Chapter 10

Implementing Solutions Based on Collaborative Adaptation

Abstract

This chapter examines how implementation of SDG solutions can be improved through adaptive strategies. Many so-called blueprint strategies are inflexible during implementation and underestimate the importance fitting general goals and plans to shifting local needs and contexts. The chapter emphasizes the importance of identifying the specific types of dynamic challenges that will prompt the need for adaptation when implementing sustainability strategies. Adaptive cocreation provides a valuable framework for overcoming traps of various sorts that may block implementation. The problem-driven iterative adaptation (PDIA) model is introduced as one approach to adaptation. PDIA is particularly valuable for achieving bottom-up integration of SDGs and projects. Finally, the chapter considers the importance of social learning as a strategy for collaborative adaptation.

Keywords: Implementation; blueprint strategies; adaptive strategies; problem-driven iterative adaptation; social learning; cocreation workshops

Collaborative Adaptation as an Implementation Strategy

The world rarely sits still as we go about the business of trying to implement sustainability solutions. New solutions must be adapted to changing conditions on the ground, as well as to new and unforeseen problems and events. New stakeholders appear at different stages of the implementation process, and new political roadblocks may materialize, calling for proactive countermeasures. Evaluation of implementation can lead to new knowledge that must be incorporated into the conduct of programs and projects. In addition, because no country can claim to be sustainable, the world community must collectively learn

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from the solution designs developed and implemented in different places. As the world changes, sustainability strategies must adapt.

Collaboration and cocreation can support adaptation during the perilous process of implementation. Consider Alianza Shire, a transnational partnership that has sought to develop energy solutions for a large group of refugees in northern Ethiopia. The partnership utilizes a cocreation approach to develop innovative strategies that meet the needs of both refugees and the host country. As the project has scaled up, the number of participating groups has increased, and Alianza Shire's own management structure has become more complex and has created more demands on participants. Luckily, trust among the partners has also grown over time, and the partnership's capacity to sponsor and facilitate experimentation has increased. In part, this is due to the emphasis the partnership placed on iterative adaptation over time, with a focus on continuous improvement and scaling (Moreno-Serna et al., 2020).

This chapter investigates some of the ways that adaptation can be incorporated into sustainability strategies, particularly during the implementation phase.

From Blueprints to Adaptive Cocreation

Recent evaluations of development practices suggest that "blueprint" strategies – where global strategies are uniformly implemented at the local level in a top-down fashion – often produce disappointing results (Andrews, 2013). Blueprint strategies that assume that one-size-fits-all underestimate the importance of fitting general goals to local contexts and needs. As described in Chapter 4, cocreation provides a useful framework for adapting promising global strategies to local conditions, allowing SDG strategies to be tailored to local contexts and to the realities of local politics. Adaptation, however, is not simply the act of embedding or aligning global strategies with local needs and realities but also of accommodating and robustly responding to the often uncertain and unpredictable nature of change processes. Blueprints do not easily adapt to the ever-shifting conditions that sustainability projects encounter.

The importance of adaptation in change processes has been widely recognized in research on governance, particularly in studies of the "adaptive management" of natural resources (Chaffin, Gosnell, & Cosens, 2014). However, we need to clearly distinguish the different types of challenges prompting adaption. Therefore, we begin our discussion by parsing the generic challenges that are important to consider in order to be adaptive when implementing sustainability strategies:

Changing environment, situation, or context. Social and natural environments are complex, dynamic, and even turbulent. This dynamism makes it difficult to focus or optimize stable governance strategies, though the surprise and crisis associated with this dynamism may also yield new opportunities.

Changing stage or phase of problem-solving. The classic literature on policy-making distinguishes between the agenda-setting, problem definition, policy-making, and implementation phases of the policy process and suggests that they create quite different challenges for governance. A large-scale example of an

adaptive implementation strategy is provided by the reform of the Indonesian irrigation system (Alaerts, 2020).

Changing management knowledge. The adaptive management model focuses on how to address the limited knowledge and uncertainty resource managers encounter in managing ecosystems (Lee, 1999). This concept of adaptive management suggests that managers not only need to revise and update their understanding about ecosystems as they collect new knowledge, but they also need to monitor their management interventions and adapt them as their knowledge of the ecosystem improves.

