How can we drive sustainability transitions?

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ABSTRACT

Sustainability transitions are required to address challenges of climate change, economic development, ecological integrity, and social justice. Driving sustainability transitions is difficult but necessary work. We discuss sustainability challenges and the need for transitions, with a focus on the vital roles that change agents can play. These change agents exhibit a desire to make change happen. They encourage others to join them in their efforts. After discussing the work of change agents in driving sustainability transitions, we present a case study of change in Perth, Australia, where change agents have attained considerable success in placing that city on a path toward sustainable water management practices. We suggest sustainability transitions can be effectively enabled when change agents: (1) Clarify the problem and articulate a clear vision; (2) Engage others to identify workable solutions and implementation pathways; (3) Secure support from influential stakeholders; (4) Establish effective monitoring tools and learning systems; (5) Foster long-term relationships of trust and mutual support; and (6) Develop narratives that support ongoing action.

1. Introduction

The need for sustainable development on a global scale has become increasingly salient in public discussions during the past decade. Around the globe, cities, towns, and rural areas are facing immense sustainability challenges. These have been caused by the start of climate change impacts, resource depletion, population growth, environmental degradation, and aging infrastructure. Traditional, business-as-usual approaches to how governments coordinate collective action for positive social, economic, and environmental outcomes appear insufficient to address these challenges. Sustainability transitions are intended to address interconnected challenges. They call for fundamental reconfigurations of the cultures, institutions, policies, regulations, funding models, and routines that create the systems and engagements that shape our everyday lives.
But what does it take to achieve sustainability transitions? Innovation through local experiments and demonstrations is recognized as an important seed for system change (Geels and Raven 2006; Nevens, et al. 2013). Much less is known about how we might replicate and scale up local innovations to promote broader transitions (DeSantola and Gulati 2017; O’Reilly and Binns 2019; Raven, Schot, and Berkhout 2012). At the current time, citizens and their political representatives know change is needed. But too often, this knowledge does not translate into necessary action. In our view, this situation is not purely the result of apathy or self-interested support for the status quo. Lack of meaningful action can also be attributed to the sheer magnitude of the tasks confronting us.

What is to be done? We suggest that leadership is fundamental to driving change. Leadership has long been acknowledged as an essential driver of both local innovation and broader system transformation (Mohr 1969; Mintrom 1997; Taylor et al. 2011). Yet precisely how this necessary leadership is exercised is not well understood. Many people currently in positions where they could drive sustainability transitions have limited knowledge of the actions they must take to replicate and scale local innovations into broader transitions. Here, we combine scholarly knowledge and practical experience with the goal of helping to close that knowledge gap.

Throughout this article, we emphasize the role that change agents can play in promoting sustainability transitions. The term is left deliberately broad. Change agents can be found across society. They may be elected politicians, government officials, interest group leaders, members of community groups, or representatives of industries. They exhibit an instinct for collaboration. Positional power – as attained by serving in formal leadership positions such as the head of a corporation, the mayor of a city, or the governor of a state – naturally gives certain people a platform for influence. However, to drive significant change in complex settings, collaborative capabilities become more important than positional power. For example, to drive a transition that will result in sustainable water management within a given jurisdiction, coordinated actions must be taken by people across water, planning, development, and environment organizations, often with the involvement of multiple levels of government. This means that change agents need to find novel ways to lead and organize others so that the necessary coordination and collaboration will occur. Ultimately, change happens when coalitions of actors are motivated to pursue it. Therefore, those who self-identify as change agents must strike upon effective ways to work with others to secure change. Given the inherently complex operating contexts of contemporary business and government – characterized by intersecting governance arrangements, multiple political and social processes, and the need to manage major infrastructure systems – all effective change agents are leaders of teams and coalitions, not lone heroes.

In what follows, we first discuss the role that change agents can play in driving significant moves beyond status quo activities. In doing so, we draw on insights from the literature on sustainability transitions as well as the literature on policy change. This leads us to specify six key actions that can drive change. After our review of relevant literature, we present a case study of water transition in Perth, Australia. This initiative,
which has gained significant momentum through dedicated efforts by change agents since 2015, has placed the city on a path toward more sustainable water management practices in the decades ahead. We conclude this article by suggesting that learning from experience is a central component of the leadership practices that are required to drive sustainability transitions.

