point out that specific modes of observation might be missing in the governance system or that the material environment has been degrading for a long time, as the aspirations and self-images of the community, maybe its self-image as harmoniously co-existing with natural systems, were always problematic [44]. In settings of democratic governance, such observations cannot simply lead to technically directed change [123]. They ought to lead to new deliberation in the legitimate governance arenas, and if this does not work, those arenas must be contested or redefined in a legitimate manner [124]. In recent literature, this is often treated under the heading "participation", which assumes that increased and more direct participation leads to the better observation of and management of the environment. EGT would point out that sometimes this is the case, but that in each case, careful diagnosis of the couplings between governance, community, and environment needs to take place, and if the current balance between participation and representation creates environmental problems, this balance might have to be redressed [125]. Such redressing might include increased participation on a particular topic and a decision to relegate more power to experts on a different topic. It might include a speeding up of decision making for one environmental topic or a deliberate slowing down for a different issue considered more closely tied to identity politics [126,127].

EGT-inspired analyses of environmental governance do not generate immediate policy answers but tend to clarify for actors in governance and, if embedded in public discourse,

for the community itself, several important aspects of governance. For example, it can help to illustrate how co-evolutions in and around governance have created certain problems, but also how they have created assets and qualities, and how changing management of problems and qualities might require changes in governance that are constrained by the same co-evolutions that shaped the content of particular policies. EGT thus helps to discern how environmental policies are overdetermined; caused by many events, intentions, discourses, and actor strategies in governance; and are both enabled and constrained by the pattern and mode of reproduction of the configuration.

EGT also helps to see what is new and helps to locate environmental governance in social–ecological systems. It helps to identify that the effects of an environmental policy go beyond the intended effects on the environment and beyond the observed effects. As we know, what can be observed and how success or failure will be defined and measured results from the same set of contingent co-evolutions that created the policy [128]. This means that that which cannot be observed by the system in the production of the policy or in the interaction between actors and between actors and institutions cannot be observed in the environment as a result of the new policy, the new institution. Certainly, other observers, outside the logic of the governance system, might be able to observe differently and reinterpret a failure as success, or, more likely, the other way around [129].

An evolutionary perspective becomes more interesting if the couplings between governance configuration, community, and environment and the feedback in two directions in each connection are considered (Figure 7). More concretely, this means that an environmental policy, plan, or law will have effects not only on the environment but also on the community and the governance system itself [130,131]. This can be the case because environmental effects translate back into community effects which are then, either through formal politics or otherwise, translated into effects in governance [132]. What also occurs is that an environmental policy has more direct effects on governance before it is implemented and as part of a routine implementation, i.e., before external feedback occurs. By this, we mean that in the process of articulation, enactment, detailing, and implementation in a chain of actors, the policy will be affecting and be affected by power/knowledge and actor/institution configurations, both strategically and otherwise. A new policy can reshuffle powers between departments, change the value of one kind of expertise, alter the relation between different expert groups or between plans and one kind of policy, possibly create a new actor, and move a different policy and associated way of environmental measuring to the background [133]. All of these effects will have effects when, after a while, effects in the material environment become visible and other effects in the community also become visible. The feedback will enter a governance configuration that has already been altered by these more direct goal dependencies.
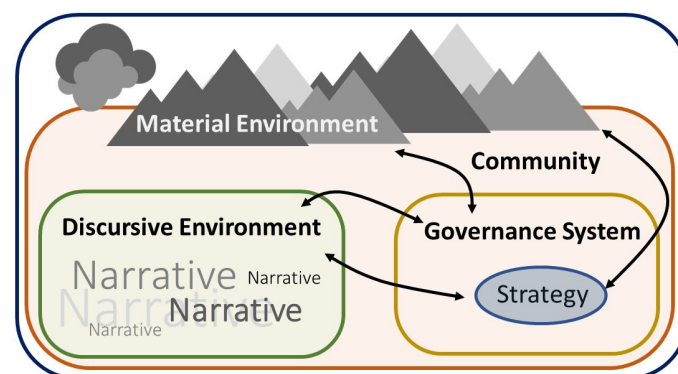

Figure 7. Material and discursive environments interact with each other. A community's discursive environment and material environment interact with its governance system and any strategy it conceives. Strategy can alter both discursive and material environments by changing or creating new narratives (discursive) and/or by changing or modifying the physical environment (material). A strategy has influence and should coordinate interactions with both of these environments.