Changing social or political character of governance. As studies of collaborative governance and adaptive co-management suggest, the social system of governing itself changes over time. Trust, social learning, political conflicts, and shifting priorities can lead to the strengthening or weakening of social bonds among stakeholders, to transitions in who is involved in governing and to shifting priorities.

Changing externalities related to governing. Attempts to address one governance challenge may spillover to negatively impact other governance efforts or to create new problems, producing resistance or tradeoffs. Spillovers may also be positive and may reveal synergistic opportunities or the possibility of broader change coalitions.

Changing of revealed or downstream constraints. This point is similar to the point about the shifting conditions across different phases of the policymaking cycle. However, it calls attention to the fact that unexpected or unanticipated constraints tend to arise as governance strategies are developed.

While these implementation challenges suggest the need for different kinds of adaptation, a common theme is that adaption calls for greater collaboration among various parties. Successful adaptation to change requires alignment and coordination between different stakeholders and program components, lest chaos ensue. While it may often be possible to achieve alignment and coordination through hierarchy and authority, the sustainability agenda often calls for a highly distributed effort that encompasses many stakeholders who do not report to same higher-level authority. In fact, the existence of many hierarchical authorities – as opposed to one overarching authority – tends to accentuate the fragmentation of governing efforts. Therefore, collaboration tends to emerge as the de facto strategy for achieving alignment and coordination wherever power is distributed and authority is shared.

The character of collaboration needed for effectively carrying through sustainability projects will depend in part upon the types of adaptation challenges that collaborative groups face. Table 10.1 provides a diagnostic to help collaborative groups identity the specific types of adaptation challenges they may face and the implications these challenges may have for acting in both an adaptive and a collaborative fashion. In general, the diagnostic builds on the view that as the need for adaptiveness increases, so does the demand for cocreation.

This diagnostic is designed to help changemakers identify whether and how cocreation might help them to deal with implementation challenges.

Table 10.1. An Adaptive Cocreation Diagnostic.

(1) Is the environment, situation, or context stable or predictable over time? That is, are the conditions for implementation relatively delimited and unchanging in scope? If changing, is the change slow, steady, and predictable?
If yes. Conditions that are stable or that change in a linear or predictable fashion are more amenable to planned or off-the-shelf solutions. Thus, they can often be efficiently and effectively handled through routine administration, though periodic collaborative planning and implementation efforts may still be useful for bringing together relevant resources, enhancing coordination, for aligning relevant and affected stakeholders and for carrying out successful implementation.
If no. Unstable or shifting conditions will tend to frustrate planned or off-the-shelf solutions and to call for flexible and customized governance strategies. The more dynamic the context, the more that effective adaptation requires real-time cocreation and the more "reflect-act" cycles will be needed to effectively respond.

(2) Will the requirements for effective governance remain stable over time as the project, experiment, or program moves from conception to implementation to monitoring and evaluation? Are the financial, technical, and political requisites for successful governance stable and predictable? Are the same stakeholders involved and equally important in particular implementation phases?
If yes. This may mean that there is a stable core team that can draw up a relatively comprehensive plan that will guide the project from beginning to end. This is a highly desirable situation, but success will depend heavily on the quality and commitment of the participants in the core team. The capacity to anticipate the timing of project needs can facilitate the successful transition of projects and programs.
If no. Changing needs may be difficult to anticipate or there may simply be too many balls in the air simultaneously. In this situation, stakeholders must seek to flexibly incorporate new actors and to simultaneously manage multiple demands through cocreation.

(3) Do the key stakeholders have a comprehensive understanding of the issue and its implementation context prior to the intervention? Do they have a fairly solid understanding of how the system will respond to governance interventions? Are systems relatively similar in their behavior from place to place or at different points in time?
If yes. Comprehensive and solid knowledge about a system or about governance interventions makes more routine or expert

