

University of Vermont

UVM ScholarWorks

College of Arts and Sciences Faculty
Publications

College of Arts and Sciences

2-16-2019

Deliberation and the promise of a deeply democratic sustainability transition

Michael B. Wironen
University of Vermont

Robert V. Bartlett
University of Vermont

Jon D. Erickson
University of Vermont

Follow this and additional works at: <https://scholarworks.uvm.edu/casfac>



Part of the [Climate Commons](#), [Community Health Commons](#), [Human Ecology Commons](#), [Nature and Society Relations Commons](#), [Place and Environment Commons](#), and the [Sustainability Commons](#)

Recommended Citation

Wironen MB, Bartlett RV, Erickson JD. Deliberation and the promise of a deeply democratic sustainability transition. *Sustainability*. 2019 Jan;11(4):1023.

This Article is brought to you for free and open access by the College of Arts and Sciences at UVM ScholarWorks. It has been accepted for inclusion in College of Arts and Sciences Faculty Publications by an authorized administrator of UVM ScholarWorks. For more information, please contact scholarworks@uvm.edu.

Review

Deliberation and the Promise of a Deeply Democratic Sustainability Transition

Michael B. Wironen ^{1,2,*} , Robert V. Bartlett ^{2,3} and Jon D. Erickson ^{1,2,*} 

¹ Rubenstein School of Environment and Natural Resources, University of Vermont, Burlington, VT 05405, USA

² Gund Institute for Environment, University of Vermont, Burlington, VT 05405, USA; robert.v.bartlett@uvm.edu

³ Department of Political Science, University of Vermont, Burlington, VT 05405, USA

* Correspondence: mwironen@uvm.edu (M.B.W.); jon.erickson@uvm.edu (J.D.E.)

Received: 21 December 2018; Accepted: 11 February 2019; Published: 16 February 2019



Abstract: Ecological economics arose as a normative transdiscipline aiming to generate knowledge and tools to help transition the economy toward a scale which is sustainable within the bounds of the earth system. Yet it remains unclear in practice how to legitimize its explicitly normative agenda. One potential means for legitimation can be found in deliberative social and political theory. We review how deliberative theory has informed ecological economics, pointing to three uses: first, to support valuation of non-market goods and services; second, to inform environmental decision-making more broadly; third, to ground alternative theories of development and wellbeing. We argue that deliberation has been used as problem-solving theory, but that its more radical implications have rarely been embraced. Embracing a deliberative foundation for ecological economics raises questions about the compatibility of deeply democratic practice and the normative discourses arguing for a sustainability transition. We highlight three potential mechanisms by which deliberation may contribute to a sustainability transition: preference formation; normative evaluation; and legitimation. We explore each in turn, demonstrating the theoretical possibility that deliberation may be conducive in and of itself to a sustainability transition. We point to a series of challenges facing the “scaling up” of deliberative systems that demand further empirical and theoretical work. These challenges constitute a research agenda for a deeply democratic sustainability transition and can inform the future development of ecological economics and other normative, critical transdisciplines.

Keywords: deliberative democracy; sustainability transitions; ecological economics; normative science; modernity; social-ecological transformations

1. Introduction

Growing concern about the extent of human impact on the planet and growing awareness of the deep interconnectedness of social and ecological systems have led to the emergence of solutions-oriented science that spans traditional disciplinary boundaries. In this vein, conservation biology [1], ecological economics [2], sustainability science [3], agroecology [4], political ecology [5], and other “transdisciplines” aim to bridge theory and practice with a critical, normative framing that guides research. This framing can be simple, often relayed in pragmatic terms: for example, the world’s ecosystems are suffering; biodiversity is intrinsically and instrumentally valuable; and we should do something to protect it. It is in this sense that Michael Soulé [1] (p. 727) described conservation biology as “a crisis discipline.” Conversely, the framing can be more reflexive, building on a constructivist critique of science.

A central challenge for all science, crisis or not, is recognizing and acknowledging the normative content guiding the descriptive, critical, and prescriptive aspects of research [6]. This challenge becomes especially pronounced for science oriented toward an explicit normative goal, such as a sustainability transition. In response, some suggest that scientists should draw a sharp line separating research from advocacy or direct action (recalling Hume's Guillotine and a positivist stance toward science) [7]. Others, echoing hermeneutics, see the two as intrinsically connected, for example in participatory action research [4]. An underlying question is whether and how the normative content guiding science and advocacy can be justified or legitimated [8]. Is legitimacy conferred via an appeal to authority (e.g., the scientist as member of the scientific establishment); or to process (e.g., science as a product of peer review by credentialed experts); or to reason (e.g., prescriptive advice based on a reasoned review of the facts)? Or via some other claim? The line between scientist working in a discipline and activist participating in a social movement is both uncertain and contested.

Ecological economics exemplifies the challenges facing normative transdisciplinary science. Emerging as a critique of the implicit values of orthodox economics—namely, an un-reflexive idolization of efficiency and growth—ecological economists argue that these same values are, in part, to blame for the social and ecological crises facing the planet [9–12]. The starting point is an ontology that sees the economy as a subset of humanity's myriad social institutions, with the social sphere itself embedded in the broader ecosystem or environment [13,14]. Ecological economists, among others, have used this shared ontology to challenge orthodox thinking that ignores or underemphasizes the human species' fundamental embeddedness in nature [2]. Like other explicitly normative fields, the critique is situated within a broader appeal for a transition toward an alternative social arrangement [15].

In ecological economics, one prominent framing of the alternative is that of Daly [16], where an ecological (or steady-state) economy is one that achieves sustainable scale, just distribution, and efficient allocation. Setting aside whether this vision is representative, it illustrates a tension in the broader literature—can the value claims of a transdisciplinary normative science be legitimated, and if so, how? In work agitating for a sustainability transition, how does the vision garner social legitimacy? While ecological economics may originate in a critique of economics, it does not fully embrace a more radical interpretation of economics as social theory [17]. In justifying goals, Daly [16] and more recently Daly and Farley [18] mix appeals to instrumental reason (recalling the "nature's benefits" or ecosystem services strand of the literature) with more metaphysical arguments about intrinsic value and the "ultimate ends" that guide human life. Presumably, one who finds these claims compelling will embrace the arguments and recommendations; if not, one is free to choose another author of closer ideological alignment.

Our point is not to impugn the value of ecological economics or Daly and Farley's work in particular. Nor is it to paint all normative scholarship aimed at a sustainability transition as theoretically ungrounded. Rather, it is to highlight an important, unresolved question: how can competing value-claims be justified or legitimated so as to create some basis for collective action? What is the normative theory that underpins normative science? As Cooke [8] (p. 379) notes, "Critical social theories . . . (rely) on a number of important assumptions about human nature, society and history, above all, the assumptions that human beings are formed . . . by the social arrangements in which they are involved in their everyday lives and that these social arrangements are neither naturally necessary, nor divinely ordained nor historically inevitable." What then, if anything, can ground social critique?

Rather than reflect some defect in the literature or the science, we argue that questions around normative legitimation reflect ongoing debates about ecological economics' relationship to modernity. We argue that some ecological economists have begun to embrace a possible answer—deliberative social and political theory—but tentatively, in a problem-solving capacity. The problem-solving utility of deliberative theory in ecological economics is indisputable, but we contend that a deeper embrace could draw on the radical transformative potential of democratic deliberation, which has been underrepresented in ecological economics, despite featuring prominently in work from other disciplines on sustainability transitions and related topics (see for example [19–21]). The proposed

connections between deliberation and social-ecological transformation raise the possibility that deliberation can simultaneously nurture a sustainability transition and give rise to the transition in and of itself; further empirical and theoretical work is needed to understand how these relationships manifest in society. Finally, we raise questions that constitute a research agenda for a deeply democratic sustainability transition, tying this to a reflection on the scope and reach of ecological economics as a normative, critical transdiscipline. To date, much scholarship has addressed deliberative theory broadly and in the context of environmental policy and management. This paper seeks to contribute to this broader literature by explicitly reviewing the impact and relevance of deliberative theory to ecological economics and, indirectly, the broader literature on sustainability transitions.

2. Normative Science and the Crisis of Late Modernity

The current social-ecological predicament—encapsulated in the notion of an Anthropocene epoch—is very much a product of modernity. The rise of modernity in the West—manifested in the Enlightenment, the emergence and spread of capitalism, and growing techno-scientific power or mastery over nature—saw subject-centered reason triumph in a process of “disenchantment,” or shedding of traditional values and forms of social reproduction [22]. In pre-modernity, normative legitimacy derived from widely-shared faith in an external source of validity (e.g., tradition, the church, the sovereign), whereas in modernity, a human’s innate capacity to reason provides the source of legitimacy [23].