7. Concluding Remarks

This paper explores how an evolutionary perspective can be useful for a better understanding of sustainability transformations, as well as all other forms of environmental policy and governance, ranging from conservation practices and natural resource management to many other forms of environmental policy and planning. A few concluding remarks can be made.

- First, the evolution of governance is driven by the observations communities make of their environment and in which certain things become labelled a resource; something worth using, managing, conserving, or protecting; or something that needs to be changed. Such observations are made from many different angles, and they differ in their impact on society and governance. Some social–environmental changes might even go unnoticed. Governance paths are marked by the multitude of observations that actors want to attract attention to, and that leads to further communication, often discussions, which then become translated into ambitions and goals and drive further strategizing, planning, and policy. These insights demand more attention to the discursive dimension of environmental governance, and in particular, the various ways in which social–material environments are observed and understood and how these different observations and understandings impact the dynamics in the governance system.
- Second, this perspective paper shows how an evolutionary understanding of governance can facilitate a more comprehensive and integrative perspective on governance. It allows linking different bodies of knowledge, such as works on institutions, agency, and discourses, and it fills gaps in current approaches, particularly when it comes to the temporal dimension, the various dependencies that shape the evolution of governance, and the functioning of power/knowledge.
- Third, an evolutionary perspective helps to delineate options for strategy and steering, and it facilitates a better understanding of how strategy and steering actually work, making it easier to evidence the effects of decisions on the environment, the community, and governance itself.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Not applicable.

References

1. Patterson, J.; Schulz, K.; Vervoort, J.; Van Der Hel, S.; Widerberg, O.; Adler, C.; Hurlbert, M.; Anderton, K.; Sethi, M.; Barau, A. Exploring the governance and politics of transformations towards sustainability. *Environ. Innov. Soc. Transit.* **2017**, *24*, 1–16. [CrossRef]
2. Markard, J.; Raven, R.; Truffer, B. Sustainability transitions: An emerging field of research and its prospects. *Res. Policy* **2012**, *41*, 955–967. [CrossRef]
3. Hansmeier, H.; Schiller, K.; Rogge, K.S. Towards methodological diversity in sustainability transitions research? Comparing recent developments (2016–2019) with the past (before 2016). *Environ. Innov. Soc. Transit.* **2021**, *38*, 169–174. [CrossRef]
4. Díaz, S.; Settele, J.; Brondízio, E.S.; Ngo, H.T.; Agard, J.; Arneth, A.; Balvanera, P.; Brauman, K.A.; Butchart, S.H.; Chan, K.M. Pervasive human-driven decline of life on Earth points to the need for transformative change. *Science* **2019**, *366*, eaax3100. [CrossRef] [PubMed]
5. Ekins, P.; Gupta, J.; Boileau, P. *Global Environment Outlook-GEO-6: Summary for Policymakers*; Cambridge University Press: Cambridge, UK, 2019.

6. Visseren-Hamakers, I.J.; Razzaque, J.; McElwee, P.; Turnhout, E.; Kelemen, E.; Rusch, G.M.; Fernández-Llamazares, Á.; Chan, I.; Lim, M.; Islar, M. Transformative governance of biodiversity: Insights for sustainable development. *Curr. Opin. Environ. Sustain.* **2021**, *53*, 20–28. [CrossRef]

7. Chaffin, B.C.; Garmestani, A.S.; Gunderson, L.H.; Benson, M.H.; Angeler, D.G.; Arnold, C.A.; Cosens, B.; Craig, R.K.; Ruhl, J.; Allen, C.R. Transformative environmental governance. *Annu. Rev. Environ. Resour.* **2016**, *41*, 399–423. [CrossRef] [PubMed]