Table 10.1. *(Continued)*

administration possible. However, this knowledge may also make it clear *who* needs to be involved in collaboration, *when* and *how*.
If no. Weaker foundational knowledge often implies the value of engaging experts and lay persons in *knowledge cocreation* and also implies the importance of having the adaptive capacity to learn on an ongoing basis from interventions and the ability to flexibly adapt interventions and strategies as new information and learning becomes available.
(4) Are key stakeholders in agreement about the means and ends of governance? Do they share the same values and build on a reservoir of mutual trust and respect?
If yes. Prior agreement, shared values, and trust will allow stakeholders to move more quickly toward operational governance strategies.
If no. Where there is less agreement, value congruence, and trust, cocreation processes must build in opportunities for stakeholders to engage in deeper social learning, particularly early in the cocreation process.
(5) Can key stakeholders anticipate positive or negative externalities or downstream constraints that might arise from governance interventions?
If yes. Anticipation of externalities (positive or negative) or downstream constraints makes it possible to explicitly incorporate these parameters into implementation planning.
If no. When externalities or constraints cannot be easily anticipated, cocreation can build the capacity and flexibility to adapt to them as they arise. In this case, incremental/probing interventions that avoid irreversible decisions are often important, as is the ability of cocreation networks to access diverse resources and negotiate adaptive responses across these networks.

Adaptive Cocreation as a Strategy for Overcoming Barriers to Sustainability

Poverty and unsustainability often assume the character of "traps" – referred to variously as socioecological, capacity, rigidity, poverty, or policy traps. Such traps can block progress by locking in mutually reinforcing suboptimal situations (Boonstra & de Boer, 2014; Carpenter & Brock, 2008; Haider, Boonstra, Peterson, & Schlüter, 2018). To break out of such traps often requires a great deal of collaborative adaptability to address a set of interlocking challenges. First, change efforts often trigger resistance by stakeholders who fear loss from a changing status quo. Second, traps generally imply systems of interacting factors that must

be attacked at a system level. Third, system change often produces surprising results as taken-for-granted factors become disrupted, and unexpected interdependencies are revealed. The ability of collaborative groups to adapt in a timely fashion to emerging resistance, interacting variables, and surprising interdependence is likely to improve the odds of breaking out of suboptimal traps.

When development projects fail, it is often because they apply relatively superficial "best practice" strategies that get distracted by giving priority to form over function (Andrews, Pritchett, & Woolcock, 2013). Often such practices are promoted in an inflexible top-down fashion that can exacerbate the problems of responding to sustainability challenges. Research has found that transnational stakeholder partnerships associated with the SDGs have had weak bottom-up participation (Pattberg & Widerberg, 2016). Moreover, they often do not have clear agendas that can deliver on projects. Improved needs assessment, good process management, and effective monitoring and evaluation are important ingredients of more successful partnerships. Still, these partnerships will remain limited unless they can mobilize support and involvement from local partners.

Top-down implementation has the potential of creating "capability traps" for lower-level governments because local governments may not have the capacity to enact mandates (Mdee & Harrison, 2019). While top-down accountability is important, it can also subtly undermine local adaptation, which depends on the ability of implementing organizations to develop strong local ties (Campbell, 2018). Local stakeholders can contribute to implementation by helping to creatively adapt institutional designs to local conditions (Baiocchi, Heller, & Silva, 2011). For example, the management of lakes in Bangalore, India in collaboration with a coalition of community groups helped to break out of a "rigidity trap" by drawing attention to new opportunities and by mobilizing new actors and resources (Enqvist, Tengö, & Boonstra, 2016).

Problem-driven iterative adaptation (PDIA) is one framework that has been developed to describe how development work can be made more effective by adopting an adaptive approach (Andrews et al., 2013; Naidoo, Githiari, & Maposa, 2017). PDIA starts by adopting a problem-oriented (rather than solution-oriented) perspective, one that diagnoses concrete problems in their local context. Problem diagnosis typically entails identifying the multiple causes of specific problems and where possible identifying root causes. PDIA avoids settling on simple or optimal solutions that are often poorly aligned with actual local circumstances. Rather, it suggests the value of using experimentation to identify customized strategies that are politically and technologically feasible in order to develop context-appropriate solutions. Implementing such a strategy calls for the ability to learn from interventions and change course as necessary. It also highlights the value of iteratively improving strategies based on ongoing feedback. In other words, PDIA implies the use of prototyping as an adaptive strategy (see Chapter 8). Finally, the PDIA strategy emphasizes the importance of engaging a broad group of stakeholders in this process in order to enhance customization, harness feedback, and build wider ownership of solution strategies. The PDIA model is summarized in Fig. 10.1.