2. Change agents and transition dynamics

Driving sustainability transitions looms as a necessary task for current and emerging cohorts of policymakers and public managers around the world. Doing so calls for a great deal of leadership capability. That capability must be embedded in effective teams whose members are able to rapidly tap the resources, knowledge, and networks of other relevant entities. Our knowledge of what change agents might do to support sustainability transitions can be usefully informed by two streams of literature: (1) emerging studies of actors leading such transitions and (2) the growing body of knowledge concerning policy entrepreneurs and other entrepreneurial actors working in and around government to make change happen. Based on contributions to this literature, we suggest sustainability transitions can be effectively enabled when change agents take six actions, which we articulate below and then discuss in more detail in our case study of a sustainability transition effort in Perth, Australia.

Emerging studies of actors leading sustainability transitions have examined how change agents have tapped into institutional enabling processes to drive change (see, e.g. Fazey et al. 2018). Among other things, these studies have noted the importance of a small group of loosely connected frontrunners from across government, private, community, and scientific sectors who, through a mix of creating and disrupting institutional strategies, have managed to facilitate growing and diverse actor-networks to take transitions in desired directions (Brown, Farrelly, and Loorbach 2013.) Related work has examined the mixture of strategies employed by various urban actors promoting sustainability transitions. Among other things, different change agents might balance confrontation with cooperation to “co-produce governance innovations” and drive the long-term societal changes needed to facilitate transitions (Novalia et al. 2020). Additional work in this set of emerging studies has considered “champion-driven leadership processes” in which change agents appear to deliberately employ distinctive strategies for promoting transitions depending on the evolution of a specific transition process (Taylor et al. 2011). Such research reveals that change agent strategies should always be chosen to take careful account of the operating context. Sometimes distributed leadership might make sense – that is, where leadership does not sit with one specific individual or a close-knit team, but is spread across an organization or broader community of practice (Bolden 2011). At other times, strategy needs to be driven by a team of champions who are closely and continuously calibrating their efforts. The notion that change agents play different “roles” in transitions can be helpful, because roles ascribe capabilities to agents, with the nature of those capabilities being determined by context (Wittmayer et al. 2017). These emerging studies of change agents leading sustainability transitions have also highlighted that different jurisdictions and
localities will exhibit different levels of “transformative capacity” (Castán Broto et al. 2019). This can have major implications for strategies applied by change agents.

These insights on change agents and transitional dynamics can be usefully augmented by insights from the literature on policy entrepreneurship. That literature initially focused on agenda setting (Kingdon 1984/2011), but soon expanded to explain how these actors secure policy change, while taking account of both enabling and inhibiting contextual factors (Mintrom 1997). Subsequent research has identified how policy entrepreneurs can drive change at various points in the policymaking process, including during implementation (Cohen 2021; Mintrom 2019). Thus, there is much that we can learn about driving sustainability transitions from this growing body of knowledge about policy entrepreneurship (Frisch Aviram, Cohen, and Beeri 2020; Meijerink and Huitema 2010). Among other things, we should note the importance of problem framing and narrative construction (Mintrom and Luetjens 2017; Mintrom and O’Connor 2020), of using evidence and arguments to engage with and augment existing advocacy coalitions to drive change (Mintrom and Vergari 1996), and of establishing effective teams of policy entrepreneurs (Mintrom, Salisbury, and Luetjens 2014; Tang, Cheng, and Cai 2020). Teams can be especially effective when some members are experienced system insiders, well-versed in managing political processes, while others in the same team are well-versed in community activism and how to build pressure for change from the outside (Roberts and King 1991). Policy entrepreneurs also tap various networks to gain support, recognizing that relevant knowledge, skills, and experience are best secured through expert use of “weak ties” with other individuals and entities operating in the context where change is being pursued (Arnold, Nguyen Long, and Madeline Gottlieb 2017; Mintrom and Vergari 1998). Often, they are construed as boundary-spanners – individuals who “contribute to effective inter-organizational behaviour” (Williams 2002; see also Faling et al. 2019). Finally, when policy entrepreneurs look ahead to implementation, they also gain the capability to interpret where potential challenges could occur and how they might use their resources and their connections to surmount those challenges (Lu et al. 2020; Mintrom and Thomas 2018).

3. Six key actions for driving sustainability transitions

From the existing studies of actors leading sustainability transitions and the growing body of knowledge concerning policy entrepreneurship referenced above, we suggest change agents pursuing sustainability transitions should take six key actions. These actions need not be sequenced in the order that this list would imply. Indeed, we anticipate that several of these actions will overlap, will be undertaken simultaneously with one another, and may be on-going – not one-off interventions with clearly defined start- and end-points.