An optimistic take on modernity sees the rapid advance of science and technology, enabled via the application of reason, as a source of growing power and control over our collective fate. There are parallels with contemporary environmental discourses such as eco-modernism [24] where the current ecological predicament is deemed resolvable through the application of more reason (e.g., getting the prices right) and technology, the product of that reason. The notion of a strong fact and value dichotomy is typical of modern thought [25], wherein facts are objectively visible and knowable to all through science and reason, whereas values are subjective, with vestiges of the mystical. The neoclassical adage of mainstream economics—“*de gustibus non est disputandum*”—captures this elegantly: we can agree on external facts, instrumental reasons for action (e.g., efficiency), but our subjective valuations cannot be compared in a defensible manner [26].

A pessimistic take views modernity’s liberational promise as false: new forms of domination replace older forms, masquerading as subject-centered reason [27]. Reason and human consciousness are not sublime; they are constructed from a socially and historically infused muck. If modernity reveals anything, it is that all truth-claims are suspect, especially those claiming to be universal [28]. Domination in the name of an absent god is replaced by secular forms of domination. In practice, the post- or anti-modern critique can take the form of an extreme skepticism bordering on complete relativism about truth claims [23]. Any attempt to judge one subjective claim as superior to another is a form of domination [29].

These two extreme interpretations set out the guideposts for our discussion of the challenge facing normative science. Clearly, the scientific pursuit of knowledge has furnished great power to understand and manipulate the world around us. Yet the postmodern critique is a necessary caution, because power frequently dons the guise of liberational discourse. While modernity is a phenomenon that emerged in a particular place and cultural context, it has not obliterated all pre-modern or anti-modern societies and discourses. Values exist and matter, especially in the context of collective action. To agree on a shared vision or set of value claims (“what ought to be”) is always to agree on some form of social truth, however contingent.

The crisis of late modernity is the simultaneous rejection of external sources of normative legitimacy and recognition of the limits of subject-centered reason. If subjective decisions, enabled by science and technology, yield consequences that threaten the entire human endeavor, what should be done? The critical theory of the rationalization of society—where instrumental rationality crowds out forms of value rationality—echoes the ecological economics critique of an economic system blindly

pursuing growth and efficiency, neglecting and sometimes undermining the values and systems central to lived experience as humans. Per Habermas [29] (p. 355), “processes of monetarization and bureaucratization penetrate the core domains of cultural reproduction, social integration, and socialization.” The extension of bureaucratic and economic systems into the social world alienates individuals from control over the lifeworld and, in the end, threatens social integration. As Fergus and Rowney [30] (p. 25) note, “non-economic social frameworks, institutions, and cultural traditions have less and less significance in the forming of society’s structures.” Indeed, “economic rationality has become so prevalent in our society that it is difficult to use language in everyday life without referring to the dictionary of economics” [26] (p. 22). This outcome is visible today, as political discourse repeatedly appeals to the logic of the marketplace to justify social positions, including the need to protect nature [31].

At the same time, the archetypal political institution of modernity, the Westphalian nation-state, struggles to keep pace with economic and social forces that extend beyond the bounds of a traditional polity [32,33]. Goods, services, people, ideas, and organisms routinely traverse distances that a century ago would have been unthinkable. The effects of these flows are multifarious, complicating governance and creating collective action problems that bedevil policymakers [34].

The heart of the challenge is one of normative commitment: how can plural individuals (and the myriad groups to which they affiliate) agree on a normative basis for collective action? How can value claims be evaluated and legitimized when both traditional sources of legitimacy and innate, subject-centered reason are suspect? One potential answer is to seek legitimacy in un-coerced communication, which may give rise to intersubjective forms of reason that can serve as the basis for collective action. This work of theory, prominently associated with Habermas [35,36], builds on the observation that when humans enter into communication, they seek to create a shared understanding via deliberation to solve everyday problems, including making complex, value-imbued decisions. The speech act becomes the fundamental building block for constructing deliberative or “discursive” institutions that can navigate the complex landscape of late modernity [37].

The intersubjective, deliberative approach to understanding normative legitimacy has been widely embraced in the governance literature. Deliberative democracy has been touted as a means for moving beyond the limitations of interest-group liberalism [37–39]. Deliberative processes have been proposed to facilitate the creation of shared preferences and norms to guide environmental policy at the local, regional, and national levels and in new domains of “earth system governance” [40,41]. Deliberative theory has also been included, albeit on a more limited basis, in ecological economics and the sustainability transition literature.

3. Deliberation in Ecological Economics

Ecological economists have drawn on deliberative social and political theory since at least the 1980s. In a review, Zografos and Howarth [42] (p. 7) highlighted two areas where deliberative theory and ecological economics have aligned: first, in the context of environmental decision-making and, second, in a critique of the ability of a “growth-oriented, capitalist economy to genuinely integrate environmental goals in its operation.” The first topic has been the focus of much of the literature, wherein deliberation has been used as problem-solving theory in the sense of Cox [43]. For example, deliberation has been proposed as a means for valuing non-market goods and services in the context of cost-benefit analysis. It has also been presented as a means of “democratizing” decision-making in multi-criteria and structured decision-making processes. Yet there remains tension between the democratic, process-focused use of deliberation in decision-making and the normative goals of ecological economics. This is captured in Robert Goodin’s [44] (p. 168) oft-quoted remark that “to advocate democracy is to advocate procedures, to advocate environmentalism is to advocate substantive outcomes.” Deliberative theory points to a means to deepen democracy, helping legitimate normative evaluation in the face of a daunting plurality of perspectives. It also provides a means to grapple in the public sphere with contested concepts such as justice and wellbeing that are of central

concern to a sustainability transition. But since deliberation emphasizes the procedural, the outcomes cannot be fore-ordained.

The second topic, which, following Cox [43], draws on deliberative social and political theory as critical theory, is a point of alignment less developed in the ecological economics literature. However, one area in which deliberation has supported a (potentially) more radical critique of economic orthodoxy is in grounding alternative theories of development, such as the capabilities approach. In this section, we review in turn two problem-solving uses of deliberation in ecological economics—valuation of nonmarket goods and services and support of multicriteria decision-making—as well as this more fledgling, critical use.

3.1. Deliberation and Valuing Non-Market Goods and Services

Mark Sagoff [45] was an early proponent of the value of deliberative theory for ecological economics, calling for juristic deliberation to support the formation and negotiation of environmental and social values in collective decision-making. Sagoff's work started from a critique of welfare economics, specifically the use of cost-benefit analysis as a decision tool. Cost-benefit analysis and its foundational assumptions have received withering critique in the ecological economics literature, including that: contrary to assumptions, preferences are incomplete, especially with regard to non-market goods [46]; contingent valuation and other methods give inconsistent, seemingly arbitrary results [47]; experimental evidence challenges welfarist assumptions about human psychology [48]; treating all values as commensurable (and monetizable) does not reflect actual human values [49,50]; the process can be analyst-driven and opaque, undermining its legitimacy [51]; and efficiency (as welfare maximization) is neither a neutral nor universal goal [48,52,53]. This broad critique reveals a general concern in ecological economics that public decision-making may not accurately reflect the value that people ascribe to nature and non-market social relations, not to mention the potential value to future generations and non-human nature [54].

Many ecological economists have criticized the dominance of rational choice and revealed preference theory in economics, arguing, among other things, that they may not hold when applied to public goods and other aspects of the natural and social world that lie outside a market. Indeed, valuation may be approached from at least two distinct perspectives: that of a consumer, emphasizing the contribution to an individual's personal utility or particular interests; and that of a citizen, emphasizing the contribution to social utility or the general interest [55]. As a consumer, a person may have no idea how much an endangered species is worth, either in dollars or utils, since it is not a decision they have grappled with before. More generally, as a citizen that same person may not grasp the value of an endangered species for society or the laws designed for its protection. Following this line of reasoning, it is asking too much to ask someone to complete willingness-to-pay surveys or vote on the value of endangered animals and plants without any further context [56]. Their subjective preferences are not fully-formed, never mind complete, consistent, and transitive [57].

Deliberation has been proposed as a means toward better valuation by supporting preference formation [51,58–61]. For example, in deliberative monetary valuation (DMV), participants are exposed to important scientific and policy context about an issue and are then asked to deliberate in small groups prior to making an individual (via stated preference survey, subsequently aggregated) or group valuation (via consensus or voting) [51]. The DMV design can vary, impacting the result, but the basic intent is to help participants form preferences about the issues at hand. The public aspect of deliberation helps expose participants to different perspectives—technical, moral, and so on—that they may not have come across independently, and can help reveal which claims have public support and can withstand scrutiny [58,62]. Decisions made on the basis of DMV may better reflect reasoned individual (consumer) and public (citizen) values, at least when compared to processes that lack a deliberative element.

3.2. Deliberation and Multi-Criteria Decision-Making

In ecological economics, some reject cost-benefit analysis tout court, arguing for example that tradeoffs among competing values are best understood as “weakly commensurable” and hence incompatible with monetary valuation [49,63]. Participants may hold lexicographic preferences, for example with regard to impacts on sacred sites [64]. In situations such as these, DMV may be inadequate, necessitating alternative approaches such as multi-criteria, structured, or consensus-based decision-making, all of which have been embraced in ecological economics [2,65–67].