8. Folke, C.; Hahn, T.; Olsson, P.; Norberg, J. Adaptive governance of social-ecological systems. *Annu. Rev. Environ. Resour.* **2005**, *30*, 441–473. [CrossRef]

9. Herrfahrdt-Pähle, E.; Schlüter, M.; Olsson, P.; Folke, C.; Gelcich, S.; Pahl-Wostl, C. Sustainability transformations: Socio-political shocks as opportunities for governance transitions. *Glob. Environ. Chang.* **2020**, *63*, 102097. [CrossRef]

10. Meadowcroft, J. Who is in charge here? Governance for sustainable development in a complex world. *J. Environ. Policy Plan.* **2007**, *9*, 299–314. [CrossRef]

11. Voß, J.-P.; Bauknecht, D.; Kemp, R. *Reflexive Governance for Sustainable Development*; Edward Elgar Publishing: Cheltenham, UK, 2006.

12. Pierson, P. *Politics in Time: History, Institutions, and Social Analysis*; Princeton University Press: Princeton, NJ, USA, 2004.

13. North, D.C. *Understanding the Process of Economic Change*; Princeton University Press: Princeton, NJ, USA, 2005.

14. Mahoney, J.; Thelen, K. (Eds.) *Explaining Institutional Change: Ambiguity, Agency, and Power*; Cambridge University Press: New York, NY, USA, 2010.

15. Ostrom, E. A general framework for analyzing sustainability of social-ecological systems. *Science* **2009**, *325*, 419–422. [CrossRef]

16. Colloff, M.J.; Martín-López, B.; Lavorel, S.; Locatelli, B.; Gorddard, R.; Longaretti, P.-Y.; Walters, G.; van Kerkhoff, L.; Wyborn, C.; Coreau, A. An integrative research framework for enabling transformative adaptation. *Environ. Sci. Policy* **2017**, *68*, 87–96. [CrossRef]

17. Newig, J.; Rose, M. Cumulating evidence in environmental governance, policy and planning research: Towards a research reform agenda. *J. Environ. Policy Plan.* **2020**, *22*, 667–681. [CrossRef]

18. Ellis, G.; Gerlak, A.K.; Daugbjerg, C.; Feindt, P.H.; Metze, T.; Wu, X. 21 years of research for the twenty-first century: Revisiting the journal of environmental policy and planning. *J. Environ. Policy Plan.* **2020**, *22*, 569–580. [CrossRef]

19. Partelow, S.; Schlüter, A.; Armitage, D.; Bavinck, M.; Carlisle, K.; Gruby, R.L.; Hornidge, A.-K.; Le Tissier, M.; Pittman, J.; Song, A.M. Environmental governance theories: A review and application to coastal systems. *Ecol. Soc.* **2020**, *25*, 19. [CrossRef]

20. Bornemann, B.; Strassheim, H. Governing time for sustainability: Analyzing the temporal implications of sustainability governance. *Sustain. Sci.* **2019**, *14*, 1001–1013. [CrossRef]

21. Ostrom, E.; Basurto, X. Crafting analytical tools to study institutional change. *J. Inst. Econ.* **2011**, *7*, 317–343. [CrossRef]

22. Groen, L.; Alexander, M.; King, J.P.; Jager, N.W.; Huitema, D. Re-examining policy stability in climate adaptation through a lock-in perspective. *J. Eur. Public Policy* **2022**, 1–25. [CrossRef]

23. Von Tunzelmann, N. Historical coevolution of governance and technology in the industrial revolutions. *Struct. Chang. Econ. Dyn.* **2003**, *14*, 365–384. [CrossRef]

24. Kemp, R.; Loorbach, D.; Rotmans, J. Transition management as a model for managing processes of co-evolution towards sustainable development. *Int. J. Sustain. Dev. World Ecol.* **2007**, *14*, 78–91. [CrossRef]

25. Volberda, H.W.; Lewin, A.Y. Co-evolutionary dynamics within and between firms: From evolution to co-evolution. *J. Manag. Stud.* **2003**, *40*, 2111–2136. [CrossRef]

26. van Knippenberg, K.; Boonstra, B.; Boelens, L. Communities, Heritage and Planning: Towards a Co-Evolutionary Heritage Approach. *Plan. Theory Pract.* **2021**, *23*, 26–42. [CrossRef]

27. Pottage, A. Power as an art of contingency: Luhmann, Deleuze, Foucault. *Econ. Soc.* **1998**, *27*, 1–27. [CrossRef]

28. Van Assche, K.; Beunen, R.; Duineveld, M. *Evolutionary Governance Theory: An Introduction*; Springer: Heidelberg, Germany, 2014.