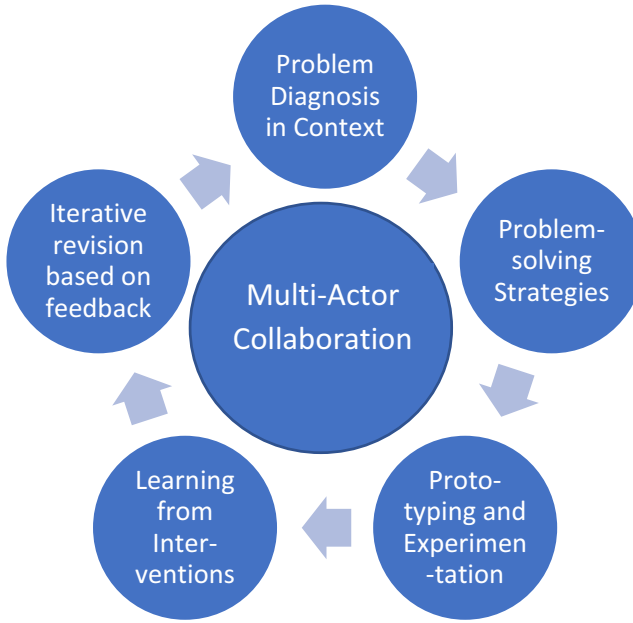

Fig. 10.1. The Problem-driven Iterative Adaptation Model. *Source*: Adapted from Andrews et al. (2013).

PDIA and related perspectives suggest the need to draw two typically contrasting features of problem-solving together with the aid of a third. On the one hand, addressing the systemic nature of problems requires a systemic approach that integrates the different components into a broad-based strategy that works simultaneously on multiple fronts. On the other hand, finding politically and technically feasible solutions to contextually specific problems tends to require more incremental (and hence less systemic) approaches that can address specific aspects and local particularities. Adaptiveness helps to bring the systemic and the incremental together through continuous alignment and adjustment.

One bit of guidance that has developed for multistakeholder partnerships is "get the front end right, do not try and predict too much and adjust as you go along" (Fowler & Biekart, 2017, p. 89). This perspective highlights the importance of building the "adaptive capacity" of groups. This adaptive capacity allows groups to unify incremental responses into systemic responses in a customized fashion, which often means mobilizing a range of resources or complementary sets of policies in response to shifting demands (Nair & Howlett, 2015; Orchard et al., 2019). Adaptive capacity is also commonly understood to be necessary for addressing multidimensional "wicked problems" (Van Epp & Garside, 2016). Complex, multidimensional problems and conflictual problems often produce

political blockages. By acknowledging interdependence, focusing on innovation, and striving for small wins, groups can work through these blockages (Van Bueren, Klijn, & Koppenjan, 2003; Termeer & Dewulf, 2019).

As these points suggest, SDG implementation is unlikely to be a one-shot process. Rather, it requires continuous adaptation to changing circumstances. Progress (or set-back) in achieving the SDGs will affect the strategies and priorities for subsequent efforts. There will be new lessons learned about effective and not-so-effective strategies; new stakeholders will appear and old stakeholders will become less relevant; and new ideas and technological innovations will present new possibilities for addressing old problems. Collaborative adaptation is a way of incorporating these changes into an ongoing framework of goal-setting, implementation, and monitoring and evaluation through continuous adjustment across level, sectors, and stakeholder perspectives.

Implementation is often blocked by external resistance from user groups, interest organizations, tribal leaders, government officials, NGOs, etc. To mitigate such implementation resistance, the actors involved in the cocreation process must act as ambassadors for new solutions by explaining their virtues and potentially positive impacts and by creating supportive alliances with external actors, including elected politicians and financial sponsors. Last, but not least, the implementation of solutions in which manifold resources are mobilized calls for coordination to avoid gaps and overlaps and create synergy and complementarities. Traditional forms of hierarchical and market-driven coordination must give way to pluricentric coordination based on alignment and high-intensity communication (Pedersen, Sehested, & Sørensen, 2011).

Collaborative adaptation can help to build legitimacy that authorizes action and reduces downstream implementation conflict (Fritsch & Newig, 2012). Collaboration can also help projects quickly appreciate and address their limiting conditions related to information, knowledge, or capacity. Because communities evolve as projects transition from early planning and innovation efforts through implementation and follow-up and because this evolution can produce negative or co-destructive outcomes, collaboration can assist communities to continuously align their efforts (Shaw, 2015; Jalonen, Puustinen, & Raisio, 2020). In short, collaboration can facilitate the adaptive capacity of communities.