Multi-criteria approaches are not necessarily deliberative; they may be entirely analyst-driven and aggregative of individual preferences. But like DMV, they can integrate deliberation and support both quantitative and qualitative methods [67,68]. Insofar as affected parties (or at least their perspectives) are represented in the process, deliberation can confer legitimacy [38]. For example, structured decision-making, which builds off a multi-attribute utility framework, can integrate deliberation throughout the decision-making process to support problem definition, preference formation, choice, and legitimation [69]. Taking this further, consensus-oriented decision methods, which hew more closely to the Habermasian ideal, demand the careful evaluation of claims such that a consensus choice can emerge [41,70]. This is the basis for the juristic model of decision-making, which has been explored widely in the governance literature but less frequently in ecological economics.

In ecological economics, deliberation also aligns with the transdiscipline’s normative commitment to valuing non-scientific sources of knowledge, such as traditional ecological knowledge [71]. Deliberation provides forums in which non-scientific knowledge and expertise, as well as values, can be shared and evaluated, contributing to the legitimation function of deliberation [49,72].

3.3. Deliberation and Alternative Theories of Development

Zografos and Howarth [42] argue that ecological economics and deliberative theory align in a shared critique of the ability of capitalism to substantively incorporate environmental values. Although there is certainly potential alignment, the broader sociological critique of capitalism and modern society—a central component of critical theory—has received scant attention in ecological economics. The closest parallel is in attempts by ecological economists to decouple economic development as qualitative improvement from that of quantitative growth in biophysical throughput [9].

Ecological economists have extensively criticized the idolization of growth in mainstream economics, re-centering the economic process on the production of “an immaterial flux of the enjoyment of life,” to use the language of Georgescu-Roegen [73] (p. 353). There have been numerous proposals for what development could or should constitute in the sustainability transition, many of which propose specific outcomes or material endowments [74–80]. Given the contested, socially constructed nature of development as a concept, these alternative proposals are subject to the same problems of normative evaluation and legitimation to which deliberation responds in the context of public decision-making.

One alternative approach to defining development is the capabilities approach, which has been somewhat embraced within ecological economics. The capabilities approach is fundamentally deliberative, in that it relies on “public reasoning” as a means for justifying a subjective, particular notion of development [81–83]. An individual’s choices must withstand public scrutiny, unlike traditional welfarist concepts of utility maximization built on utilitarian ethics [84–86]. Sen [81,87,88] has developed a robust critique of utilitarian ethics in welfare economics, broadly criticizing its indifference to distribution, its neglect of rights, freedoms, and other non-utility concerns, and its inability to factor in mental conditioning and subjective interpersonal comparisons. In contrast, the capabilities approach places emphasis on “the substantive freedoms—the capabilities—to choose to live a life one has reason to value” [81] (p. 74). This draws a distinction between the freedom to use capabilities (the procedural aspect) and the actual use made of capabilities (the outcome, or functionings), emphasizing that economics is typically concerned with outcomes and not possible choices [85,89]. In this sense, the capabilities approach reemphasizes the importance of institutions

in providing individuals with both specific capabilities (e.g., health, education) and the freedom to exercise those capabilities (e.g., via security, guarantee of basic rights) [90].

At the heart of the capabilities approach is a concept of freedom based on the notion that one must use public reason to justify that which one values [81,87]. This demands that individuals legitimize claims about their freedoms and how they exercise them, thereby creating and contributing to social norms that govern choices. This provides room for plural concepts of value and justice to coexist, insofar as they can be reconciled via deliberation (a “bounded” form of value pluralism).

In ecological economics, the capabilities approach has been incorporated in a problem-solving sense: to understand the relationship between nature and human development [85,91]; to examine conflict [92]; in the context of intergenerational equity [93]; and in its broader sense of providing a basis for understanding the “social” objectives of economic activity [76,84,94–96]. There remains tension, however, between the procedural focus on public reasoning that undergirds the capabilities approach and the normative “sustainability” goals of ecological economics. And importantly, what Sen remains silent about is whether and how the larger political-economic edifice needs to change to create the vibrant public sphere so essential to the capabilities approach.

4. Deliberation as Catalyst for a Sustainability Transition

Ecological economics is motivated by general concern about the impacts of human society on the earth system and the feedbacks that this might engender. In evaluating how to transition toward a less impactful and more just future, deliberative political and social theory have been helpful in solving problems related to valuation, decision-making, and grounding alternative concepts for human development. Yet given the open-endedness of deliberative processes, the question remains whether deliberation can be a reliable partner in a sustainability transition, especially when the goals remain mutable, opaque, and contested.

Several central functions of deliberation—including preference formation, normative evaluation, and legitimation—provide potential feedbacks that could advance a “sustainable” social-ecological transformation. For each function, there are multiple approaches that fall on a spectrum of deliberative designs (Figure 1). These functions can contribute to mechanisms by which deliberation can scale to create a more reflexive society.

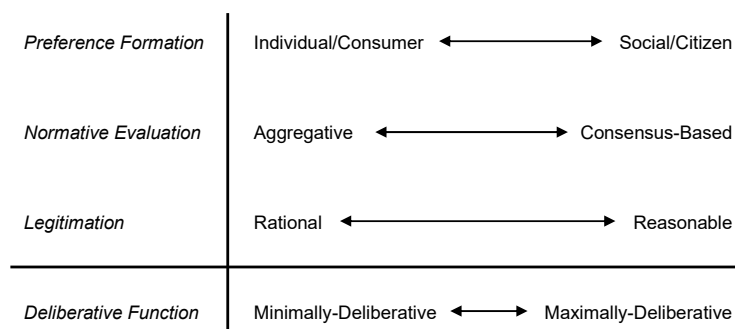


Figure 1. Deliberative functions and the range of potential approaches from minimally- to maximally-deliberative.

4.1. Deliberation and Preference Formation

Deliberation directly contributes to preference formation. In entering into deliberation, a participant is signaling a willingness to be exposed to new facts and perspectives—to listen and learn—that may change their preferences regarding an issue or topic. Passive exposure to information may help shape an individual’s preferences, without necessarily demanding engagement with broader questions of social or public concern. But deliberation goes further, with passive processes complemented by an active process of discussion with other members of the deliberative community. This communicative process involves the sharing of different perspectives and the making of normative claims and is ideally representative of the broader community affected by a particular decision or issue

of concern. Representation can be at the level of the individual or group (following more traditional liberal theory) or the discourse (following more critical discursive theory) [97].

For complex environmental and social issues that lie outside routine experience, deliberative settings provide for a public, social process of learning. This is one reason for the emergence of deliberative monetary valuation as an antidote to contingent valuation. At a minimum, deliberation helps ensure that a participant's subjective preferences are formed in the light of important facts and the private and public values that are intertwined with their interpretation. In a discursively representative deliberative forum, discourses representing the interests of non-human nature, future generations, communicatively-limited humans, and distant but affected parties may be aired, challenging parochialism in preference formation [37,98]. Given that many decisions have dimensions that extend beyond the bounds of a traditional polity, discursive representation can provide deliberation with the more cosmopolitan framing that it may merit. Discursive representation, combined with a commitment to listening and learning, provide deliberative pre-conditions that help ensure that relevant environmental claims are expressed and considered (given "voice") in preference formation.

4.2. Deliberation and Normative Evaluation

Deliberation in its more radical, critical theory sense departs from the premise that normative claims can and should be evaluated or ranked, so as to enable legitimation and social critique. It is not simply that personal preferences are shaped through communication, but also that the process itself can allow for normative evaluation (i.e. social choice) through public reasoning, or the giving and scrutinizing of claims. In this sense, participants in a deliberative process may inter-subjectively (via communication) agree to an ordering of claims (i.e., A is preferable to B), achieving partial or complete consensus on a social choice. Baber and Bartlett [40] delimit three camps of such normative evaluation: the "full liberalism" of Amy Gutmann, Dennis Thompson, and James Bohman; the mandatory discourse of Habermas; and, the normative pre-commitments of Rawls. To this we add a fourth: the evaluative "public reasoning" of Amartya Sen (Figure 2).

