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Article

The Role of Deliberative Collaborative Governance in Achieving Sustainable Cities

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Abstract: Sustainability issues involve complex interactions between social, economic, and environmental factors that are often viewed quite differently by disparate stakeholder groups. Issues of non-sustainability are wicked problems that have many, often obscure causes, and for which there is no single, straightforward solution. Furthermore, the concept of sustainability is itself contested. For example there are disputes over whether a strong or weak interpretation of sustainability should be adopted. In cities, as elsewhere, sustainability therefore requires discursive plurality and multiple sites of action. It is the thesis of this paper that effective problem solving, decision-making and enacting of a sustainability agenda require deliberative collaborative governance (DCG), a logical hybrid of the closely related fields of deliberative democracy and collaborative governance. We provide a provisional typology of different modes of deliberative collaborative governance, explaining each with a sustainability example, with a particular focus on DCG initiatives for planning in Western Australia. It is argued that the lens provided by such a typology can help us to understand the factors likely to promote better resolution of wicked problems and increased sustainability.

Keywords: sustainability; deliberative collaborative governance

1. Introduction

Sustainability issues involve complex interactions between social, economic, and environmental factors that are often viewed quite differently by disparate stakeholder groups. The concept of sustainability is itself contested. For instance a distinction has been made between ‘weak’ and ‘strong’ sustainability according to how radical their requirements for reform are, and their analysis of the causes of unsustainability [1]. Furthermore, sustainability issues almost invariably stem from what have been called ill-structured, or ‘wicked’, problems: problems that may have many or obscure causes and for which there is no clear, straightforward solution [2]. Wicked problems range from the mundane (‘Should we route a highway through the city or around it?’) to the profound (‘How should we live our lives?’). As defined by Horst Rittel, who coined the term, wicked problems are distinguished by six characteristics, presented here in modified form:

- a. The problem can’t be understood fully until a solution has been proposed. This seemingly paradoxical conclusion stems from the observation that every solution offered for a wicked problem exposes new aspects of it, requiring further adjustments to what is proposed. Indeed, there is and can be no definitive statement of ‘the problem’. The problem is ‘ill-structured’, an evolving set of interlocking variables, effects, and constraints that depends completely on the context in which it is encountered. Moreover, what ‘the problem’ is depends on the perspective from which an answer to the question is solicited—different stakeholders have fundamentally different views about what constitutes the unsatisfactory condition that warrants a response.
- b. There is no clear and uncontested rule for determining when to stop. Because there is no definitive conception of the problem, there can be no definitive solution. The problem-solving process concludes when participants run out of resources—time, money, energy—not when some pre-determined criterion of success is met.
- c. Solutions are not right or wrong. Since no clear, consensual criterion of success exists, solutions offer outcomes that are only ‘better’, ‘worse’, ‘good enough’, or ‘not good enough’. The adequacy of a solution depends on perception of the problem. Stakeholders assess solutions from within their respective sociopolitical contexts. Conclusions are ‘relative’ because each perspective is ‘on all fours’ with every other.
- d. Every problem is novel and unique. For every problem, large numbers of contributing factors are embedded in a dynamic social context. The result is that problems are unlikely to have been encountered previously, and no two are exactly alike; indeed, each differs substantially from others. Over time, experience may suggest that some approaches to solving a problem are better than others. But in its details, every wicked problem is unique.
- e. There is no alternative solution. Actually, there may be no solution at all. Or there might be many solutions, none of which can be usefully compared to the others. Or there might be solutions that are never thought of. Devising a solution requires imagination and creativity. Settling on one requires judgment—an ‘educated guess’.
- f. Every solution is a ‘one-shot operation’. Every attempt to solve a wicked problem has consequences that, as a practical matter, preclude its replication. The ‘Catch 22’ of such problems is that one can’t learn about the problem without trying solutions, but every solution

tried is costly and produces consequences that, intended or not, are apt to generate additional problems of a wicked nature.

It is clear that many of the social problems that communities, cultures, and nations face today—mundane or profound—are wicked in nature. Indeed, most of the challenges to sustainability now confronting human beings bear the features associated with ‘wickedness’.

Unfortunately, even at the lowest levels of socio-political organisation—cities, towns, neighbourhoods, and blocks—efforts to devise and implement effective responses to wicked problems are constrained by the fact that the existing civic and governmental ‘infrastructure’—relationships, practices, habits, procedures, and processes—was not designed to handle, and has not been upgraded so it can handle the wicked problems that impede improvement in the quality of life and that increasingly threaten the quality of life that has been achieved. Disconnection and lack of collaboration between the community, government, non-government organizations, and the private sector is a major barrier to building sustainable cities and countries. In addition, existing civic and governmental infrastructure does not provide a civic space in which communities can deliberate about what sustainability means to them, an essential first step in determining what action should be taken to achieve sustainability.

The good news is that when decision-making authority is shared among diverse stakeholders, it can help address these barriers. What we call ‘Deliberative Collaborative Governance’ (DCG) draws together the full range of interested parties, along with their perspectives and resources, to confront the complexity and intractability of wicked problems, which stymie even the best-administered governments. Around the world today, the use of DCG strategies is growing [3–5]. Although it is not the only way for people to work together, and not always the best way for them to do so [6], various forms of sharing responsibility, authority, and power are being explored to address sustainability challenges that exceed the problem-solving capacities of existing institutions.

In this paper, we use ‘Deliberative Collaborative Governance’ (DCG) to capture how shared responsibility, authority, and power, coupled with a pragmatic, problem-solving orientation to wicked problems that emphasises deliberative analysis, fact-finding, and policy evaluation, can move communities toward sustainability. We offer a rudimentary typology of DCG approaches as a first step toward further research that will identify the factors that contribute significantly to the achievement of effective outcomes. Because our typology constitutes a snapshot of an emerging field still in its infancy, it is highly provisional; we expect it will change as additional cases come to light.

2. Unsustainability: A Wicked Policy Problem

Impediments to sustainability, such as the threat posed by climate change, are ‘wicked’ problems [7–9]. They have no single correct solution, which is to say they cannot be solved through the application of technical expertise alone. Technical remedies might contribute substantially to mitigating problems such as climate change and frozen capital markets, but without the willing collaboration of a large number of stakeholders, including the general public, efforts to solve them are bound to fall short. The problems are so complex, and the contributing factors so many—if they are known at all—that ‘solving’ them becomes a matter of judgment—the judicious exercise of ‘educated

guesswork’—to identify the response with the best prospects for generating the most acceptable mix of good and bad consequences.