29. Philippopoulos-Mihalopoulos, A. *Niklas Luhmann: Law, Justice, Society*; Routledge: London, UK, 2009.

30. Pressman, J.L.; Wildavsky, A.B. *Implementation: How Great Expectations in Washington Are Dashed in Oakland*, 2nd ed.; University of California Press: Berkeley, CA, USA, 1979; pp. xxiv, 209.

31. Barrett, S.M. Implementation Studies: Time for a Revival? Personal Reflections on 20 Years of Implementation Studies. *Public Adm.* **2004**, *82*, 249–262. [CrossRef]

32. Gunder, M.; Hillier, J. *Planning in Ten Words or Less: A Lacanian Entanglement with Spatial Planning*; Routledge: London, UK, 2016.

33. Stavrakakis, Y. *Lacan and the Political*; Routledge: London, UK, 2002.

34. Luhmann, N. *Ecological Communication*; University of Chicago Press: Chicago, IL, USA, 1989.

35. Pottage, A. The fabrication of persons and things. In *Law, Anthropology and the Constitution of the Social. Making Persons and Things*; Pottage, A., Mundy, M., Eds.; Cambridge University Press: Cambridge, UK, 2004; pp. 1–39.

36. Hacking, I. *The Taming of Chance*; Cambridge University Press: Cambridge, UK, 1990; Volume 17.

37. MacKenzie, D.; Muniesa, F.; Siu, L. (Eds.) *Do Economists Make Markets?: On the Performativity of Economics*; Princeton University Press: Princeton, NJ, USA, 2007; p. VI. 373p.

38. Teubner, G. How the Law Thinks: Towards a Constructivist Epistemology of Law. *Law Soc. Rev.* **1989**, *23*, 727–758. [CrossRef]

39. Walker, E.; Martin, A.; McCarthy, J. Confronting the State, the Corporation, and the Academy: The Influence of Institutional Targets on Social Movement Repertoires. *Am. J. Sociol.* **2008**, *114*, 35–76. [CrossRef]

40. Klijn, E.H.; Edelenbos, J.; Kort, M.; van Twist, M. Facing management choices: An analysis of managerial choices in 18 complex environmental public–private partnership projects. *Int. Rev. Adm. Sci.* **2008**, *74*, 251–282. [CrossRef]

41. Mintzberg, H.; Ghoshal, S.; Lampel, J.; Quinn, J.B. *The Strategy Process: Concepts, Contexts, Cases*; Pearson Education: London, UK, 2003.

42. Feindt, P.H.; Oels, A. Does discourse matter? Discourse analysis in environmental policy making. *J. Environ. Policy Plan.* **2005**, *7*, 161–173. [CrossRef]

43. Hajer, M.; Versteeg, W. A decade of discourse analysis of environmental politics: Achievements, challenges, perspectives. *J. Environ. Policy Plan.* **2005**, *7*, 175–184. [CrossRef]

44. Van Assche, K.; Beunen, R.; Duineveld, M.; Gruzmacher, M. Power/knowledge and natural resource management: Foucaultian foundations in the analysis of adaptive governance. *J. Environ. Plan. Policy* **2017**, *19*, 308–322. [CrossRef]

45. Leipold, S.; Feindt, P.H.; Winkel, G.; Keller, R. Discourse analysis of environmental policy revisited: Traditions, trends, perspectives. *J. Environ. Policy Plan.* **2019**, *21*, 445–463. [CrossRef]

46. Schmidt, V.A. Discursive institutionalism: The explanatory power of ideas and discourse. *Political Sci.* **2008**, *11*, 303. [CrossRef]

47. Larsson, O.L. Using Post-Structuralism to Explore The Full Impact of Ideas on Politics. *Crit. Rev.* **2015**, *27*, 174–197. [CrossRef]

48. Harvey, P.; Knox, H. *Roads: An Anthropology of Infrastructure and Expertise*; Cornell University Press: Ithaca, NY, USA, 2015.