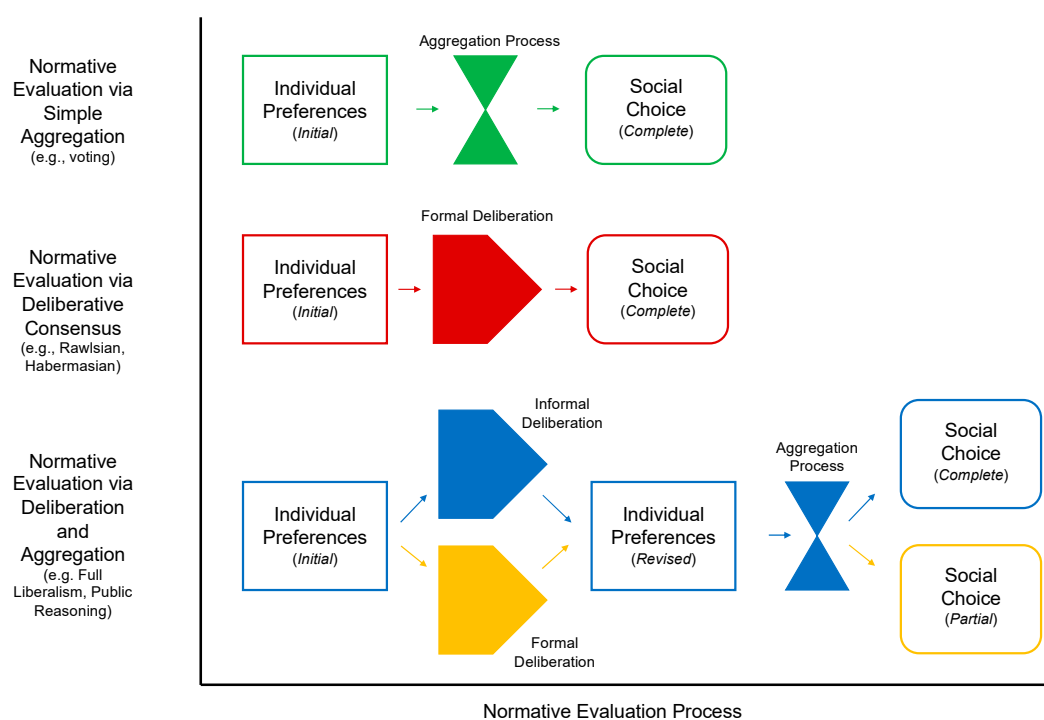


Figure 2. Normative evaluation and social choice: aggregative and deliberative models. Simple voting and aggregative procedures do not lead to changes in preferences. Deliberative processes aim to change preferences, leading to consensus or, via aggregation, a complete or partial social choice.

The full liberalism strand of deliberative theory aims to set the preconditions for public deliberation, without any particular constraints on the types of reasons that are given. In other words, while the requirements for a “legitimate” deliberative setting are quite strict, helping to remedy fundamental injustices with social arrangements and standing, once deliberation begins there are few restrictions about what happens and the resulting outcomes. Hence both particular and general claims are allowed, consensus is not mandated, and aggregative procedures can be used. The aim is a fair process and an enriched debate that will, hopefully, help solve collective problems, at least temporarily [40].

Similarly, Rawls [40] sees the point of deliberation as limited to establishing “just institutions” within which individuals can pursue their personal interests. In this sense, deliberative consensus should be achieved on the basis of “public reasons,” which are reasons that all are willing to ascribe to—in this sense, any particular individual claims are excluded from deliberation. This more transcendental or idealist approach to deliberation and justice is of limited usefulness for making everyday decisions and navigating actually existing questions of injustice, but may serve constitutive purposes [87].

Slightly less exacting is the theory of Jurgen Habermas [35,36], where deliberation can admit a broader array of topics, yet is still intended to address matters of common concern. The goal remains consensus via a process that explicitly aims to evaluate general normative claims, discarding those that cannot be deemed communicatively or inter-subjectively rational. Rationality is found in mutual acceptance of the validity claims of speech or discourse; validity claims pertain to matters of empirical (mind external) fact as well as normative subjects such as moral rightness, aesthetic value, and so on. This mutual acceptance of normative claims relies in part on a shared lifeworld of the subjects of communication. The broader goal of deliberation is to establish normative legitimacy that can be used to critique and therefore reshape society. The conditions Habermas sets for deliberation are strict, representing a practical ideal perhaps more than a workable model.

Sen establishes a middle ground between the “full liberalism” and Habermasian models, in that he sees deliberation as necessary to the evaluation of normative claims yet allows for aggregation (rather than strict consensus) to determine the evaluative outcome [87]. In acknowledging the deeply pluralistic nature of human society, he accepts that in many cases the results of deliberation followed by aggregation may yield only a partial ordering of normative claims (“we agree that B is manifestly unfair and should be stopped, yet we cannot determine whether A or C is better”) (ibid.). This aggregative approach demands evaluation via deliberation but does not demand agreement on the reasons for the ranking, something Habermas might demand in determining the rationality of validity claims. In this sense, Sen hews closely to Sunstein [99] on the acceptability of “incompletely theorized agreements.”

Deliberation as a means for normative evaluation opens up space for consideration of an array of moral, ethical, and aesthetic claims that may, in non-deliberative settings, be obscured by power structures advancing instrumental claims. It demands that claims be evaluated publicly, potentially privileging those that appeal to the general interest rather than the particular. As Dryzek [100] (p. 204) argues: “. . . the human life-support capacity of natural systems is the generalizable interest par excellence,” so environmental claims may receive more weight in deliberative decisions, whether via aggregation or consensus under more or less strict conditions. It is harder to sustain a claim in favor of your own particular interests in a public forum constituted of those who would potentially bear the costs of such a claim. This is the constraint that Sen [81] imposes on his form of “development as freedom”—an individual can pursue their own interests only insofar that they can be publicly justified. In this sense, utilitarian calculation takes place in the agora of public assembly rather than the agora of the marketplace.

4.3. Deliberation and Legitimation

The connection between deliberation and the discourse of modernity lies most clearly in the notion of legitimation, the process whereby a course of action or discourse gains legitimacy. Legitimacy can

be understood as occurring when something “is accepted as proper by those to whom it is supposed to apply” and is an essential aspect of democratic governance [97] (p. 21). Deliberation can be viewed as a legitimation process, in that deliberation seeks to construct among the participants a shared understanding of the issues at hand and some agreement—full or partial—on the facts, preferences, and norms that are at play and their relative importance and validity. Deliberative legitimacy in an ideal sense demands the free and willing participation of all those affected by a decision, the recognition of deliberative capacities in others, and some alignment between the decision made as a result of deliberation and the corresponding actions taken [38]. This ideal form raises complicated questions about representation and scale, including the ability to deliberate about decisions that affect large groups of people, non-human nature, or those lacking deliberative capacity [97,101].

In the strictest sense, legitimacy derives from the achievement of reasoned consensus on issues of general concern. Particular interests can be pursued on the basis of instrumental rationality and hence do not demand deliberation. In this sense, Rawls distinguishes between claims that are rational and those that are reasonable [102]. It may be rational for a hungry individual to eat all the food in the communal bowl, but if they are part of a community of hungry people this behavior may not be deemed reasonable according to shared moral and ethical standards. For Habermas, reasonableness emerges through the intersubjective renewing of validity claims via communication. In a less strict sense, deliberation can be understood as the process of forming a shared understanding of the rational, the reasonable, and their relationship in a given context [103].

This legitimation function of deliberation has the potential to both support and give rise to a sustainability transition. Insofar as environmental concerns are privileged in deliberation, the legitimacy-conferring capacity of deliberation can potentially render decisions more stable, heading off conflict and contestation that might otherwise arise if the same decision were made after a less legitimate procedure. This is further enhanced by the goal of achieving decisions that are reasonable, rather than simply (instrumentally) rational. The deeply democratic intent of deliberative processes may confer longevity and engender skills and attitudes among participants that are, for lack of a better term, pro-social. In fact, a central goal of deliberative processes is to maintain the willingness of participants to continue deliberating [38]. In this sense, deliberation can in itself create deliberants who hold the democratic and socially-oriented citizen preferences (potentially) necessary for a sustainability transition [41].

4.4. Deliberative Systems for Sustainability: Reinvigorating the Public Sphere

Deliberative social and political theory fundamentally breaks with the subjective model of reason characteristic of modern thought. In locating reason in the intersubjective, there is acknowledgement that the fixed and unquestioned “subjective preferences” of individuals are in fact socially constructed, malleable, and subject to normative evaluation. This has parallels in ecological economics, where similar arguments mark a break with neoclassical theory and the idea of the impossibility of intersubjective utility comparisons. Deliberative political theory marks a break with democracy conceived as passive preference aggregation and a potential escape from some paradoxes of social choice by voting [104]. In critical theory it marks a break with postmodernism, “rescuing” the critical project by locating a quasi-universal basis for a normative critique of society [29]. In the most radical interpretation, deliberation can be constitutive of social transformation, in that deliberation reinvigorates the public sphere, allowing for the emergence of a collective critique of society that provides the basis for legitimate, transformative collective action.

The shared basis for critique is, in most interpretations, constrained by the bounds of the group taking part in deliberation. This begs the question of “mini-publics and their macro consequences” [97] (p. 155). How can deliberative processes, which under most designs involves tens to hundreds of people, scale up to a deliberative system? As [39] (p. 1) note, “no single forum, however ideally constituted, could possess deliberative capacity sufficient to legitimate most of the decisions and policies democracies adopt.” Given that many environmental and social concerns span multiple

scales and levels, this question evades easy answer. At the level of the nation-state, the issue of representation and scale has been addressed by acknowledging that deliberation can (and should) happen at multiple sites, including traditional political venues. This risks privileging existing sources of power (experts, legislatures, interest groups) that can mobilize deliberative capacity or otherwise dominate the system [39]. In this sense, there is a risk that a call for deliberation and participation can, in fact, reinforce (and even emanate from) technocratic and elite discourses [19].