Even then a ‘solution’ may prove elusive. Parties having a stake in how the problem is defined and how it is addressed bring to the table a variety not only of interests and priorities, but also belief systems, values, kinds of knowledge, experiences, and perceptions. Identifying policy options and choosing among them must proceed hand-in-hand with efforts to integrate and reconcile the host of interpersonal and inter-group differences that, left unattended, will prevent people from communicating constructively and working together productively.

Efforts to respond effectively to wicked sustainability problems often founder on the shoals of problem “framings” (definitions), analyses, and policy proposals that would lead, as vigilant critics are quick to point out, to further problems, at least some of which may be wicked themselves. Such efforts can result in ‘endless suites of continuing unsolved outcomes’ ([8], p. 315). O’Riordan cites the well-intentioned ambition to replace fossil fuels with a climate-friendly (and hence sustainable) source of energy. Whatever its merits, the production of biofuel has been met with unforeseen complications such as land use issues, loss of biodiversity, and higher food prices. The complications might have been unavoidable, but the fact that they were unforeseen illustrates why participation in efforts to solve wicked problems must include all stakeholders (including the general public).

O’Riordan argues that ‘wicked problems are unsolvable if conventional patterns of institutional design and decision tactics are followed’ ([8], p. 315). Organisations and institutions in the governmental, non-governmental (NGO), and for-profit sectors exist to apply technical expertise to problems. But if the problem is ‘wicked’, it can’t be solved through the application of technical expertise alone. Organisations and institutions thus can play a role—even an indispensable role—in responding to it, but by themselves they cannot solve it.

Reliance on existing institutions and processes is especially problematic in urban areas, where multiple entities—municipal governments, counties, regional authorities, special districts, state government, national government—have jurisdiction (sometimes sole, sometimes shared) over different facets of community life. Thus, for example, reducing a city’s carbon footprint might require collaboration with numerous agencies concerning dozens of issues. New working relationships, and perhaps new structures and processes, will be needed to achieve such goals. Marshaling the knowledge, experience, information, resources, and readiness to share responsibility, authority, and power will require collaboration between governments, non-government organisations, the private sector, and civil society. Anything less than full participation by all who are connected in ‘intricate web(s) of interactions in linked systems, both natural and social’ ([10], p. xxiii) will reduce the prospects for success.

Sustainability issues arise over the full range of contexts, from local to global. Whatever the setting, effective responses depend on successfully integrating ‘universal (scientific) knowledge with knowledge particular to the social, ecological, and historical circumstances of particular places’ ([11], p. 239). Local knowledge includes the ‘practical wisdom’ of ordinary people [12]. But even municipal governments cannot achieve sustainability through a ‘grand master plan with precise mapping of the end point and the trajectory to get there’ ([10], p. xxiii). This is evidenced by the abysmal implementation record of countless city master plans that sit on dusty shelves across Australia. The explanation is simple: sustainability requires that all stakeholders accept responsibility for devising and

implementing a systemic response; and all must be accountable to the others for performing the tasks that fall within its sphere of responsibility. Hence the need for new governance mechanisms in which inclusive, deliberative, collaborative governance processes can be embedded. As Garmendia and Stagl argue, 'Advances in our understanding of how natural and social systems interact along spatial and temporal scales need to be substantiated by democratic mechanisms which can deal with inherent problems of continuous change, uncertainty, and multiple legitimate perspectives of the systems' ([13], p. 1712).

Similarly, Stoll-Kleeman *et al.* argue that progress toward sustainability requires that citizens be connected 'to new vistas of governance' involving

'many centres of power at every conceivable scale. [Success] will be determined by partnerships with business and civil society through innovative formal and informal arrangements. It will require a participatory form of democracy whose early manifestations are beginning to appear.' ([11], p. 239).

Many observers have cited widespread participation in sustainability efforts as a key to sustainability. According to the report of the 1992 United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro, 'Environmental issues are best handled with the participation of all concerned citizens, at the relevant level' [14]. Similarly, one of the European Commission's 'Twelve principles of sustainable development' is that 'decisions affecting sustainable development should be open and based on informed participation by affected and interested parties.' ([15], p. 120).

In turn, a key element of effective participation is deliberation: the collaborative process of identifying and weighing policy options with a view to establishing priorities and articulating a direction for action. We begin with a brief description of the theory and practice of 'deliberative democracy', as this was the starting place of the authors' interest in collaborative governance. In our view, deliberative democracy addresses some of the deeply intransigent inadequacies of our current democratic systems in addressing wicked problems. Hence, its underlying principles are useful elements to keep in mind in the search for more effective ways to address wicked problems.

3. Deliberative Collaborative Governance (DCG)

While some versions of representative democracy such as the corporatist forms of government in Nordic countries are relatively collaborative and participatory [16], pluralist models, such as that practiced in Australia, endorse universal 'expert' knowledge and favour engagement with stakeholders as opposed to citizens. This has often meant that lay-citizens' knowledge is devalued and that they are therefore disempowered, while special interest groups take a key role. These forms of representative democracy have been widely criticised for their failure to engage citizens beyond their role as voters in elections. Popular contentment (if it ever existed) with arrangements in which ordinary people focus on private life and leave the governing to elected officials and their appointees is evaporating. Throughout the world, public dissatisfaction with the responsiveness of government to the needs and concerns of ordinary people has grown steadily in recent decades [4]. Failure to create avenues by which citizens can participate more actively and fully in the policy-making process has compounded their feelings of alienation and exclusion from the arena of democratic authority and power. Moreover, it has

impoverished political decision-making by denying a voice to people whose beliefs, attitudes, and desires are more nuanced and more temperate than those held by moneyed and organised interest groups. Furthermore, many governments silo their various responsibilities into bodies that are disconnected from each other, and from the broader community, inhibiting integration of perspectives necessary for decisions, policies and programs supporting sustainability.

Governments have attempted to mitigate popular dissatisfaction through ‘community engagement’, which too often has taken the form of ‘consultation’ in which the public is invited to express its concerns and wishes, but is denied real influence. Not surprisingly, failure to include the public as a genuine partner in decision-making frequently has back-fired, leading to a vicious cycle of more ineffective policies, mounting public frustration, and increasing refusal by the public to support even basic governmental functions [17].