Finally, adaptive governance requires review of feedback from interventions (Xue, Weng, & Yu, 2018). Monitoring has been found to be very important for successful implementation because it can allow continuous changes in program design if problems can be caught early in the delivery process (Beisheim, Ellersiek, Goltermann, & Kiamba, 2018).

In sum, the point of this section has been that effective approaches to the implementation of SDG solutions in turbulent environments must be adaptive in character, which in turn requires collaboration among key stakeholders.

Collaborative Adaptation as an Integrative Strategy

As many commentators have recognized, the SDGs potentially create "cross-sectoral" tradeoffs and synergies. On the one hand, there are significant tensions between the priorities embodied by the SDGs, particularly with respect to economic growth, environmental protection, and social and economic equality (van Zanten & van Tulder, 2020a, 2020b). These tensions are often accentuated by institutional fragmentation that encourages piecemeal approaches to sustainability issues, increasing the likelihood that pursuit of one goal may have negative impacts on related sustainability efforts. On the other hand, some goals – especially, SDG 1: No Poverty – are synergistic with many of the other SDGs, in the sense that successfully addressing this goal is likely to have positive benefits for the ability to achieve other goals (Kroll, Warchold, & Pradhan, 2019).

Ideally, the sustainability goals can be approached in an *integrative* fashion that mitigates tradeoffs and enhances synergies. There are many possible opportunities – indeed, imperatives – for simultaneously achieving gains in economic well-being and environmental protection. For example, sustainable fisheries or forests are essential for livelihoods and food security, which are in turn necessary for education and health (Duah, Ahenkan, & Larbi, 2020; Timko et al., 2018). Achieving integration, however, requires a more systems-oriented approach that appreciates the interactions among SDGs. Nexus-oriented approaches, for instance, stress the importance of working at the nexus of different domains where issues often intersect, such as "food-energy-water" (Weitz, Nilsson, & Davis, 2014).

While it is possible to identify these synergies and tradeoffs in an abstract fashion, it is difficult to provide a general plan for achieving effective integration among the SDGs. As explored in Chapter 4, the cocreation process can facilitate an integrative approach to the SDGs. While it may not always discover optimum solutions, the cocreation process mobilizes different perspectives on a problem and naturally supports consideration of multiple objectives. As a result, participants are often pushed to identify emergent solutions that will satisfy multiple needs and interests. Thus, cocreation is a process where synergies are identified and tradeoffs can be negotiated in a mutually adaptive manner (Horan, 2019).

One strategy for promoting policy integration of the SDGs is to promote ideas that stimulate holistic policymaking based on collaboration. Sometimes, this takes the form of imagining how a single core goal can serve as a meta-goal around which the pursuit of many other goals can be organized. For example, in Bogota, Columbia, education was used as a framework for the bottom-up integration of the SDGs (Andreoni & Ruiz Vargas, 2020). Another particularly prominent meta-goal is "health in all policies," which conceives of health as a common denominator that unifies many different policy domains. Urban health, for instance, is related to 38 SDG targets and, thus, a systemic "health in all policies' approach has the potential to advance progress toward many targets at once (Ramirez-Rubio et al., 2019). Implementation of a health in all policies strategy can build on a cocreation approach to establish a local "social contract"

around municipal plans (Von Heimburg & Hakkebo, 2017; von Heimburg & Cluley, 2020).

Cocreation can facilitate bottom-up integration of the SDGs by bringing together people who are focused on different SDGs. An exemplar of this process is the Lewa wildlife project in northern Kenya, whose original aim was to protect wildlife habitat. However, to do so, the project has had to work closely with local farmers to develop more sustainable farming techniques, promote community health care, encourage improved local water management, sponsor a women's microcredit program and an adult literacy program, along with several other initiatives (Jiménez-Aceituno, Peterson, Norström, Wong, & Downing, 2019).