Although the nation-state remains the principal vehicle for converting public opinion into administrative power, the importance of networked governance, transcending the “demos” of the nation-state, has been widely recognized [32,97]. This complicates the process of turning deliberative outcomes into administrative power. Networked governance may provide a vehicle for achieving the cosmopolitan vision of some deliberative democrats, in that networks can build deliberative capacity and processes that span traditional polities. But networked governance can exist in elite spaces that are hard to hold accountable via traditional democratic politics. Dryzek [97] suggests that governance networks can be analyzed in light of the standards of deliberative democracy (i.e., non-domination/non-coerciveness, reciprocity), helping identify deliberative democratic deficits.

Given that many of the sustainability challenges documented by ecological economists and others are regional or even global in scope, a deliberative approach to governance demands consideration of how micro-level deliberative processes can work in a larger deliberative system [105]. The deliberative functions and potential positive feedbacks for a sustainability transition can be viewed as operating at two interacting levels that cannot be viewed in isolation [106]. First, they serve a micro (political) function, helping clarify interests and evaluate claims in support of better decision-making. Second, they serve a macro (social) function, cultivating pro-social behavior and democratic norms that may help invigorate the public sphere. The micro-processes (designed or otherwise) will take place within (and constitute) a broader macro-system that can directly affect the success of turning micro-scale deliberation into meaningful social outcomes.

The fundamental challenge for normative transdisciplines such as ecological economics is legitimating normative claims so as to turn analysis and critique into social action. A sustainability transition involves motivating a collective response to decades of scientific warnings about the status of the planet’s life-support systems. If one accepts the deliberative premise, this process of legitimation can happen via deliberation amongst the parties (or their representatives) affected by a given decision or concern. Translating the outcomes of legitimate deliberation into social action is the crux of praxis. Yet given the complex, interconnected nature of many environmental problems, it is not conceivable under present-day political circumstances that a unique process of deliberation be arranged to address each and every collective decision.

Habermas points to a potential solution in a radicalized (or reinvigorated) public sphere [36,107]. The public sphere is a space of un-coerced deliberation about collective problems and the general interests that pertain in solving them; it is the space where social critique can be formed and gain legitimacy. Habermas does not see the public sphere as necessarily existing in any physical space or institution, but rather consisting of an inclusive process of communication that takes place in multiple locales and media, generating a form of public opinion that can challenge, critique, and ultimately shape the functioning of the political-economic superstructure [107]. Hence the micro-processes of deliberation—including those adapted by ecological economists—may both demand and cultivate the behaviors and social norms conducive to a thriving public sphere. Insofar as deliberative processes demand and seek to promote inclusivity, reciprocity, open-mindedness, and public-mindedness (among other conditions), they may become “value-articulating institutions” [108] that actually cultivate the types of deliberants conducive to a sustainability transition [109]. In this capacity, the purported link between pro-social norms and pro-environmental behavior merits further exploration [110,111]. The question becomes whether norms cultivated through micro-scale processes have the capacity to trigger a “norm cascade” that leads to their broader acceptance in society [112]. In this sense, despite a daunting plurality of views, the expansion of deliberative processes could

help create shared norms that can become sufficient for normative evaluation at a supra-national (“quasi-universal”) level.

5. A Deeply Democratic Sustainability Transition: Some Open Questions

The allegedly utopian promises of deliberative theory, combined with the strict conditions imposed by some of the earlier advocates (e.g., Habermas’s Ideal Speech Act) have opened deliberative theory to extensive critique, especially with regard to the design of deliberative processes. The major criticisms have been well explored in other work, for example: the problems of scale and representation [39,97]; concerns about inequality and suppression of rhetoric and other forms of subaltern politics [37]; problems of legitimacy [101]; and problematic participants [40]. The response has been to introduce different forms of representation, allow for aggregation, permit forms of speech that violate the stricter standards of communicative rationality, and generally accommodate the ideal forms of deliberation to the complex realities of political life. The risk is that accommodation reproduces the status quo.

In scaling up from the individual deliberative process to the broader deliberative system, questions abound about the limits of the deliberative model. Deliberative democracy is, in many ways, a revolutionary normative theory of democracy, in that it specifies a set of conditions that when realized constitute an authentically deliberative process [113]. While Habermas locates the root of deliberative legitimacy in quasi-universal speech processes, there is no law that existing power structures acquiesce to claims emanating from the public sphere, never mind actively strive to support deliberative governance. Even in nominal democracies, the notion that an individual can have little impact on the superstructure can create a collective action problem discouraging deliberative engagement [40]. Likewise, deliberative processes at the global scale may be conducted by elites with little legitimacy in the eyes of the governed. Dryzek [97] points to some potential for deliberation within authoritarian states, yet the development of a truly global, vibrant public sphere may be constrained by the profound lack of democracy in many parts of the world. It may be the case that contentious politics—perhaps aided by deliberation—is needed to create the opening for deliberative democracy to spread to the more authoritarian corners of the world.

Within (and beyond) liberal democracies, group polarization stands as an important threat to the functioning of the public sphere [114]. Group polarization tends to occur in deliberation amongst like-minded groups, where the result is to drive decisions “to extremes” rather than toward the center (*ibid*). This challenge has been answered with design solutions, for example using random deliberant selection or “discursive representation” to avoid homogeneity in formal deliberative settings [41,97]. This solution begs the question of who designs the process, important in its own right. But group polarization is more problematic in the public sphere writ large. For example, there is increasing evidence that the changing media and communications landscape is allowing people to self-segregate into groups that are likeminded, meaning that deliberation in the public sphere may in fact exhibit polarization tendencies [115]. This may be compounded by actual physical segregation along ideological lines, although the evidence on partisan sorting, at least in the United States, is mixed [116]. The potential for deliberative processes to support a reinvigoration of the public sphere conducive to a sustainability transition is subject to changing social conditions.

The actual conditions (including capability deprivations) facing many people around the world may constitute a barrier to participation in a vibrant public sphere. In terms of deliberative capacity, we do not refer to the ability of deliberants to communicate (i.e., we set aside questions about non-human nature, the disabled, future generations, etc.), nor the particular structures of a political system that enable deliberation to function [97]. We refer rather to achievement of the broader development conditions (or “minimum capabilities”) conducive to active participation in a vibrant public sphere, regardless of political context. In this vein, Nussbaum [82] has proposed a minimum set of capabilities based on a conception of a good human life (“*eudemonia*”) and the idea of humans as fundamentally social beings [84]. It is not so much that these are preconditions for deliberation but instead constitute a

minimum standard of development that may be needed to sustain a deliberative system. These claims merit investigation, but clearly the conversion of deliberative agreement into administrative action is challenging in the context of a failed state, deep authoritarianism, or famine conditions. To respect Sen's view that capabilities be determined solely through public reasoning, one could envision a structured, global deliberative process to specify a set of "minimum" universal capabilities, similar to global norm formation as advanced by Baber and Bartlett [41]. For ecological economists, the challenge then becomes identifying efficient, fair, and legitimate means to provide the minimum capabilities while remaining within planetary boundaries.

Beyond the various barriers to a global, vibrant public sphere, deliberative scholars must also respond to concerns relevant to a sustainability transition. Deliberative processes are designed to foster slow, careful reasoning and to provide space for the airing of many views. Yet the ecological crises motivating many normative transdisciplines are perceived as urgent, demanding immediate, major action. For example, it remains unclear whether a deliberative system is capable of generating the course correction needed to avoid the effects of transgressing critical ecological thresholds [117]. As Baber and Bartlett [40] (p. 203) note, "markets, legal systems, bureaucracies, and other political institutions of all kinds have imperialistic tendencies, resist deliberative innovation, and are vested in the status quo." While deliberation may have the capacity to counter this, the process may be slow. The promise of greater legitimacy may help create durable decisions, weakening or undermining resistance borne of exclusion or a perceived lack of representation. At the expense of rapid decision-making, deliberation may provide more decisive decisions. Legitimation may even confer strength to counter-hegemonic discourses. Yet when faced with hard choices, it is unclear that the reasoned or consensus decision will be sufficient. As Deriu [31] (p. 556) succinctly puts it: "... the paradox of democratic freedom is that ... we are called on to use our own freedom to affirm the limits to that very freedom in the most radical way."