‘Deliberative democracy’ is an approach to democratic self-governance that may point the way toward methods by which the deficiencies of institutions and practices in representative democracy might be remedied. Deliberative democracy emphasises the indispensable role of ‘ordinary citizens’ in identifying and weighing policy options, establishing priorities, and articulating a direction for action on the part of both government and the community. It does not constitute an alternative to representative democracy; rather, it suggests how democracy might be improved by attending to the ‘depopulated’ democratic political arena, the ‘public space’ in which people engage each other in discussion of the challenges and opportunities facing them collectively. Deliberative democracy stresses the importance of revitalizing citizen participation in democratic political and civic life. In doing so it positions the public as a valuable partner with government officials in the policy-making process—as a beneficial complement to the work of institutions rather than a complete substitute for it.

Deliberative democracy’s emphasis on citizen participation and deliberation fits well with the purpose and principles of another emerging concept: ‘collaborative governance’. Collaborative governance emphasises participation by political parties, government agencies, and/or organized stakeholding groups in collectively crafting a policy or recommendations to decision-maker(s) who with legal authority to adopt, implement, and enforce them. Although the locus, of authority often remains with government, collaborative governance calls for a genuine partnership in which all have substantial influence. Typically, government would be expected, in so far as the law permits, to act in accordance with the recommendations agreed to by the partners. Collaborative governance arrangements may allow for various forms and degrees of engagement with or participation by members of the general public.

Deliberative democracy and collaborative governance are not without their critics. Each has strengths and weaknesses. In the main, deliberative democracy’s connection to and impact on institutional policy-making has received little attention [18]. Similarly, the contexts, forms, and effects of collaborative governance initiatives have not been studied sufficiently.

Despite the need for further empirical work on deliberative democracy and collaborative governance, it is worth considering how their respective principles and practices intersect, and how their strengths might be combined to the benefit of both. In particular, how might a hybrid of the two—let us call it ‘Deliberative Collaborative Governance’, or ‘DCG’—help cities and similar entities at the lowest level of government achieve sustainability? For present purposes, we will define DCG as any policy-making procedure or process in which (1) ‘ordinary citizens’ participate (along with one or

more government agencies and/or other stakeholding groups) in collaboratively performing tasks such as setting priorities, crafting or analysing policy proposals, devising plans, and recommending actions; (2) participants deliberate together concerning options for action or policy adoption; and (3) the public's role is that of a full partner with influence sufficient to secure positive responses from the other stakeholders [19].

Collaborative governance is interpreted and practiced in a variety of ways [3–6,20–32]. As Emerson *et al.* note, despite the increasing use of the term 'collaborative governance' in public administration literature, its definition remains 'amorphous and its use inconsistent' ([4], p. 1). Ansell and Gash's definition of collaborative governance is one that is widely cited in the literature. They focus on collaborative governance in the formal public sector, characterising it as an 'arrangement where one or more public agencies directly engage non-state stakeholders in a collective decision-making process that is formal, consensus-oriented, and deliberative, and that aims to make or implement public policy or manage public programs or assets' ([3], p. 544). In comparison, Emerson *et al.* incorporate a greater array of partners in their generic definition of collaborative governance than do Ansell and Gash [3], including those from the private sector, government, non-government organisations, but also 'community-based collaboratives involved in resource management', with a 'fuller range of emergent forms of cross-boundary governance', including grassroots-run collaborations ([4], p. 3).

While many collaborative governance researchers suggest that deliberation does or should play an important role in collaborative governance [3,4], in our conception of deliberative collaborative governance, deliberation—the identification and weighing of policy options, in a context of careful and respectful consideration of different values and viewpoints, with the aim of establishing public priorities and articulating a direction for public action—is an *essential* element, that does not appear to be present to the same degree in all instances of collaborative governance we reviewed in the literature. Indeed some see a distinction between the deliberative aspects of collaborative governance and the practice of deliberative democracy, contending that while collaborative governance and deliberative democracy are related they are not the same thing in practice, or at least have not been historically [33].

Furthermore, while others note that involvement of citizens and the public has occurred in some collaborative governance initiatives to varying extents ([4], p. 3), we argue that citizens have an *indispensable* role in deliberative collaborative governance, and that wherever possible, governments responsible for collaborative governance initiatives should add citizens to the list of stakeholders as a matter of course, in keeping with the theory of deliberative democracy. Without substantial participation by persons whose views and value-priorities do not align perfectly with those of a given organised stakeholding group, the deliberative process is deprived of the tempering influence of people whose vision of what is good for the community as a whole is broad. The general public is an indispensable source of information, knowledge, experience, and pragmatic appreciation of the need for judgment and compromise. The public is not represented adequately by even the most inclusive assembly of organised groups, with their relatively narrow concerns and agendas. Significantly for discussions of sustainability policy, citizens bring with them needs, hopes, and fears that must be addressed if policies are to prove effective and durable. Without the willing assent of the public qua public, such policies will prove elusive. It is not much of an exaggeration to say that, in the political climate that prevails today in many democratic societies, the public is apt to regard discussions among

elites as akin to a pack of wolves working out what to have for dinner while the sheep stand outside and watch.

The key elements of deliberative collaborative governance, a hybrid of deliberative democracy and collaborative governance theories, can be summarised as (1) inclusion, with the general public or relevant community represented in its full demographic diversity [34]; (2) deliberation, with the weighing of policy options and consequences in terms of their impact on people's needs, values, and concerns; and (3) influence, with the public's perspective carrying sufficient authority to ensure that people's needs, values, and concerns are addressed clearly and adequately in whatever decisions emerge from the process [33].

While deliberativeness is recognized as an essential element of collaborative governance in by some authors [4], the extent of deliberativeness in various case studies is difficult to discern, and the theoretical and practical commitment to including citizens as an essential aspect of collaborative governance varies. Since we are proposing a new normative theory and practice of collaborative deliberative governance [35] we are suggesting that the key elements of DCG listed above are useful 'markers' to keep in mind, whether an initiative proceeds 'top down' (*i.e.*, is initiated by government), 'bottom up' (*i.e.*, originates within the community), or arises in some other manner.

Thus far we have elaborated the concept of DCG without reference to empirical examples. DCG is above all a normative ideal, a form of democratic governance we believe is more likely to be capable of addressing wicked problems and hence is worthy of aspiration. At the same time, from our literature review, we became aware that DCG is beginning to emerge in practice; aspects of it, not always fully realised, are appearing with greater frequency around the world. This isn't surprising, because DCG, as we have characterised it, constitutes a reasonable response to defects and deficiencies in the prevailing institutionalised practice of representative government, as well as the system context from which it emerges.