49. Foucault, M. *Discipline and Punish: The Birth of the Prison*; Penguin Books: Harmondsworth, UK, 1979; p. 333.

50. Foucault, M. *Society Must Be Defended: Lectures at the College de France, 1975–1976*; Allen Lane The Penguin Press: London, UK, 2003.

51. Luhmann, N. *Social Systems*; Stanford University Press: Stanford, CA, USA, 1995.

52. Luhmann, N. *Theory of Society, Volume 1. Cultural Memory in the Present*; Stanford University Press: Stanford, CA, USA, 2012.

53. Beunen, R.; Van Assche, K.; Duineveld, M. *Evolutionary Governance Theory: Theory and Applications*; Springer: Heidelberg, Germany, 2015.

54. Van Assche, K.; Gruezmacher, M.; Deacon, L. Land use tools for tempering boom and bust: Strategy and capacity building in governance. *Land Use Policy* **2019**, *93*, 103994. [CrossRef]

55. Greif, A. *Institutions and the Path to the Modern Economy: Lessons from Medieval Trade*; Cambridge University Press: Cambridge, UK, 2006.

56. Acemoglu, D.; Robinson, J. *Why Nations Fail. The Origins of Power, Prosperity and Poverty*; Crown Business: New York, NY, USA, 2012.

57. Streeck, W.; Thelen, K. (Eds.) *Beyond Continuity: Institutional Change in Advanced Political Economies*; Oxford University Press: Oxford, UK, 2005.

58. Thelen, K. *How Institutions Evolve. The Political Economiy of Skills in Germany, Britain, the United States, and Japan*; Cambridge University Press: New York, NY, USA, 2004.

59. Hall, P.A. Historical institutionalism in rationalist and sociological perspective. In *Explaining Institutional Change: Ambiguity, Agency, and Power*; Mahoney, J., Thelen, K., Eds.; Cambridge University Press: Cambridge, UK, 2010; pp. 204–224.

60. North, D.C.; Wallis, J.; Weingast, B. *Violence and Social Orders. A Conceptual Framework for Interpreting Recorded Human History*; Cambrigde University Press: Cambridge, UK, 2009.

61. González, S.; Healey, P. A sociological institutionalist approach to the study of innovation in governance capacity. *Urban Stud.* **2005**, *42*, 2055–2069. [CrossRef]

62. Zenger, T.R.; Lazzarini, S.G.; Poppo, L. Informal and formal organization in new institutional economics. In *The New Institutionalism in Strategic Management*; Emerald Group Publishing Limited: Bingley, UK, 2000.

63. Greif, A.; Mokyr, J. Cognitive rules, institutions, and economic growth: Douglass North and beyond. *J. Inst. Econ.* **2017**, *13*, 25–52. [CrossRef]

64. Georgiou, I. The idea of emergent property. *J. Oper. Res. Soc.* **2003**, *54*, 239–247. [CrossRef]

65. Gertler, M.S.; Wolfe, D.A. Local social knowledge management: Community actors, institutions and multilevel governance in regional foresight exercises. *Futures* **2004**, *36*, 45–65. [CrossRef]

66. Whitney, K.; Bradley, J.M.; Baugh, D.E.; Jr, C.W.C. Systems theory as a foundation for governance of complex systems. *Int. J. Syst. Syst. Eng.* **2015**, *6*, 15–32. [CrossRef]

67. Risse, M. *On Global Justice*; Princeton University Press: Princeton, NJ, USA, 2012.

68. Will, M.G.; Roth, S.; Valentinov, V. From nonprofit diversity to organizational multifunctionality: A systems–theoretical proposal. *Adm. Soc.* **2018**, *50*, 1015–1036. [CrossRef]