Finally, there are open questions about the feasibility of representing deeply ecocentric discourses in deliberation. Deliberative theory has multiple points of origin, and in the problem-solving sense, all build on an arguably liberal humanist foundation. Deliberation seeks to respect and preserve the freedom and autonomy of the individual human, recognizing that each human exists within a pluralistic society lacking normative consensus. The procedural norm of deliberation trumps any particular "comprehensive doctrine," to use Rawlsian terminology. This privileging of individuals engaging in procedure appears to be—and is often formulated as—an anthropocentric orientation for deliberative democracy [118].

In the interest of a sustainability transition, the question remains whether deliberative theory can support a more ecocentric orientation (assuming such a thing is necessary) [98,119]. In line with Dryzek's [97] notion of "discursive representation" as the basis for legitimacy in deliberation, Eckersley [98] notes that the interests and perspectives of non-humans may deserve representation even if they are not actually the concern of any individuals party to the deliberation. As described earlier, deliberation may privilege normative claims that invoke the general interest, which could include recognition of the rights of other species, future generations, or reparation of past injustices. The social liberal approach leaves room for ecocentric values to emerge, but does not require them [120,121].

6. Conclusions

The challenge for any normative transdisciplinary science, such as ecological economics, is accepting that scientists' normative claims can only be socially legitimated in a deeply democratic, unpredictable and open-ended process. Rigorous, peer-reviewed analysis that appears to indicate an impending crisis may, despite demands to "act with urgency," yield little in the way of immediate or coordinated response. Deliberation in its problem-solving mode can help improve environmental decision-making and, in a more abstract sense, ground alternative theories of development. This role for deliberation has been embraced and developed within ecological economics. Yet the more radical promise of deliberative systems as catalyst for social-ecological transformation remains at the level of

untested theory. Much work remains to link micro-level deliberative processes with the macro-effects necessary for a deeply democratic and legitimate sustainability transformation.

Author Contributions: The paper was conceived and led by M.B.W. and revised and refined through collaborative writing and editing with R.V.B. and J.D.E.

Funding: General funding was provided to M. Wironen by the Social Sciences and Humanities Research Council of Canada, the Gund Institute for Environment, and the Robert & Patricia Switzer Foundation.

Acknowledgments: The authors would like to thank Peter Brown, Josh Farley, and Sam Bliss for helpful comments on earlier versions of the manuscript.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Soulé, M.E. What Is Conservation Biology? *Bioscience* **1985**, *35*, 727–734.
2. Gowdy, J.; Erickson, J.D. The approach of ecological economics. *Camb. J. Econ.* **2005**, *29*, 207–222. [[CrossRef](#)]
3. Kates, R.W.; Clark, W.C.; Corell, R.; Hall, J.M.; Jaeger, C.C.; Lowe, I.; McCarthy, J.J.; Schellnhuber, H.J.; Bolin, B.; Dickson, N.M.; et al. Sustainability science. *Science (80-.)* **2001**, *292*, 641–642. [[CrossRef](#)]
4. Méndez, V.E.; Bacon, C.M.; Cohen, R. Agroecology as a Transdisciplinary, Participatory, and Action-Oriented Approach. *Agroecol. Sustain. Food Syst.* **2013**, *37*, 3–18.
5. Robbins, P. *Political Ecology: A Critical Introduction*, 2nd ed.; Wiley-Blackwell: Chichester, UK, 2012; ISBN 978-0470657324.
6. Alvesson, M.; Skoldberg, K. *Reflexive Methodology: New Vistas for Qualitative Research*, 1st ed.; SAGE Publications: London, UK, 2000; ISBN 0-8039-7707-7.
7. Lackey, R.T. Science, scientists, and policy advocacy. *Conserv. Biol.* **2007**, *21*, 12–17. [[CrossRef](#)] [[PubMed](#)]
8. Cooke, M. Avoiding authoritarianism: On the problem of justification in contemporary critical social theory. *Int. J. Philos. Stud.* **2005**, *13*, 379–404. [[CrossRef](#)]
9. Daly, H. The Economics of the steady state. *Am. Econ. Rev.* **1974**, *64*, 15–21.
10. Kallis, G.; Kerschner, C.; Martinez-Alier, J. The economics of degrowth. *Ecol. Econ.* **2012**, *84*, 172–180. [[CrossRef](#)]
11. Georgescu-Roegen, N. *The Entropy Law and the Economic Process*; Harvard University Press: Cambridge, MA, USA, 1971.
12. Jackson, T. *Prosperity Without Growth: Economics for a Finite Planet*; Earthscan-Routledge: New York, NY, USA, 2009; ISBN 978-1849713238.
13. Daly, H.E. *Economics, Ecology, Ethics: Essays Toward a Steady-State Economy*; WH Freeman: San Francisco, CA, USA, 1980; ISBN 0716711796.
14. Costanza, R.; Alperovitz, G.; Daly, H.; Farley, J.; Franco, C.; Jackson, T.; Kubiszewski, I.; Schor, J.; Victor, P. *Building a Sustainable and Desirable Economy-in-Society-in-Nature*; The Division for Sustainable Development of the United Nations Department of Economic and Social Affairs: New York, NY, USA, 2012.
15. Söderbaum, P. Values, ideology and politics in ecological economics. *Ecol. Econ.* **1999**, *28*, 161–170. [[CrossRef](#)]
16. Daly, H.E. Allocation, distribution, and scale: Towards an economics that is efficient, just, and sustainable. *Ecol. Econ.* **1992**, *6*, 185–193. [[CrossRef](#)]
17. Milonakis, D.; Fine, B. *From Political Economy to Economics: Method, the Social, and the Historical and in the Evolution of Economic Theory*; Routledge: New York, NY, USA, 2009; ISBN 978-0-415-42322-9.
18. Daly, H.E.; Farley, J. *Ecological Economics: Principles and Applications*, 2nd ed.; Island Press: Washington, DC, USA, 2010; ISBN 9781597266819.
19. Hendriks, C.M. Policy design without democracy? Making democratic sense of transition management. *Policy Sci.* **2009**, *42*, 341–368. [[CrossRef](#)]
20. Irwin, A. The Politics of Talk: Coming to Terms with the ‘New’ Scientific Governance. *Soc. Stud. Sci.* **2006**, *36*, 299–320. [[CrossRef](#)]
21. Wynne, B. Public Participation in Science and Technology: Performing and Obscuring a Political—Conceptual Category Mistake. *East Asian Sci. Technol. Soc.* **2007**, *1*, 99–110.
22. Habermas, J.; Ben-Habib, S. Modernity versus Postmodernity. *New Ger. Crit.* **1981**, *22*, 3–14. [[CrossRef](#)]
23. Callinicos, A. *Social Theory: A Historical Introduction*; Polity: Cambridge, UK, 2007; ISBN 0745638392.