Rather than simply citing instances in which aspects of DCG are beginning to appear, we have developed a rudimentary, highly provisional typology, through an inductive analysis of literature in the fields of collaborative governance and deliberative democracy specifically, and public administration and political science more broadly. Other analysts have undertaken related work in the field of collaborative governance. For instance, Emerson *et al.* provide an integrative framework for collaborative governance, with 'three nested dimensions': (1) the system context; (2) the collaborative governance regime; and (3) collaboration dynamics ([4], p. 6). Their broad 'system context' refers to political, legal, socioeconomic, environmental and other factors that 'affect and are affected by' the collaborative governance regime, and leads to discussion of 'system drivers' including leadership, consequential incentives, interdependence of individuals and organisations, and uncertainty associated with wicked problems, that stimulate different forms of collaborative governance. Their 'collaborative governance regime', nested within the system context, encompasses 'the particular mode of, or system for, public decision making in which cross boundary collaboration represents the prevailing pattern of behaviour and activity' ([4], p. 6). Finally, they place principled engagement (including deliberation), shared motivation and capacity for joint action in the category of 'collaborative dynamics'. Their definition of principled engagement as including 'fair and civil discourse, open and inclusive communications, (and) balanced representation' ([4], p. 11) resonates with deliberative democracy theory and our related definition of the key elements of deliberative collaborative governance.

Our typology explores territory consistent with the second level of Emerson *et al.*'s nested framework—the collaborative governance regime. It is important to note that the forms of DCG outlined in our typology are influenced by, and can influence, particular sociocultural and political circumstances, again in keeping with Emerson *et al.*'s nested framework. This iterative relationship means that DCG processes must be designed in a way that has the potential to achieve desired outcomes within the system context, with simultaneous consideration of the likely or desired impacts DCG might have on the system context itself. This typology can be used as comparative lens through which to consider the purposes, principles and values of democratic governance, including representation, transparency, responsiveness, fairness, political authority and power, and effectiveness of various modes of DCG. We envisage that our typology could be used *prospectively*, for instance by aiding in the consideration of what form or forms of DCG might be appropriate in a given context. It could also be used *retrospectively* to help to evaluate a number of aspects of DCG, including the quality and nature of the DCG processes that emerge in practice, the extent to which desired outcomes are achieved, and any effects observed in the system context. Furthermore, given that this typology represents a reading of existing modes of DCG as described in the literature, and that the relationship between system context and DCG is dynamic and changing, the typology could provide a starting point for those wishing to track and analyse any transformations of modes of DCG that occur over time.

We began this research by reading the large global literature that is loosely grouped under the umbrella of collaborative governance to see whether it was possible to induce potentially useful ways of categorising deliberative collaborative governance in order to better understand aspects of its form, purpose and potential impact. Such categories could help to clarify which case studies are compatible enough to underpin broad analytical insight into DCG. Using our own lens of governance, three groupings emerged from the literature—initiatives that:

- (1) Legitimised and better informed existing government decision making, by formally linking collaborative processes to conventional governance processes:
 - a. through an institutionalised process; or
 - b. at the discretion of people in power in government hierarchies.
- (2) Challenged and/or gradually transformed existing government power structures:
 - a. intentionally, through formal processes, including changes to legislation, policy and standard practice in government agencies, where decision making power is at least partially redistributed; and
 - b. informally, through increased learning, understanding, and tacit knowledge about the role of deliberative collaboration throughout government agencies and the networks they are connected to, intentionally or unintentionally.
- (3) Emerged beyond or outside conventional government processes, through:
 - a. informal, but often well-organised processes driven from the grassroots, usually by stakeholders rather than lay-citizens, that achieve outcomes irrespective of government. They may produce outcomes or models of collaboration that governments subsequently learn from or adopt, and that could be evaluated deliberatively by a random sample of citizens to provide the basis of broader policy [36].

- b. Formal processes involving non-government stakeholders, for example industry bodies who organise to self-regulate.

In addition, some DCG initiatives explicitly involve iterative collaborative action as well [4,32].

For governments in particular, this typology can be seen as a first step toward making the intentions of those who organise and implement DCG initiatives more conscious. This task is particularly relevant to government institutions since they are often required to follow established procedure rather than to undertake strategic reflection on their missions. At a minimum, as a result of clarifying intent, governments can more adequately evaluate the degree to which they have been successful in achieving their objectives. Furthermore, this typology takes into account grassroots DCG that occurs beyond or without government. Since this form of DCG is clearly situated outside established government procedure it may provide sources of innovation that governments can link into or learn from, in order to better facilitate sustainability outcomes stimulate strategic reflection, and improve their own DCG processes.

Of course, it is important to keep in mind that in dealing with wicked problems, serendipity is likely to play a significant role, and there may be unintended consequences from interventions, both helpful and problematic. Hence, by being more conscious and clear about objectives, those who organize DCG initiatives can also more clearly discern what emerges over and above their intentions. Our hope would be that at some future time, we might be able to more clearly identify and assess the factors that contribute significantly to positive outcomes.

In order to provide a substantive understanding of these three groupings, several case studies are described below that elucidate the typology. The intent is not to provide a comprehensive list or to argue that the examples we have outlined make the case for a particular grouping. Rather, our intent is to show how the particular grouping plays out in real life. Particular instances of DCG-like activities, of course, may not fall neatly into one of these three purpose-defined types. One collaborative governance activity may precede another, or they may overlap or operate concurrently. For example, grassroots collaborations initiated and conducted outside the governmental sphere might subsequently influence government decision making, feed into government processes, or be used as a model for other collaborations. Similarly, collaborative governance activity might be undertaken both to inform decision-making in the short term and to enable participants to experience DCG so that they are more likely to support its institutionalisation in future.

3.1. Informing Government Decision Making

Examples of DCG efforts undertaken for this purpose include the deliberative democracy initiatives carried out in Western Australia from 2001–2005 by the Minister for Planning and Infrastructure, Alannah MacTiernan. The Minister's aim was to inject sustainability considerations, such as the need for effective urban planning and public transport, into the official policy-making process. The Minister's concern was that she disproportionately heard the views of the technocrats, other experts, stakeholders, and some highly vocal community members, but did not know the views of ordinary people who had the opportunity to seriously consider the issue at hand. Consequently, Minister MacTiernan supported assembling a demographically representative 'mini-public' (with least one-third of participants randomly chosen) to deliberate several issues [37], resulting in outcomes that, because

they clearly reflected the considered views of the population, were adopted readily by the State Government [38].