1. **Clarify the problem and articulate a shared vision.** How problems are framed conveys why they are important and guides people to focus on specific solutions.
2. **Engage others to identify workable solutions and implementation pathways.** Bringing others into discussions of a problem is critical for exploring how it might be addressed.
3. Secure support from influential stakeholders. Transitions can only occur when a significant number of people with the necessary capabilities believe their actions can make a difference.

4. Establish effective monitoring tools and learning systems. Monitoring tools can help change agents track progress and can provide rapid feedback to guide on-going actions.

5. Foster long-term relationships of trust and mutual support. Trust and mutual support among change agents and stakeholders are vital given the significant moves from the status quo that are embodied in sustainability transitions.

6. Develop narratives that support on-going action. Transition narratives, supported by careful documentation, can keep coalitions focused on the outcomes they are seeking and the actions they must take to achieve them.

Change agents who deliberately and systematically engage in these six key actions are likely to find more success in pursuit of sustainability transitions than those who do not. Clarifying the problem is a vital step for engaging others. Once others are engaged, it becomes possible to more readily identify workable solutions and implementation pathways. A shared vision of how to address the problem effectively can then emerge from these various conversations. The effort to articulate a shared vision and specify workable solutions can clear the ground for securing support from influential stakeholders. Indeed, articulation of the shared vision and the sense of what solutions will work provide clarity around what stakeholders are likely to be most important to pursuit of the transition. Efforts can then be made to identify within that set of stakeholders the subset likely to have the capabilities and influence skills needed to drive change. Any change effort must be supported by monitoring tools. Monitoring tools help change agents track progress. At their best, they provide rapid feedback that can be used to calibrate on-going actions. Such tools can prompt new discussions and facilitate learning. The development of report cards and other means of showing progress over time can help keep a coalition of supporters goal-oriented and engaged. This is especially important, given that transitions often take years and even decades to achieve. Information acquired from monitoring tools can also support the development of long-term relationships of trust and mutual support among stakeholders, keeping the broader coalition cohesive and effective. Conversations concerning what are working and how to achieve next steps can greatly enable trust among diverse actors. Relatedly, efforts to construct narratives about the transition process are also vital. Transition narratives, supported by careful documentation, can ensure that coalition members remain focused on the outcomes they are seeking and the actions they must take to achieve them. Factors such as changes in key personal in organizational leadership position or the emergence of unexpected challenges can be destabilizing for those driving transitions. Shared narratives – consciously developed and maintained – can do a lot to keep the coalitions functional and focused.

We next discuss these key actions for driving sustainability transitions with reference to Perth’s transition toward more sustainable water management practices. This provides a useful way to illustrate the practical importance of these six actions within a live context.
4. A case study of sustainability transition in Perth, Australia

Many jurisdictions are now grappling with the pursuit of sustainability transitions of various kinds. Indeed, the United Nation’s Sustainable Development Goals and the Millennium Development Goals which proceeded them have done much to prompt the pursuit of sustainability. In addition, the long-standing annual meetings of the Conference of the Parties (COP) provide another means by which jurisdictions around the world have come to pay more heed to transitioning to sustainable practices – from the super-national level (like the European Union) through to the national and sub-national levels. Given that, we could have chosen any number of cases to use to illustrate the practical application of the six key actions that can drive sustainability transitions (see, e.g. the multi-case work of Meijerink and Huitema 2010). We selected to focus on Perth, Australia’s transition toward its water-sensitive city vision. We did so for three reasons. First, as we explain below, this is an acute case where a sustainability transition is essential to the city’s survival as a livable city. Second, the Perth case has been well-documented, as noted below. Third, we have been closely involved in both the activities associated with making the transition happen and with documenting it. That involvement has given us unique insider knowledge of the transition process in Perth. That knowledge has also given us the confidence to draw explicit connections between the Perth case and insights from emerging studies of actors leading sustainability transitions and the growing body of knowledge on policy entrepreneurship.

Water servicing within cities has traditionally focused on meeting the sustenance, health, and safety needs of society through provision of drinking water, sanitation, and drainage. However, as cities worldwide grapple with major challenges, such as increasing population size, intensified urbanization, and climate change, there is a growing emphasis on the importance of water system services in enhancing a city’s livability, sustainability, and resilience (Wong, Rogers, and Brown 2020). This notion involves realigning conventional water services provision by transitioning toward a more water-sensitive approach, including integrated management of the whole water cycle, consideration of water systems as an integral part of the urban landscape, and engagement with citizens as active stewards of a city’s water resources and environments (Wong and Brown 2009). Sustainability transitions of this kind call for substantial shifts in attitudes and practices among a range of stakeholders including community groups, government, and industry.