24. Asafu-Adjaye, J.; Blomqvist, L.; Brand, S.; Brook, B.; Defries, R.; Ellis, E.; Foreman, C.; Keith, D.; Lewis, M.; Lynas, M.; et al. An Ecomodernist Manifesto. Available online: <http://www.ecomodernism.org/> (accessed on 7 February 2019).
25. Putnam, H. *The Collapse of the Fact/Value Dichotomy and Other Essays*; Harvard University Press: Cambridge, MA, USA, 2002; ISBN 978-0674013803.
26. Robbins, L. *An Essay on the Nature and Significance of Economic Science*; Macmillan & Co., Limited: London, UK, 1932.
27. Horkheimer, M.; Adorno, T.W. *Dialectic of Enlightenment*; Noerr, G.S., Ed.; Stanford University Press: Palo Alto, CA, USA, 2002; ISBN 9780804736336.
28. Lyotard, J.-F. *The Postmodern Condition: A Report on Knowledge*; University of Minnesota Press: Minneapolis, MN, USA, 1984; ISBN 0-8166-1173-4.
29. Habermas, J. *The Philosophical Discourse of Modernity: Twelve Lectures*; MIT Press: Cambridge, MA, USA, 1990; ISBN 9780262581028.
30. Fergus, A.H.T.; Rowney, J.I.A. Sustainable development: Lost meaning and opportunity? *J. Bus. Ethics* **2005**, *60*, 17–27. [[CrossRef](#)]
31. Deriu, M. Democracies with a future: Degrowth and the democratic tradition. *Futures* **2012**, *44*, 553–561. [[CrossRef](#)]
32. Biermann, F.; Pattberg, P. *Global Environmental Governance Reconsidered*; MIT Press: Cambridge, MA, USA, 2012.
33. Swyngedouw, E. Globalisation or “glocalisation”? Networks, territories and rescaling. *Camb. Rev. Int. Aff.* **2004**, *17*, 25–48. [[CrossRef](#)]
34. Cash, D.W.; Adger, W.N.; Berkes, F.; Garden, P.; Lebel, L.; Olsson, P.; Pritchard, L.; Young, O. Scale and Cross-Scale Dynamics: Governance and Information in a Multilevel World. *Ecol. Soc.* **2006**, *11*, 8. [[CrossRef](#)]
35. Habermas, J. *The Theory of Communicative Action Volume 1: Reason and the Rationalization of Society*; Beacon Press: Boston, MA, USA, 1987; ISBN 9780807015070.
36. Habermas, J. *The Theory of Communicative Action Volume 2: Lifeworld and System: A Critique of Functionalist Reason*; Beacon Press: Boston, MA, USA, 1987; ISBN 0-8070-1401-X.
37. Dryzek, J.S. *Deliberative Democracy and Beyond*; Oxford University Press: Oxford, UK, 2002; ISBN 9780199250431.
38. Cohen, J. Deliberation and Democratic Legitimacy. In *The Good Polity: Normative Analysis of the State*; Hamlin, A., Petit, P., Eds.; Blackwell: New York, NY, USA, 1989; pp. 17–34.
39. Parkinson, J.; Mansbridge, J. *Deliberative Systems: Deliberative Democracy at the Large Scale*; Cambridge University Press: Cambridge, MA, USA, 2012.
40. Baber, W.F.; Bartlett, R.V. *Deliberative Environmental Politics*; MIT Press: Cambridge, MA, USA, 2005; ISBN 9780262025874.
41. Baber, W.F.; Bartlett, R.V. *Consensus and Global Environmental Governance*; MIT Press: Cambridge, MA, USA, 2015; ISBN 9780262028738.
42. Zografos, C.; Howarth, R.B. Introduction: Towards a Deliberative Ecological Economics. In *Deliberative Ecological Economics*; Zografos, C., Howarth, R.B., Eds.; Oxford University Press: New Delhi, India, 2008; pp. 1–22. ISBN 978-0-19-569697-4.
43. Cox, R.W. Social Forces, States and World Orders: Beyond International Relations Theory. *Millenn.-J. Int. Stud.* **1981**, *10*, 126–155. [[CrossRef](#)]
44. Goodin, R.E. *Green Political Theory*; Polity: Cambridge, MA, USA, 1992.
45. Sagoff, M. *The Economy of the Earth: Philosophy, Law, and the Environment*, 1st ed.; Cambridge University Press: New York, NY, USA, 1988.
46. Gregory, R.; Lichtenstein, S.; Slovic, P. Valuing environmental resources: A constructive approach. *J. Risk Uncertain.* **1993**, *7*, 177–197. [[CrossRef](#)]
47. Ackerman, F.; Heinzerling, L. Pricing the priceless: Cost-benefit analysis of environmental protection. *Univ. PA Law Rev.* **2002**, *150*, 1553–1584. [[CrossRef](#)]
48. Gowdy, J.M. Toward an experimental foundation for benefit-cost analysis. *Ecol. Econ.* **2007**, *63*, 649–655. [[CrossRef](#)]
49. Martinez-Alier, J.; Munda, G.; O’Neill, J. Weak comparability of values as a foundation for ecological economics. *Ecol. Econ.* **1998**, *26*, 277–286. [[CrossRef](#)]

50. Aldred, J. Incommensurability and Monetary Valuation. *Land Econ.* **2006**, *82*, 141–161. [[CrossRef](#)]
51. Spash, C.L. Deliberative monetary valuation (DMV): Issues in combining economic and political processes to value environmental change. *Ecol. Econ.* **2007**, *63*, 690–699. [[CrossRef](#)]
52. Bromley, D.W. The ideology of efficiency: Searching for a theory of policy analysis. *J. Environ. Econ. Manag.* **1990**, *19*, 86–107. [[CrossRef](#)]
53. Nyborg, K. Project evaluation with democratic decision-making: What does cost-benefit analysis really measure? *Ecol. Econ.* **2014**, *106*, 124–131. [[CrossRef](#)]
54. O'Neill, J. Representing people, representing nature, representing the world. *Environ. Plan. C Gov. Policy* **2001**, *19*, 483–500. [[CrossRef](#)]
55. Sagoff, M. Aggregation and deliberation in valuing environmental public goods: A look beyond contingent pricing. *Ecol. Econ.* **1998**, *24*, 213–230. [[CrossRef](#)]
56. Stoeckl, N.; Hicks, C.; Farr, M.; Grainger, D.; Esparon, M.; Thomas, J.; Larson, S. The Crowding Out of Complex Social Goods. *Ecol. Econ.* **2018**, *144*, 65–72. [[CrossRef](#)]
57. Parks, S.; Gowdy, J. What have economists learned about valuing nature? A review essay. *Ecosyst. Serv.* **2013**, *3*, e1–e10. [[CrossRef](#)]
58. Wilson, M.A.; Howarth, R.B. Discourse-based valuation of ecosystem services: Establishing fair outcomes through group deliberation. *Ecol. Econ.* **2002**, *41*, 431–443. [[CrossRef](#)]
59. Lo, A.Y.; Spash, C.L. Deliberative monetary valuation: In search of a democratic and value plural approach to environmental policy. *J. Econ. Surv.* **2013**, *27*, 768–789. [[CrossRef](#)]
60. Kenter, J.O.; Bryce, R.; Christie, M.; Cooper, N.; Hockley, N.; Irvine, K.N.; Fazey, I.; O'Brien, L.; Orchard-Webb, J.; Ravenscroft, N.; et al. Shared values and deliberative valuation: Future directions. *Ecosyst. Serv.* **2016**, *21*, 358–371. [[CrossRef](#)]
61. Bartkowski, B.; Lienhoop, N. Beyond Rationality, Towards Reasonableness: Enriching the Theoretical Foundation of Deliberative Monetary Valuation. *Ecol. Econ.* **2018**, *143*, 97–104. [[CrossRef](#)]
62. Hermans, C.; Howarth, R.B.; Noordewier, T.; Erickson, J.D. Constructing Preferences in Structured Group Deliberative Processes. In *Deliberative Ecological Economics*; Oxford University Press: Oxford, UK, 2008; pp. 50–79.
63. Ayres, R.; van den Bergh, J.; Gowdy, J. Strong versus Weak Sustainability. *Environ. Ethics* **2001**, *23*, 155–168. [[CrossRef](#)]
64. Temper, L.; Martinez-Alier, J. The god of the mountain and Godavarman: Net Present Value, indigenous territorial rights and sacredness in a bauxite mining conflict in India. *Ecol. Econ.* **2013**, *96*, 79–87. [[CrossRef](#)]
65. Ananda, J.; Herath, G. A critical review of multi-criteria decision making methods with special reference to forest management and planning. *Ecol. Econ.* **2009**, *68*, 2535–2548. [[CrossRef](#)]
66. Rauschmayer, F.; Wittmer, H. Evaluating deliberative and analytical methods for the resolution of environmental conflicts. *Land Use Policy* **2006**, *23*, 108–122. [[CrossRef](#)]
67. Hermans, C.; Erickson, J.; Noordewier, T.; Sheldon, A.; Kline, M. Collaborative environmental planning in river management: An application of multicriteria decision analysis in the White River Watershed in Vermont. *J. Environ. Manag.* **2007**, *84*, 534–546. [[CrossRef](#)]
68. Munda, G.; Nijkamp, P.; Rietveld, P. Qualitative multicriteria evaluation for environmental management. *Ecol. Econ.* **1994**, *10*, 97–112. [[CrossRef](#)]
69. Gregory, R.; Failing, L.; Harstone, M.; Long, G.; McDaniels, T.; Ohlson, D. *Structured Decision Making: A Practical Guide to Environmental Management Choices*; Wiley-Blackwell: Chichester, UK, 2012; ISBN 978-1-4443-3342-8.
70. O'Hara, S.U. Discursive ethics in ecosystems valuation and environmental policy. *Ecol. Econ.* **1996**, *16*, 95–107. [[CrossRef](#)]
71. Funtowicz, S.O.; Ravetz, J.R. The worth of a songbird: Ecological economics as a post-normal science. *Ecol. Econ.* **1994**, *10*, 197–207. [[CrossRef](#)]
72. Failing, L.; Gregory, R.; Harstone, M. Integrating science and local knowledge in environmental risk management: A decision-focused approach. *Ecol. Econ.* **2007**, *64*, 47–60. [[CrossRef](#)]
73. Georgescu-Roegen, N. Energy and Economic Myths. *South. Econ. J.* **1975**, *41*, 347. [[CrossRef](#)]
74. Lawn, P.A. A theoretical foundation to support the Index of Sustainable Economic Welfare (ISEW), Genuine Progress Indicator (GPI), and other related indexes. *Ecol. Econ.* **2003**, *44*, 105–118. [[CrossRef](#)]