Although informing government policy-making (and thereby indirectly improving popular perceptions of government responsiveness) provided the impetus for the Western Australia deliberative democracy activities conducted in the period 2001 to 2005, it should be noted that those activities served as well the second purpose for which DCG efforts might be undertaken: challenging or altering existing government decision-making outcomes, processes, or structures. While formal governance mechanisms in Western Australia often seem to prohibit DCG, MacTiernan utilised a number of non-binding DCG options that are open to government decision makers. Although ultimate decision making authority resides with the State Government, the Minister had the authority to use her discretion with regard to matters falling entirely within her jurisdiction. In those instances, she often willingly abided by the recommendations of the citizen deliberators, effectively transferring authority to the community and thereby altering the official policy-making process.

Moreover, the Minister committed to transparency so that participants could see to what extent their deliberations influenced officials. In addition to the Minister herself, other Members of Parliament and senior executives and staff from relevant agencies and departments were expected to join in the public deliberations, partly in the hope that through the experience they would be more open to partnering with the public in future. She reinforced this hope with a clear statement of intent that government would share authority to the degree permitted by law and practical requirements.

In two of the deliberative events held in Western Australia, sustainability was especially important for participants. The 'Dialogue with the City', a 21st Century Town Meeting with 1,100 participants, played an important role developing a plan for the capital city, Perth, and the surrounding metropolis. Several sustainability issues were taken up by participants, including the challenges associated with urban sprawl. At the event, Minister MacTiernan asked for 100 volunteers to work in small teams to turn the Dialogue's outcomes into a Community Plan. Cabinet subsequently accepted the Plan, which became the official regulatory framework. In another instance, the results of a deliberative survey result in a coastal town became the basis for government policy on building heights in new developments. Building heights have become an important topic in Western Australian cities and large towns as part of the broader conversation about how to address the unsustainable aspects of urban sprawl through increasing density. The deliberative survey [39] revealed greater support for a moderate increase in building heights than was apparent in the community prior to the public deliberation [40].

A second example of DCG from Western Australia that has supported improved planning for sustainability is the 'Geraldton 2029 and Beyond' Project. In Greater Geraldton, efforts have been made to embed DCG at the local level of government. The Geraldton project illustrates both the possibilities and the limitations of purposeful efforts to implement DCG. Since 2010, the City has invited stakeholders and everyday citizens to participate in numerous deliberative processes to imagine the future for the region and to participate actively in realising it. These processes have resulted in plans and actions that are more far-reaching than local decision makers had ever envisaged. They include creating a carbon-neutral city-region, urban renewal to enhance sustainable living while protecting the environment (particularly the beaches, rivers, and ranges), and preparing for a high-tech, digital way of life.

In order to develop DCG further, joint community/government action teams carry out prioritised proposals developed by the community [41]. To make the decision-making path through Council easier, and to make Council more accountable, elected Council members are now leading project teams and stewarding their recommendations through the political process [42]. Perhaps most important of all, the City is pioneering Participatory Budgeting (PB). If successful, PB will go a long way toward institutionalising collaborative deliberative governance (we return to PB below, in Section 3.2).

The designers of the DCG project in Greater Geraldton hope their efforts will lead eventually to fundamental structural change in local government processes. They know, however, that despite the achievements to date, embedding DCG remains a challenge and is by no means assured.

Importantly, the impetus to undertake deliberative collaborative governance in order to better inform government decision-making may not necessarily originate from within government—it can come from external parties, and possibly the grassroots. For example, in the City of Edmonton, in Alberta, Canada, a DCG initiative—a Citizens' Panel [43]—was undertaken in 2012 on the subject of Edmonton's Energy and Climate Challenges. The City agreed to run the Panel to look at the goals proposed in Edmonton's Energy Transition Discussion Paper. This decision was taken in large part as a result of the enthusiasm and perseverance of the Alberta Climate Dialogue (ABCD) group (researchers from the University of Alberta, together with local sustainability activists, and an international team of deliberative democracy researchers and practitioners). The group had been successful in winning a significant Canadian research grant to undertake action research into the use of deliberative democracy in tackling and energy and climate change issues in Alberta. This action research has taken several years to actualise, gathering together and keeping involved a broad base of stakeholders, and developing a public deliberation that would be acceptable to the City administration and elected officials.

Of course, unlike many ordinary citizens, the researchers had the benefit of independent funding to enable them to continue their conversation with the City over the long term and were supported by the credibility of the university. These 'luxuries' may not be available to all citizens; therefore the extent to which ordinary citizens could catalyse this type of DCG needs further examination. Ultimately though, the City of Edmonton invited citizens to participate in the Citizens' Panel, run in collaboratively between the City's Office of Environment, the Alberta Climate Dialogue group, and the Centre for Public Involvement, and made a commitment to seriously consider their recommendations in developing an energy transition plan [44]. Citizen representatives from the Panel recently presented the final recommendations to the City of Edmonton, and it now remains to be seen what action the City will take in response.

3.2. Altering Existing Government Decision-Making Outcomes, Processes, or Structures

Institutional procedures and processes often affect substantive outcomes. Recognising this fact of institutional life, parties inside or outside government may seek to alter the rules that dictate where, when, and how substantive matters are considered and acted upon.

For example, one way policy-makers seek to shift responsibility for difficult or controversial decisions is to share authority with entities outside government, or even devolve it [27,45]. New governance mechanisms can be created formally or informally, and may be ad hoc ('one off') or

institutionalised. Participatory budgeting (PB) is an example of altering the process of government decision making. It assigns final decision making authority to citizens, albeit typically in relation to a limited portion of a budget [46]. Participatory budgeting was first used in Porto Alegre, Brazil, in 1989, and is now being tried around the world [47]. Some of these versions of PB represent a more radical departure from conventional governance practices than do others. Many bear little resemblance to the most transformative forms, such as that practiced in Porto Alegre.

The experience of Porto Alegre suggests the long-term value and feasibility of implementing DCG in relation to matters that typically are viewed as the province of experts ([20], p. 10). This is especially noteworthy in regard to sustainability decision making, where expert and lay-perspectives must be woven together in order to construct a shared understanding of the challenge and, even more important, to craft and implement a response appropriate to the complexity of the systems that must be influenced. In Brazil, the constitution provides incentives to municipalities to support participatory policies. PB is intended to promote governmental transparency and social justice by encouraging citizen participation and re-directing resources to low-income neighbourhoods.