69. Knill, C. Private governance across multiple arenas: European interest associations as interface actors. *J. Eur. Public Policy* **2001**, *8*, 227–246. [CrossRef]

70. Lahire, B. *The Plural Actor*; Polity: Cambridge, UK, 2011.

71. Beier, P.; Brost, B. Use of land facets to plan for climate change: Conserving the arenas, not the actors. *Conserv. Biol.* **2010**, *24*, 701–710. [CrossRef] [PubMed]

72. Turnhout, E.; van Bommel, S.; Aarts, N. How Participation Creates Citizens: Participatory Governance as Performative Practice. *Ecol. Soc.* **2010**, *15*, 26. [CrossRef]

73. Van Dam, R.; Duineveld, M.; During, R. Delineating active citizenship: The subjectification of citizens' initiatives. *J. Environ. Policy Plan.* **2015**, *17*, 163–179. [CrossRef]

74. Richardson, T.; Weszkalnys, G. Introduction: Resource materialities. *Anthropol. Q.* **2014**, *87*, 5–30. [CrossRef]

75. Liu, M.; Li, C. Competing discursive constructions of China's smog in Chinese and Anglo-American English-language newspapers: A corpus-assisted discourse study. *Discourse Commun.* **2017**, *11*, 386–403. [CrossRef]

76. Wagenaar, H. Transforming perspectives: The critical functions of interpretive policy analysis. In *Handbook of Critical Policy Studies*; Edward Elgar Publishing: Cheltenham, UK, 2015.

77. Broto, V.C. Symbolic violence and the politics of environmental pollution science: The case of coal ash pollution in Bosnia and Herzegovina. *Antipode* **2013**, *45*, 621–640. [CrossRef]

78. Molle, F.; Mollinga, P.P.; Wester, P. Hydraulic bureaucracies and the hydraulic mission: Flows of water, flows of power. *Water Altern.* **2009**, *2*, 328–349.

79. Keane, W. Semiotics and the social analysis of material things. *Lang. Commun.* **2003**, *23*, 409–425. [CrossRef]

80. Kornberger, M. *Strategies for Distributed and Collective Action: Connecting the Dots*; Oxford University Press: Oxford, UK, 2022.

81. Hajer, M.A. *The Politics of Environ. Discourse: Ecological Modernization and the Policy Process*; Clarendon: Oxford, UK, 1995; p. 332.

82. Voß, J.-P. Innovation processes in governance: The development of 'emissions trading'as a new policy instrument. *Sci. Public Policy* **2007**, *34*, 329–343. [CrossRef]

83. Foucault, M. *The Will to Knowledge. The History of Sexuality: 1*; Penguin Books: London, UK, 1998; Volume 1.

84. Derrien, M.M.; Stokowski, P.A. Discursive constructions of night sky experiences: Imagination and imaginaries in national park visitor narratives. *Ann. Tour. Res.* **2020**, *85*, 103038. [CrossRef]

85. Foucault, M. The subject and power. *Crit. Inq.* **1982**, *8*, 777–795. [CrossRef]

86. Foucault, M. *Birth of the Clinic: An Archaeology of Medical Perception*; Tavistock Publications: London, UK, 1973; p. 215.

87. Latour, B.; Woolgar, S. *Laboratory Life: The Construction of Scientific Facts*; Princeton University Press: Princeton, NJ, USA, 1986; 294p.

88. Smith, A.; Stirling, A. The politics of social-ecological resilience and sustainable socio-technical transitions. *Ecol. Soc.* **2010**, *15*, 11. [CrossRef]

89. Jarzabkowski, P.; Seidl, D.; Balogun, J. From germination to propagation: Two decades of Strategy-as-Practice research and potential future directions. *Hum. Relat.* **2022**, *75*, 1533–1559. [CrossRef]

90. Van Assche, K.; Duineveld, M.; Gruezmacher, M.; Beunen, R. Steering as path creation. The art of managing dependencies and reality effects. *Politics Gov.* **2021**, *9*, 269–380. [CrossRef]