In general, "landscape" or "place-based" approaches are particularly well-suited for combining cocreation with synergistic thinking about the SDGs (Axelsson, Angelstam, Elbakidze, Stryamets, & Johansson, 2011; Ayala-Orozco et al., 2018; Demblans, Martínez, & Lavalle, 2020; George & Reed, 2017; Hambleton, 2019; Tan et al., 2019). While such approaches often create their own dilemmas and are certainly not conflict-free, these challenges can be adaptively managed in ways that help to address potentially discordant goals (Feuer, Van Assche, Hernik, Czesak, & Różycka-Czas, 2020). Indeed, one of the valuable features of place-based cocreation for pursuing the SDGs is that it helps communities to recognize and take ownership over the types of mutual adaptations that might be necessary for advancing sustainability (Szetey et al., 2021). Innovation often surfaces tensions and problems that need to be addressed if significant change is going to be produced (Horan, 2019). Pursuing goals together can help to address both the tradeoffs and synergies that arise in pursuing sustainability (Weymouth & Hartz-Karp, 2018).

Possibilities for tradeoffs and synergies arise not only across the SDGs but also between global and local efforts to achieve sustainability. It is easy for local SDG projects to become misaligned with global SDG goals and vice versa. The global framework of SDG targets and indicators for achieving the SDGs are cast at a very general level and can be out of sync with what is happening at the local level. For example, high-level statistics about access to water often fail to capture the realities of local water access. At the same time, local efforts can drift away from global goals and end up pursuing limited, incremental, or local goals. Thus, continuous alignment between global goals and local projects is essential for avoiding tradeoffs and realizing synergies.

The importance of collaborative adaptation across levels of government has increasingly been recognized in the sustainability literature (Armitage, 2008). As with all forms of collaboration, it can be challenging, particularly as different levels of government have varying degrees of power that may frustrate true collaboration (Westskog, Amundsen, Christiansen, & Tønnesen, 2020). Both formal and informal linkages across governing levels are important for facilitating adaptive governance (Dressel, Johansson, Ericsson, & Sandström, 2020; Wyborn, 2015), and mutual learning across governing levels is often critical for success (Pahl-Wostl, 2009).

Collaborative Adaptation Through Social Learning

Ongoing learning about sustainability and collaboration are often at the heart of effective adaptive governance (Van Bueren & ten Heuvelhof, 2005). Learning that occurs within communities via processes of social interaction is typically dubbed "social learning" (Reed et al., 2010). Such communities can include both local and extra-local actors, and social learning is often conceived of as a process of trying to bring together local lay knowledge with expert knowledge (Djalante, Holley, & Thomalla, 2011; Rist, Chidambaranathan, Escobar, Wiesmann, & Zimmermann, 2007). Social learning has also been seen as crucial for bringing adaptive management together with the co-management of natural resources, "because adaptive management without collaboration lacks legitimacy, and co-management without learning-by-doing does not develop the ability to address emerging problems" (Berkes, 2009, p. 1698). An extensive literature has examined the connection between social learning and adaptive capacity, particularly for climate change adaptation (Biesbroek & Wals, 2017).

Significant innovation often calls for learning that results in the transformation of basic assumptions and participant orientations (Quist & Tukker, 2013). Social learning can shift assumptions in ways that increase the recognition of the needs of marginalized actors, a process which has been found to contribute to poverty alleviation (McDougall, Jiggins, Pandit, Thapa Magar Rana, & Leeuwis, 2013). However, assumptions are only likely to be transformed when participation is meaningful to participants (Marschke & Sinclair, 2009).

Transformation of attitudes or perspectives takes time, unfolds over ongoing interactions, and may face setbacks. For example, some research finds that as firms open themselves to engagement with stakeholders, their learning increases rapidly. But over time, learning tends to slow down and become more limited (Dentoni, Bitzer, & Pascucci, 2016). One interpretation for this dynamic is that firms become less open to learning from other stakeholders as they become more committed to particular sustainability strategies.

Cocreation can be used to draw participants into social learning. A study of local climate change adaptation among Vietnamese farmers, for example, found that a co-designed and cocreated social learning process strengthened local relations, increased knowledge of how others perceived climate change issues, deepened understanding of the systemic nature of the issue and knowledge of strategies of climate change adaptation, and improved trust in government – all of which can contribute to building adaptive capacity for dealing with climate change (Phuong et al., 2018).

Effective facilitation of cocreation is an important mechanism for achieving social learning, particularly where trust, human capital, and infrastructure are in short supply or where power differentials are strong (Cudnill, 2010; Van Epp & Garside, 2016). These factors can promote social learning by helping participants examine their basic assumptions, especially those related to social hierarchies and power relations (McDougall et al., 2013). Effective facilitation can enhance participant motivation, mitigate inequalities in participation, and encourage trust and nonhierarchical modes of communication (Rist et al., 2007).