Porto Alegre also stands as a successful example of deliberative collaborative governance. Avritzer [21] argues that three new arrangements, all involving deliberation, give the city's PB a strongly deliberative character: 'regional and thematic assemblies, the Participatory Budgeting Council (COP), and deliberation on the constitution for participatory budgeting by the participants themselves' ([21], p. 627). In the Participatory Budgeting Council (COP), for example, community members deliberate with each other concerning their priorities and with municipal officials over budget allocations (which reflect different priorities) ([21], p. 628). The COP also deliberates continuously about the rules of deliberation themselves ([21], p. 628).

In Western Australia, the success of the Geraldton 2029 project has given the local government confidence to proceed with an integrated approach to participatory budgeting. In 2012, the first stage of participatory budgeting commenced as part of a precinct planning initiative. Over 50 people residing or working in the precinct participated in this initiative. During this process of co-creating a renewal plan to redesign their precinct, the participants developed options to immediately improve their precinct, and then determined their priorities through voting. Some volunteered for implementation teams to help put their choices into effect. Though the budget allocation was relatively small in this instance, totaling AU\$50,000, similar amounts will now be made available for precinct planning across the City Region. Moreover, this has led to a change in the City's requisitioning process, which, for such precinct planning initiatives, has now become participatory, with the citizens co-deciding the criteria for buying the prioritised infrastructure. In addition, since achieving carbon neutrality was a key community goal, residents involved in precinct planning initiatives will now consider carbon footprint data as a key criterion for urban design decision-making. Over the years, the community deliberation is becoming more sophisticated in its capability to address wicked problems.

During 2013, a PB initiative similar to the Porto Alegre model will determine the allocation of community grants totaling around \$100,000. Existing and new community groups will develop their proposals for funding, including the pros, cons and costing. If relevant, the carbon footprint data will also be used to elucidate the pros and cons. Finally, all residents will be encouraged to allocate the available budgets by voting for their favourite project [48]. In a different variation of a PB that directly addresses the wicked problems involved, the whole City Region budget allocation will be considered

by a randomly-chosen sample of 25 residents, stratified to closely represent the local population mix. Their task will be to determine the range and level of services in the community, including the priority services, the level they should be delivered, and the preferred funding sources for their preferences. The Panel will take several months to study the City/Region budgetary process, the Strategic Community Plan for greater sustainability, and the modeling and data required to support informed decision-making. The general public will also be involved via interactive sessions using social media and face-to-face workshops. The randomly-selected citizen group will deliberate and present their final recommendations to the Council, City and broader public.

Because the law in Western Australia assigns decision making power to the elected Council, the final decisions will be determined by the Council's willingness to accept residents' recommendations. At the outset of the larger PB processes, the Council will clarify whether they will accept the PB recommendations unconditionally [49]. In the rolling precinct renewal PBs, the City administration has agreed to accept the priorities of the local precinct PBs and to work with local groups to implement their recommendations.

3.3. Collaborative Governance Beyond or Without Government

Deliberative collaborative governance may be practiced independently of government, sometimes achieving what formal government processes cannot [32]. DCG can be implemented when government has failed to deal with an issue satisfactorily; when government policy is deficient; when state-supported governance is limited or non-existent; or when government is not relevant to the task [50]. In this context, we need to amend slightly our initial definition of DCG. Simply by removing government as one of the partnering stakeholders, however, we can keep the definition intact: DCG is 'any policy-making procedure or process in which (1) 'ordinary citizens' participate (along with other stakeholding groups) in collaboratively performing tasks such as setting priorities, crafting or analysing policy proposals, devising plans, and recommending actions; (2) participants deliberate together concerning options for action or policy adoption; and (3) the public's role is that of a full partner with influence sufficient to secure positive responses from the other stakeholders'.

Clearly, the absence of effective global governance structures magnifies the challenge of devising and implementing effective responses to sustainability concerns such as climate change. As Dryzek notes, the global political system has so far failed to produce a cohesive policy response to climate change while greenhouse gas emissions continue to rise [51]. For example, as Reidy and Herriman [52] note in their assessment of international climate change negotiations at the Conferences of the Parties (COP), 'the outcome of COP-15 fuelled existing debates about the ability of current systems of international governance to satisfactorily respond to global challenges like climate change' ([52], p. 2). Innovative DCG approaches are needed for complex international issues of this nature. A number of governance systems have been proposed in response to this need, one of which is increased democratisation of global governance through deliberative democracy ([52], p. 2)—in other words, global DCG.

There have been notable attempts at global deliberation on environmental and sustainability issues that involved ordinary citizens. In 2009, the Danish Board of Technology held World Wide Views on Global Warming (WWViews), a deliberative day-long event involving a global mini-public of around

4000 citizens in 38 countries. WWViews aimed to influence governments in nation states as well as actors and organisations likely to be involved in formal and informal discussions under the United Nations Framework Convention on Climate Change ([52], p. 8). The process was considered partially successful, in that participants' deliberations yielded informed, well-considered views, there was considerable media coverage, and it provided valuable lessons to DCG practitioners. However, WWViews had very little observable impact on climate policy, particularly on the outcomes of COP 15, at which it was directed [22,52]. This failure was thought to be due to the weak connections to government institutions, resulting in a lack of political accountability, and a failure to understand the mechanisms by which the politicians, negotiators and interest groups interacted within the boundaries of COP15. One factor was that many of those at COP15 were already bound to adhere to the mandate given to them by those they were representing, developed before WWViews took place.

Another challenge associated with global forms of DCG is that of ensuring that participating citizens are representative of the 'global community'. The organisers of WWViews recruited a representative group of nations, and asked each of them to provide a representative sample of their own national communities, a strategy that was in line with the UN approach to bringing nations together, and was deemed to be reasonably successful. However there were gaps in representation, such as lack of participation from Middle Eastern or Central Asian countries. In addition single events in individual countries did not necessarily do justice to the size of the different populations. For example 'China's population of more than 1.3 billion and St Lucia's population of 170,000 were both represented by a single event, giving the views of St Lucians disproportionate weight when the global results were aggregated' ([52], p. 17). A remedy for this could be to try to achieve inclusion in terms of diversity of views or discourses instead of, or as well as, demographics in global instances of DCG, and perhaps to bring participants from different countries together online to deliberate [52,53].