91. Vergne, J.P.; Durand, R. The missing link between the theory and empirics of path dependence: Conceptual clarification, testability issue, and methodological implications. *J. Manag. Stud.* **2010**, *47*, 736–759. [CrossRef]

92. Garud, R.; Kumaraswamy, A.; Karnøe, P. Path dependence or path creation? *J. Manag. Stud.* **2010**, *47*, 760–774. [CrossRef]

93. Pierson, P. Increasing returns, path dependence, and the study of politics. *Am. Political Sci. Rev.* **2000**, *94*, 251–267. [CrossRef]

94. North, D.C. *Institutions, Institutional Change and Economic Performance*; Cambridge University Press: Cambridge, UK, 1990; p. 152.

95. Kay, A. A critique of the use of path dependency in policy studies. *Public Adm.* **2005**, *83*, 553–571. [CrossRef]

96. Latour, B. *Politics of Nature. How to Bring the Sciences into Democracy*; Harvard University Press: Cambridge, MA, USA, 2004.

97. Valentinov, V.K. William Kapp's theory of social costs: A Luhmannian interpretation. *Ecol. Econ.* **2014**, *97*, 28–33. [CrossRef]

98. Van Assche, K.; Hornidge, A.-K.; Schlüter, A.; Vaidianu, N. Governance and the coastal condition: Towards new modes of observation, adaptation and integration. *Mar. Policy* **2020**, *112*, 103413. [CrossRef]

99. De Boeck, F. Infrastructure: Commentary from Filip de Boeck. *Cultural Anthropology*. 2012. Available online: https://journal.culanth.org/index.php/ca/infrastructure-filip-de-boeck (accessed on 6 August 2022).

100. Van Assche, K.; Duineveld, M.; Beunen, R.; Valentinov, V.; Gruezmacher, M. Material dependencies: Hidden underpinnings of sustainability transitions. *J. Environ. Policy Plan.* **2022**, *24*, 281–296. [CrossRef]

101. Van Assche, K.; Verschraegen, G.; Gruezmacher, M. Strategy for collectives and common goods: Coordinating strategy, long-term perspectives and policy domains in governance. *Futures* **2021**, *128*, 102716. [CrossRef]

102. Wilshusen, P.R. Environmental governance in motion: Practices of assemblage and the political performativity of economistic conservation. *World Dev.* **2019**, *124*, 104626. [CrossRef]

103. Duineveld, M.; Van Assche, K.; Beunen, R. Making things irreversible. Object stabilization in urban planning and design. *Geoforum* **2013**, *46*, 16–24. [CrossRef]

104. Van Assche, K.; Beunen, R.; Gruezmacher, M.; Duineveld, M. Rethinking strategy in environmental governance. *J. Environ. Policy Plan.* **2020**, *22*, 695–708. [CrossRef]

105. Hukkinen, J. Sustainability scenarios as interpretive frameworks for indicators of human-environment interaction. In *Sustainable Development Indicators in Ecological Economics*; Edward Elgar Publishing: Cheltenham, UK, 2006; pp. 291–316.

106. Carrozza, C. Democratizing expertise and environmental governance: Different approaches to the politics of science and their relevance for policy analysis. *J. Environ. Policy Plan.* **2015**, *17*, 108–126. [CrossRef]

107. Zhu, D.; Ru, J. Strategic environmental assessment in China: Motivations, politics, and effectiveness. *J. Environ. Manag.* **2008**, *88*, 615–626. [CrossRef] [PubMed]

108. Turnhout, E.; Tuinstra, W.; Halffman, W. *Environmental Expertise: Connecting Science, Policy and Society*; Cambridge University Press: Cambridge, UK, 2019.