75. Max-Neef, M. Economic growth and quality of life: A threshold hypothesis. *Ecol. Econ.* **1995**, *15*, 115–118. [[CrossRef](#)]
76. Lehtonen, M. The environmental–social interface of sustainable development: Capabilities, social capital, institutions. *Ecol. Econ.* **2004**, *49*, 199–214. [[CrossRef](#)]
77. Sneddon, C.; Howarth, R.B.; Norgaard, R.B. Sustainable development in a post-Brundtland world. *Ecol. Econ.* **2006**, *57*, 253–268. [[CrossRef](#)]
78. Dearing, J.A.; Wang, R.; Zhang, K.; Dyke, J.G.; Haberl, H.; Hossain, M.S.; Langdon, P.G.; Lenton, T.M.; Raworth, K.; Brown, S.; et al. Safe and just operating spaces for regional social-ecological systems. *Glob. Environ. Chang.* **2014**, *28*, 227–238. [[CrossRef](#)]
79. Lamberton, G. Sustainable sufficiency—An internally consistent version of sustainability. *Sustain. Dev.* **2005**, *13*, 53–68. [[CrossRef](#)]
80. Max-Neef, M. *Huma Scale Development*; Apex Press: New York, NY, USA, 1991.
81. Sen, A.K. *Development as Freedom*; Oxford University Press: Oxford, UK, 1999; ISBN 978-0-19-289330-7.
82. Nussbaum, M.C. *Woman and Human Development: The Capabilities Approach*; Cambridge University Press: Cambridge, UK, 2000.
83. Sen, A.K. Human Rights and Capabilities. *J. Hum. Dev.* **2005**, *6*, 151–166. [[CrossRef](#)]
84. Muraca, B. Towards a fair degrowth-society: Justice and the right to a “good life” beyond growth. *Futures* **2012**, *44*, 535–545. [[CrossRef](#)]
85. Polishchuk, Y.; Rauschmayer, F. Beyond “benefits”? Looking at ecosystem services through the capability approach. *Ecol. Econ.* **2012**, *81*, 103–111. [[CrossRef](#)]
86. Rauschmayer, F.; Leßmann, O. Assets and drawbacks of the CA as a foundation for sustainability economics. *Ecol. Econ.* **2011**, *70*, 1835–1836. [[CrossRef](#)]
87. Sen, A.K. *The Idea of Justice*; Belknap Press: Cambridge, MA, USA, 2009; ISBN 9780674036130.
88. Sen, A.K. Democracy as a Universal Value. *J. Democr.* **1999**, *10*, 3–17. [[CrossRef](#)]
89. Scerri, A. Erratum to “Ends in view: The capabilities approach in ecological/sustainability economics” [*Ecol Econ* 77 (2012) 7–10]. *Ecol. Econ.* **2012**, *82*, 139. [[CrossRef](#)]
90. Lessmann, O.; Rauschmayer, F. Re-conceptualizing Sustainable Development on the Basis of the Capability Approach: A Model and Its Difficulties. *J. Hum. Dev. Capab.* **2013**, *14*, 95–114. [[CrossRef](#)]
91. Pelenc, J.; Ballet, J. Strong sustainability, critical natural capital and the capability approach. *Ecol. Econ.* **2015**, *112*, 36–44. [[CrossRef](#)]
92. Griewald, Y.; Rauschmayer, F. Exploring an environmental conflict from a capability perspective. *Ecol. Econ.* **2014**, *100*, 30–39. [[CrossRef](#)]
93. Gutwald, R.; Leßmann, O.; Masson, T.; Rauschmayer, F. A Capability Approach to Intergenerational Justice? Examining the Potential of Amartya Sen’s Ethics with Regard to Intergenerational Issues A Capability Approach to Intergenerational Justice? Examining the Potential of Amartya Sen’s Ethics with Rega. *J. Hum. Dev. Capab.* **2014**, 2829. [[CrossRef](#)]
94. Rauschmayer, F.; Bauler, T.; Schöpke, N. Towards a thick understanding of sustainability transitions—Linking transition management, capabilities and social practices. *Ecol. Econ.* **2015**, *109*, 211–221. [[CrossRef](#)]
95. Howarth, R.B. Towards an operational sustainability criterion. *Ecol. Econ.* **2007**, *63*, 656–663. [[CrossRef](#)]
96. Dodds, S. Towards a “science of sustainability”: Improving the way ecological economics understands human well-being. *Ecol. Econ.* **1997**, *23*, 95–111. [[CrossRef](#)]
97. Dryzek, J.S. *Foundations and Frontiers of Deliberative Governance*; Oxford University Press: Oxford, UK, 2010; ISBN 978-0-19-956294-7.
98. Eckersley, R. Environmental pragmatism, ecocentrism and deliberative democracy: Between problem-solving and fundamental critique. In *Democracy and the Claims of Nature*; Pepperman Taylor, B., Minter, B., Eds.; Rowman and Littlefield Publishers, Inc.: Lanham, MD, USA, 2002.
99. Sunstein, C.R. Incompletely Theorized Agreements. *Harv. Law Rev.* **1995**, *108*, 1733. [[CrossRef](#)]
100. Dryzek, J.S. *Rational Ecology: Environment and Political Economy*; Basil Blackwell: New York, NY, USA, 1987.
101. Parkinson, J. *Deliberating in the Real World: Problems of Legitimacy in Deliberative Democracy*; Oxford University Press: Oxford, UK, 2006; ISBN 0-19-929111-X.
102. Rawls, J. *Political Liberalism*; Columbia University Press: New York, NY, USA, 1993.
103. Bartlett, R.V.; Baber, W.F. From rationality to reasonableness in environmental administration: Moving beyond proverbs. *J. Manag. Hist.* **1999**, *5*, 55–67. [[CrossRef](#)]

104. Dryzek, J.S.; List, C. Social Choice Theory and Deliberative Democracy: A Reconciliation. *Br. J. Polit. Sci.* **2002**, *33*, 1–28. [[CrossRef](#)]
105. Palsson, G.; Szerszynski, B.; Sörlin, S.; Marks, J.; Avril, B.; Crumley, C.; Hackmann, H.; Holm, P.; Ingram, J.; Kirman, A.; et al. Reconceptualizing the ‘Anthropos’ in the Anthropocene: Integrating the social sciences and humanities in global environmental change research. *Environ. Sci. Policy* **2013**, *28*, 3–13. [[CrossRef](#)]
106. Hendriks, C.M. Integrated Deliberation: Reconciling Civil Society’s Dual Role in Deliberative Democracy. *Polit. Stud.* **2006**, *54*, 486–508. [[CrossRef](#)]
107. Habermas, J. *The Structural Transformation of the Public Sphere: An Inquiry into a Category of Bourgeois Society*; MIT Press: Cambridge, MA, USA, 1991; ISBN 9780262581080.
108. Vatn, A. Rationality, institutions and environmental policy. *Ecol. Econ.* **2005**, *55*, 203–217. [[CrossRef](#)]
109. Grossmann, I.; Brienza, J.P.; Bobocel, D.R. Wise deliberation sustains cooperation. *Nat. Hum. Behav.* **2017**, *1*, 0061. [[CrossRef](#)]
110. Steg, L.; Vlek, C. Encouraging pro-environmental behaviour: An integrative review and research agenda. *J. Environ. Psychol.* **2009**, *29*, 309–317. [[CrossRef](#)]
111. Turaga, R.M.R.; Howarth, R.B.; Borsuk, M.E. Pro-environmental behavior. *Ann. N. Y. Acad. Sci.* **2010**, *1185*, 211–224. [[CrossRef](#)] [[PubMed](#)]
112. Sunstein, C.R. Behavioral analysis of law. *Univ. Chic. Law Rev.* **1997**, *64*, 1175–1195. [[CrossRef](#)]
113. Fung, A. Deliberation before the revolution toward an ethics of deliberative democracy in an unjust world. *Polit. Theory* **2005**, *33*, 397–419. [[CrossRef](#)]
114. Sunstein, C.R. *Going to Extremes*; Oxford University Press: New York, NY, USA, 2009; ISBN 978-0-19-537801-6.
115. Sunstein, C.R. *#republic: Divided Democracy in the Age of Social Media*; Princeton University Press: Princeton, NJ, USA, 2017; ISBN 9780691175515.
116. Mummolo, J.; Nall, C. Why Partisans Do Not Sort: The Constraints on Political Segregation. *J. Polit.* **2017**, *79*, 45–59. [[CrossRef](#)]
117. Steffen, W.; Richardson, K.; Rockstrom, J.; Cornell, S.E.; Fetzer, I.; Bennett, E.M.; Biggs, R.; Carpenter, S.R.; de Vries, W.; de Wit, C.A.; et al. Planetary boundaries: Guiding human development on a changing planet. *Science (80-.)* **2015**, *347*, 1259855. [[CrossRef](#)] [[PubMed](#)]
118. Eckersley, R. *Environmentalism and Political Theory: Toward an Ecocentric Approach*; SUNY Press: Albany, NY, USA, 1992.
119. Eckersley, R. Geopolitical Democracy in the Anthropocene. *Polit. Stud.* **2017**, *65*, 983–999. [[CrossRef](#)]
120. Bell, D. How can political liberals be environmentalists? *Polit. Stud.* **2002**, *50*, 703–724. [[CrossRef](#)]
121. Sen, A.K. Why We Should Preserve the Spotted Owl. *Lond. Rev. Books* **2004**, *26*, 10–11.



© 2019 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).