Governance can also be driven from the grassroots, especially when the focus is on a specific geographical location. In 'place-based collaborations', community members and stakeholders may collaborate to solve problems without the involvement of government. For example, in the U.S., the Toiyabe Wetland [54] and Watershed Management Team consisting of farmers and environmentalists sought a way to deal with a contentious policy issue relating to the management of private and publicly owned land. At the invitation of a farmer, the group ran trials on his ranch to evaluate the effect of livestock on the land. Eventually they reached consensus about how to manage the land to achieve both farming and conservation goals. The management plan the group devised was implemented successfully, and demonstrated that the appropriate use of cattle on either publically or privately owned land could be beneficial from an environmental management perspective, an outcome that was highly relevant to others in similar situations. This collaborative group was 'literally "grassroots" and "organic" in its origins' ([32], p. 2). Kemmis and McKinney characterise this form of grassroots-driven collaboration to address environmental issues as an 'ecology of democracy' and argue that it represents an 'important but still-emerging form of democracy' ([32], p. 2).

Another example of this form of collaboration from the early 1990s is the Beaverhead-Deerlodge Partnership. In this case, loggers, environmentalists, citizens and officials from the local government collaborated to develop a five year management plan that would conserve the local forests while ensuring the long term viability of the local sawmills. The partnership was created because the management plan previously devised by the government was regarded by all community groups as

inadequate. Despite resistance from the government department that had devised the original forest management plan, the Partnership succeeding in getting their bill passed by Congress through the support of its congressional delegation ([32], p. 6). These case studies illustrate that DCG can be, and indeed should sometimes be, more than a government-initiated or co-created decision making process. Kemmis and McKinney assert that ‘at least in the public lands arena, collaboration would never have been widely employed by agencies, let alone mandated by legislative bodies, had it not initially emerged in an utterly organic, non-directed way and if it had not proven its viability on the challenging political landscape that produced it’ ([32], p. 7).

It is difficult to ascertain how often informal DCG events of this sort occur, or how deliberative and effective they are. They may be private. Official records may not be kept. Outside parties may not conduct evaluations. Additional research on informal DCG is needed to ascertain how it may connect with or inform official governance processes. Moreover, the effect of digital means of technology on generating and maintain grassroots DCG warrants investigation. Analysts have already noted the unprecedented erosion of state sovereignty brought about by technology-enabled connections between global citizens [50].

It is important to consider as well the relative merits of partisan *versus* non-partisan forms of DCG, and of stakeholder *versus* citizen participants. Hendriks *et al.*, for example, argue that ‘non-partisan forums...rate favourably in deliberative capacity, but can fall short when it comes to external legitimacy and policy impact. Contrary to expectations, partisan forums can also encounter substantial legitimation and impact problems’ ([55], p. 362). The authors note the tension between the reluctance of partisans to give up their positions to deliberate, and the fact that, because legitimacy in deliberative democracy ‘exists to the extent that those subject to a collective decision have the right, opportunity and capacity to contribute’, partisans are central to deliberative democracy ([55], p. 362). Recognising this, some DCG efforts have attempted to involve both partisans and non-partisans in their deliberations in order to have a better chance to achieve legitimacy and influence. For example, many of the deliberative processes initiated by the Minister for Planning and Infrastructure in Western Australia had elements of both partisan and non-partisan deliberation [39].

4. The Influence of Context on Deliberative Collaborative Governance

The political context in which deliberative collaborative governance is developed and implemented influences its form and success [4], and as such has influenced the emergence and implementation of the categories of DCG presented in our typology. For instance, there is evidence to suggest that comparatively unstable political contexts tend to provide space for more radical iterations of DCG involving transformations of conventional government processes, while in areas of relative political stability DCG may be more readily implemented to complement existing government processes, in order to better inform government decision making. However, this hypothesis needs further testing since very little analysis of ‘the strategic and political settings of dialogue and deliberation processes’ of DCG has been undertaken ([27], p. 2). Given the potential threat of social and political upheaval in our cities resulting from continuing unsustainable practices, this is an important aspect of DCG to understand. It may transpire that, if we can avoid destructive conflict as we adjust to new economic,

social, demographic, and climatological realities, DCG may be as much a product of unsustainability as it is a remedy.

In South Korea, the fundamental political change of moving from an authoritarian regime to a democratic one provided an opportunity to move toward a more inclusive and deliberative practice of strong democracy at a time when people expected and wanted radical political transformation [56]. In Brazil, dramatic political change also preceded participatory budgeting. The end of authoritarianism and the election of the Workers Party saw the rise of civic associations that could support PB and brought about a new Constitution that stipulated participation by citizens. The new constitution required the participation of civic associations in the development of policy for the city, health, and social security ([21], p. 623).

Analysis of the influence of Porto Alegre's socio-political history on the development of PB, suggests that 'the presence of civic associations is linked to the deliberative and distributive results of participatory budgeting and that these conditions may not be present in other participatory budgeting experiences' ([21], p. 623). This implies that local socio-political and historical circumstances may be so critical to the success of DCG that it cannot be copied from one jurisdiction for use in another without potentially significant changes to reflect the context. This could explain why in western countries such as Canada and Europe, where there are long-standing, stable governance systems, many forays into PB have been less radical than in newer democracies ([45], p. 108). For instance, Maley argues that Canadian Alternative Budgets (ABs) are 'weak reflections of the radical imagination...exercises that are not yet autonomous from the neoliberal state' ([45], p. 107). Pateman suggests that perhaps participatory processes such as PB tend to be implemented in rich countries to 'bolster the legitimacy of the present system' and in poor countries to 'help improve governance' ([21], p. 15).

The DCG initiatives undertaken in Western Australia by Minister MacTiernan rested within the legislative boundaries of existing, relatively stable government processes. However, the Minister's initial experiences with deliberative democracy within her own jurisdiction gave her confidence that given the right opportunity, citizens can understand complexity, are able and prepared to make trade-offs, and can take complexity into account appropriately when formulating their recommendations. This led her then to *effectively* hand over decision making to the participants of some subsequent deliberative initiatives, in an effort to improve Western Australia's relatively stable democratic processes.

In other cases, grassroots DCG has emerged "organically" when government has failed to deal with an issue satisfactorily; when government policy is deficient or irrelevant; or when state-supported governance is limited or non-existent. As noted, there have been many instances in which stakeholders have instigated DCG processes to make up for dysfunctional government processes [25], particularly where participants face a 'mutually unsatisfactory status quo' ([55], p. 377).