4.1. Clarifying the problem and articulating a shared vision

Perth, with a current population of approximately 2 million people, is one of the world’s cities most impacted by climate-induced water scarcity. The city has seen average streamflow into dams reduce by around 80% since the mid-1970s. The city’s climate is continuing to become hotter and drier. At the same time, urban development and the demand for water are continuing to grow. Planning is under way to accommodate an anticipated 3.5 million people by 2050. That planned population growth of over 75% from the present will require further urban expansion and intensification. A
The key challenge for Perth is how to create and maintain highly livable communities when natural water sources continue to decline.

To place Perth onto a more sustainable trajectory in water management, in 2015 the Cooperative Research Center for Water Sensitive Cities (CRCWSC) began a collaboration with key local stakeholders (Hammer, Rogers, and Chesterfield 2018). The resulting activities illustrate the shifts from business-as-usual practices that are required to get sustainability transitions started.

### 4.2. Engaging others to identify workable solutions and implementation pathways

While the CRCWSC activities in Perth were catalysts for change, actions on the ground rapidly led to the creation of a powerful, diverse, and motivated team of change agents with deep roots in Perth’s system of water governance and management. The Perth collaboration has catalyzed change by following a number of key steps. In its first year of activities, six workshops were held where stakeholders were invited to discuss the current situation with respect to the city’s water management, to work together on development of a shared future vision for a water sensitive city, and to develop a plan of actions to support a transition process. Workshop insights were incorporated into a transition planning process methodology, which blended local knowledge with knowledge from transitions in other settings (Rogers et al. 2015). Soon after these workshops were concluded, stakeholders were introduced to the Water Sensitive Cities Index. This is a tool for benchmarking and diagnosing a city’s water-sensitive performance (Rogers et al. 2020). The tool allowed stakeholders in Perth to place their local context in comparative perspective and to more readily learn about effective strategies for attaining sustainable water management arrangements for their city.

### 4.3. Securing support from influential stakeholders

In their second year of activities, the Perth change agents worked to form a strategic network of leaders from 26 stakeholder organizations spanning state and local government, research, private industry, and community sectors. This network – the Water Sensitive Transition Network – was formed to guide Perth’s transition toward a water-sensitive city. The network has subsequently grown into a cross-sector community of practice. Partners are united through their commitment, goodwill, and shared vision for a sustainable, highly livable city. The Network has an operating charter and, due to the scope, scale, and complex nature of work required to transition Perth to a water-sensitive city, the Network established four subcommittees to enhance opportunities for collaboration and delivery. These focus on: (1) Community Engagement and Communication, (2) Policy and Governance, (3) Technical Capacity and Partnerships, and (4) Research (Water Sensitive Transition Network 2019). These subcommittees meet regularly and have developed their own work programs to support new ideas, seek new opportunities, work constructively through challenges, and share their lessons with others. The Water Sensitive Transition Network has also worked with the
CRCWSC to document its 2065 vision of Greater Perth as a water-sensitive city and to outline its transition strategy (Hammer, Rogers, and Chesterfield 2018).

4.4. Establish effective monitoring tools and learning systems

Effective use of technology can support change efforts, including sustainability transitions. The Water Sensitive Cities Index (Rogers et al. 2020) has allowed change agents in Perth to benchmark their water management arrangements and set a baseline of where they are at compared with where they would like to be. Perth also has made strides in the tools and instruments space, with policies and guidelines, such as Livable Neighborhoods and Better Urban Water Management articulating water-sensitive outcomes. Such monitoring tools can help change agents track progress. At their best, they provide rapid feedback that can be used to calibrate on-going actions. A recent reassessment of Perth’s water-sensitive city status using the Water Sensitive Cities Index suggests significant advances have occurred since the city’s collaborative work began (Riethmuller et al. 2021). Among other things, the collaborations have nurtured the emergence of a strong network of change agents. With the focus clearly on driving the transition, these change agents meet regularly to discuss ideas and share knowledge. Key agencies, such as the Department of Water and Environmental Regulation (DWER), the Water Corporation and the Department of Planning, Lands, and Heritage are now championing the water-sensitive city agenda and incorporating it into organizational policies, strategies, and programs. There have also been significant advances in the building of knowledge and the creation of key projects, with several water-sensitive city solutions being demonstrated at a large scale (Riethmuller et al. 2021). For example, the Groundwater Replenishment Scheme presents a technical solution to water supply that is now being implemented at a large scale and supported by the community. The Water Corporation and DWER’s Drainage for Livability program is an example of a governance solution to improve drainage and water management while increasing urban livability. The Water Corporation and DWER’s Waterwise Councils Program is also an example of a large-scale governance solution designed to support Councils in their collaborative efforts to improve local water sensitivity. Embedding the full range of water-sensitive city solutions in projects, administrative tools, and practice tools will be an important focus in Perth going forward.