109. Kunseler, E.-M.; Vasileiadou, E. Practising environmental policy evaluation under co-existing evaluation imaginaries. *Evaluation* **2016**, *22*, 451–469. [CrossRef]

110. Pierre, J.; Peters, B.G. *Governance, Politics, and the State*; Macmillan: Basingstoke, UK, 2000.

111. Rhodes, R.A. Understanding governance: Ten years on. *Organ. Stud.* **2007**, *28*, 1243–1264. [CrossRef]

112. Scoones, I. *Sustainable Rural Livelihoods: A Framework for Analysis*; IDS: Brighton, UK, 1998; Volume 72.

113. Keane, W. Perspectives on affordances, or the anthropologically real: The 2018 Daryll Forde Lecture. *HAU J. Ethnogr. Theory* **2018**, *8*, 27–38. [CrossRef]

114. Sidortsov, R.; Ivanova, A.; Stammler, F. Localizing governance of systemic risks: A case study of the Power of Siberia pipeline in Russia. *Energy Res. Soc. Sci.* **2016**, *16*, 54–68. [CrossRef]

115. Duineveld, M.; Van Assche, K.; Beunen, R. Re-conceptualising political landscapes after the material turn: A typology of material events. *Landsc. Res.* **2017**, *42*, 375–384. [CrossRef]

116. Van Assche, K.; Gruezmacher, M.; Beunen, R. Shock and Conflict in Social-Ecological Systems: Implications for Environmental Governance. *Sustainability* **2022**, *14*, 610. [CrossRef]
117. Hulme, M. *Why We Disagree about Climate Change: Understanding Controversy, Inaction and Opportunity*; Cambridge University Press: Cambridge, UK, 2009.
118. Bonneuil, C. *The Shock of the Anthropocene: The Earth, History and Us*; Verso Books: London, UK, 2016.
119. Hansen, T.; Coenen, L. The geography of sustainability transitions: Review, synthesis and reflections on an emergent research field. *Environ. Innov. Soc. Transit.* **2015**, *17*, 92–109. [CrossRef]
120. Pahl-Wostl, C. An evolutionary perspective on water governance: From understanding to transformation. *Water Resour. Manag.* **2017**, *31*, 2917–2932. [CrossRef]
121. Kornberger, M. Governing the city: From planning to urban strategy. *Theory Cult. Soc.* **2012**, *29*, 84–106. [CrossRef]
122. La Cour, A.; Højlund, H. Polyphonic Supervision—Meta-governance in Denmark. *Syst. Res. Behav. Sci.* **2017**, *34*, 148–162. [CrossRef]
123. Voß, J.-P.; Freeman, R. *Knowing Governance: The Epistemic Construction of Political Order*; Palgrave Macmillan London: London, UK, 2016.
124. Dryzek, J.S. *The Politics of the Earth: Environmental Discourses*; Oxford University Press: Oxford, UK, 2013.
125. Cornwall, A.; Coelho, V.S. *Spaces for Change?: The Politics of Citizen Participation in New Democratic Arenas*; Zed Books: London, UK, 2007; Volume 4.
126. van de Mosselaer, F.; Duineveld, M. Strategic openings: On the productivity of blended long-term perspectives in spatial strategy. A Dutch case study. *Futures* **2021**, *130*, 102752. [CrossRef]
127. Tate, W. Anthropology of policy: Tensions, temporalities, possibilities. *Annu. Rev. Anthropol.* **2020**, *49*, 83–99. [CrossRef]
128. Leong, C.; Howlett, M. Policy Learning, Policy Failure, and the Mitigation of Policy Risks: Re-Thinking the Lessons of Policy Success and Failure. *Adm. Soc.* **2021**, *54*, 1379–1401. [CrossRef]
129. Fuchs, S. *Against Essentialism: A Theory of Culture and Society*; Harvard University Press: Cambridge, MA, USA, 2001; p. 9. 380p.
130. Thygesen, N. Steering technologies as observation. *Cybern. Hum. Knowing* **2007**, *14*, 151–172.
131. Neisig, M. The circular economy: Rearranging structural couplings and the paradox of moral-based sustainability-enhancing feedback. *Kybernetes* **2021**, *51*, 1896–1914. [CrossRef]
132. Spash, C.L. Broadening democracy in environmental policy processes. *Environ. Plan. C Gov. Policy* **2001**, *19*, 475–481. [CrossRef]
133. Forsyth, T. *Critical Political Ecology: The Politics of Environmental Science*; Routledge: London, UK, 2004.