5. Institutionalizing and Enhancing Deliberative Collaborative Governance

While DCG that emerges beyond or outside conventional government processes (the third category in our typology) is a critical source of action and innovation warranting further investigation, many also see institutionalisation of DCG within government as essential to the achievement of sustainability, and for stronger democracy in general. However, despite the need to address sustainability issues in integrated ways, governments frequently undertake deliberative collaborative

governance on an ad hoc basis at the discretion of public officials. Pateman argues that the conventional institutions of democracy must be subject to structural change if they are to support participatory democracy adequately, and criticises the lack of integration of deliberative democracy initiatives into the ‘regular political cycle in the life of a community’ ([20], p. 10). Carolyn Lukensmeyer, the President and Founder of AmericaSpeaks, argues that ‘the way the public’s business is done needs to become more inclusive and participatory as standard practice, especially at the national level. Only by institutionalising these practices will we rebuild trust in our governing institutions and transform what it means to be a democracy’ ([57], p. 231).

Similarly, in our view, what we have termed deliberative collaborative governance should be institutionalised in those instances in which government is playing a leading role. Just as democracy should be embedded in community life, rather than being confined to voting and lobbying, DCG practices should be embedded in institutional governance, transforming the structure of democratic institutions in the process. There are cases where DCG has been institutionalised with good results, such as participatory budgeting in Brazil. However, we believe that the road to integration may first require implementation of less ambitious forms of DCG that serve as a means of learning-by-doing that improves the understanding and practice of DCG and makes manifest its merits.

Of course, institutionalisation of DCG for dealing with sustainability issues may be difficult or even impossible to achieve. As we have noted, the lack of international institutions of governance with influence supported by legislation works against institutionalisation of international DCG for climate change, poverty alleviation, and other sustainability issues. Moreover, as Chester and Moomaw observe, ‘state sovereignty no longer constitutes the only pillar supporting “international world order”... [a fact that] holds particular relevance in regard to how we respond to the expanding number of global environmental threats’ ([50], p. 192). Cities’ responses to global sustainability challenges cannot be entirely effective in isolation—they are buffeted by the workings of the global political economy, and must therefore find ways of connecting with global systems using DCG.

At the other end of the scale, Kemmis and McKinney ([32], p. 12) put forward sound arguments against constraining grassroots place-based ‘collaborative democracy’, so important to sustainability, through institutionalisation. They suggest that institutionalisation might put its ‘organic’ nature—the source of its strength and innovation—at risk, particularly since collaborative democracy initiatives have ‘emerged in response to a relatively dysfunctional decision-making framework’ ([32], p. 12). Instead, ‘we should pay attention to the ways in which this emergent phenomenon is manifesting its life-giving adaptiveness’ ([32], p. 12). Overlaid with the imperatives of sustainability, this form of DCG may enrich conversations about the meaning of democracy that theorists such as Pateman [20] contend must occur if participatory democracy is to flourish.

6. Conclusions

Efforts to devise and implement effective responses to wicked problems are constrained by the fact that the existing civic and governmental institutions are inadequate for the task. The disconnections between our silo’d institutions and the lack of collaboration between the community, government, non-government organizations, and the private sector continues to be a major barrier to building sustainable cities and countries. However, there are notable examples across the globe of decision

making authority being shared among diverse stakeholders that have led to more sustainable outcomes. This is our focus.

We use the term ‘Deliberative Collaborative Governance’ (DCG) to capture how shared responsibility, authority, and power, coupled with a pragmatic, problem-solving orientation to wicked problems that emphasises deliberative analysis, fact-finding, and policy evaluation can move communities towards resilience and future sustainability. In a notable example, the experience of Participatory Budgeting across the globe has clearly shown that where PBs are co-decisional, they are far more likely to survive both national and global ructions than those that are only consultative (where power remains with state institutions).

Our rudimentary typology of DCG posits that elements of deliberative collaborative governance are emerging across the globe in a range of political and sociocultural contexts. Furthermore, we suggest that DCG—which hybridizes deliberative democracy and collaborative governance—can contribute significantly to the achievement of sustainable outcomes.

It is likely that innumerable initiatives that have gone under the radar of this typology, therefore it is expected that the typology will continue to be developed. Currently the typology posits three groupings that are not mutually exclusive but may lead to or merge into one another:

- (a) legitimising and better informing government decision-making, thereby rendering policies more effective and reinforcing government’s legitimacy as the institutional expression of democratic political authority;
- (b) altering existing government decision-making outcomes, processes, or structures;
- (c) accomplishing goals outside of or independently of official government processes, which may be unavailable, ill-suited, not authorised, inefficient, ineffective, or not congenial for the purpose.

Importantly, the typology can help us to better understand how DCG can help to achieve sustainability. On one hand, we will be able to better understand whether the type of DCG undertaken affects the quality (such as effectiveness and durability) of the decision making outcome (such as policy and action for sustainability that is approved and implemented). On the other hand, we can learn about the contexts in which DCG may emerge and perhaps take root, and conversely, the degree to which DCG may influence context. This typology can be used both prospectively and retrospectively to achieve these aims. For instance, DCG process designers can consider which of the categories within the typology are most appropriate within a given system context they are dealing with, and which are most likely to achieve real outcomes (including transforming the system context in the longer term). Retrospectively, the typology provides a basis from which to evaluate the effectiveness of different modes of DCG in achieving sustainability outcomes. The typology can also be used to evaluate DCG processes to see how closely they conform to designers’ intentions, and what factors influence this. For instance, the original intention may have been for government to retain responsibility for decision making. However if government decision makers associated with the DCG being undertaken are impressed with the quality of the deliberative process, they may be moved to effectively or officially hand decision making over to participants at some stage during proceedings. It is vitally important to understand such shifts in democratic governance processes, particularly in terms of their effectiveness in achieving sustainability outcomes.

In further developing this typology, research is needed on how context influences the form, purpose and effect of DCG; the extent to which context influences DCG; and whether DCG catalyzes changes in the broader sociocultural and political context in which it is practiced.

Conflict of Interest

The authors declare no conflict of interest.

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35. This definition is likely to evolve with suggestions from collaborators during the next phase of our work, in which we plan to use crowd-sourcing to link collaborative researchers and practitioners in an online deliberative space.
36. This subcategory has been included in the DCG typology, since it can be deliberative and collaborative. However it tends to involve stakeholder groups and not citizens, which on the surface does not fit well with our assertion that citizen participation is essential to DCG. Nonetheless, this sort of collaboration has the potential to incorporate citizen participation to a greater extent, and can also link to broader processes that are more orientated towards citizen involvement, making an important contribution in the process. Therefore it has been included in the typology at this point.
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