4.5. Foster long-term relationships of trust and mutual support

Effective use of technology is a vital enabler of well-directed collective action. But it must be supported by effective efforts to foster trust and mutual support among key stakeholders. Perth’s transition toward its water-sensitive city vision, like transitions elsewhere, will require significant changes across the structures, cultures, and practices of urban and water system planning and management. These changes are likely to happen over a lengthy time frame (Luederitz et al. 2017). But the activities to date and the achievements of the Water Sensitive Transition Network indicate that Perth is now on a positive trajectory toward becoming a water-sensitive city. Part of the challenge involves nurturing trust and mutual support among a diversity of actors. Clear
communications, enabled by monitoring tools and effective learning systems can greatly support efforts to nurture trusting, supporting relationships among professionals.

4.6. Developing narratives that support on-going action

In Perth, deliberate efforts have been made from the outset to construct a clear and persuasive narrative around the water-sensitive transition process. This can be seen in the naming of documents, such as the 2015 report on development of a strategic framework, *Shaping Perth as a water-sensitive city: Outcomes and perspectives from a participatory process to develop a strategic transition framework* (Rogers et al. 2015). The subsequent vision document and implementation plan each reinforced the framing of Perth as a water-sensitive city (see Hammer, Rogers, and Chesterfield 2018; Water Sensitive Transition Network 2019). While Perth has a long way to go to become a fully water-sensitive city, a lot has already been achieved. Consequently, a shared narrative about Perth and water management has emerged (Riethmuller et al. 2021). Shared narratives like this can help to build support around a shared vision. But they can do more than that. Narratives evolve to continually assist stakeholders to make sense of the path they are on, their achievements to date, and how they have overcome difficulties along the way (Mintrom and O’Connor 2020). They can also help to maintain a cohesive coalition of change agents and ensure influential stakeholders keep focused on the attainment of intended outcomes.

This case study highlights how change agents in Perth have been pursuing an ambitious and complex sustainability transition. From the outset, careful efforts have been made to clarify the problem and engage others in the pursuit of change. With others engaged, it has become possible to identify workable solutions and implementation pathways. From these initial actions, a shared vision for Perth has emerged. That has cleared the ground for securing support from influential stakeholders. Various monitoring tools and mechanisms are in place in Perth to track progress. These are helping to calibrate on-going actions. Information acquired from monitoring tools is also assisting in the creation of long-term relationships of trust and mutual support among stakeholders. A clear narrative concerning Perth’s transition process has also been carefully nurtured. Going forward, that narrative, supported by on-going monitoring and documentation of progress, is expected to keep the change coalition focused on the intended outcomes for Perth and the actions needed to achieve them.

5. Conclusion

Driving sustainability transitions looms as a necessary task for current and emerging cohorts of policymakers and public managers around the world. Doing so calls for a great deal of leadership capability. That capability must be embedded in effective teams whose members are able to rapidly tap the resources, knowledge, and networks of other relevant entities. Our intention here has been to inspire policy designers and public managers at all levels of government around the world to think in practical terms about what actions they can take to both drive and support sustainability transitions.
We have suggested that sustainability transitions can be effectively enabled when change agents: (1) Clarify the problem and articulate a clear vision; (2) Engage others to identify workable solutions and implementation pathways; (3) Secure support from influential stakeholders; (4) Establish effective monitoring tools and learning systems; (5) Foster long-term relationships of trust and mutual support; and (6) Develop narratives that support on-going action.

We have also sought here to inspire more researchers in the fields of public policy, public management, and sustainable development to conduct new investigations of transitional dynamics. Everywhere in the world, at every level of government, opportunities exist to promote sustainability transitions. As our evidence from Perth, Australia has illustrated, working and learning together, practitioners and researchers face myriad opportunities to clarify, document, and disseminate further insight on what actions are needed to drive successful sustainability transitions. We would like to see, as a matter of urgency, more research conducted on change agents and how they can drive sustainability transitions.

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