Research suggests that facilitating deeper social learning processes depends on purpose-built governance frameworks that identify barriers to learning, evoke trust on the part of participants, and invest resources that enhance the capacity of participants to engage productively. Learning champions are important for enlisting and empowering the community, and civil society organizations can often help communities to engage in effective social learning (Fischer, 2017; Johannessen et al., 2019). For example, an Australian pilot project on "urine diversion systems" found that social learning was enhanced by facilitating community-oriented leadership, developing strategic planning exercises, and engaging participants in activities that introduced novelty, diversity, and external perspectives (Fam, 2017).

Social networks that share knowledge are also a source of social learning, particularly when they bridge across existing social divides (BenYishay & Mobarak, 2019; Phuong & Lampert, 2019). A study of Swiss social conservation found that farmer-to-farmer social learning about soil conservation was facilitated by transcending conventional political cleavages, by building a sense of mutual respect among farmers and experts, by nurturing communication that took participants outside their existing discussion topics, and by networks that shared local and tacit knowledge (Schneider, Fry, Ledermann, & Rist, 2009). Empowering boundary spanners who can bridge across partisan, farmer-expert, and interlocal differences is one valuable mechanism for promoting social learning.

Cocreation workshops, such as those associated with living labs, can be an effective way to stimulate learning – in part, by encouraging network formation. Although we should not expect a single short workshop to dramatically change people's fundamental perspectives, effective staging of workshops can assist with learning (Garmendia & Stagl, 2010). Role-playing games have been shown to increase both technical and socioinstitutional learning, and scenario workshops are another way to facilitate social learning in order to increase adaptation (Johnson et al., 2012; Salvini, Van Paassen, Ligtenberg, Carrero, & Bregt, 2016).

Joint activities can enhance learning. For example, a study of Cambodian fishing villages found that ecological knowledge was strengthened through Mangrove replanting, patrolling, and setting up fish sanctuaries. In general, the study found that learning how to do a specific task, like monitoring fishing, stimulated broader learning about how to address local problems, for example, by using monitoring in other areas (Marschke & Sinclair, 2009).

Not only is social learning a mechanism of adaptive governance, but social learning itself requires an adaptive approach, since it is an iterative process that unfolds over time (Johannessen et al., 2019). Social learning is most effective when it develops through multiple, iterative "reflect-act-reflect" cycles in a structured way (Van Epp & Garside, 2016). As social learning develops, it can expand the sense of the possibilities for subsequent collective action, and social learning gained in one situation can be used as a platform upon which to engage in more ambitious sustainability efforts (Berkes, 2009; Rist et al., 2007). Table 10.1 summarizes strategies from promoting social learning in ways that facilitate adaptive implementation.

Conclusion

Top-down implementation of "blueprint" strategies for sustainability often lead to stakeholder resistance, fail to align global and local goals, and produce unexpected externalities. This chapter suggests that adaptive strategies offer one viable alternative to these inflexible approaches. Adaptive strategies adjust action to particular contexts, addressing challenges that arise as efforts at sustainability are implemented. Sustainability initiatives encounter many different challenges that must be accommodated if the initiatives are to be successful. The world rarely sits still while nations and communities implement such initiatives, and the initiatives themselves often create resistance and conflict and produce unexpected feedbacks that can erode progress.

Often, sustainability initiatives must tackle social traps that reinforce suboptimal situations or many-dimensional wicked problems that frustrate easy or straightforward solutions. Such traps and wicked problems typically have a systemic character in that they are produced and reinforced by many interacting factors, including negative and positive feedback effects. In essence, addressing such challenges requires mobilizing the "system" and addressing its dynamic nature. Pairing adaptive and collaborative strategies enables a more flexible and responsive approach for dealing with these dynamic system effects.

A starting point for such efforts is to appreciate the kinds of change that sustainability efforts must grapple with. An extensive body of research on adaptive management focuses on how natural ecosystems change as the result of managerial interventions. As new information about the effects of an intervention become available, managers are adaptive if they use this knowledge to revise their intervention strategies. This type of managerial adaptation does not necessarily require collaboration. However, if we widen our view of the dynamic nature of the system to include community stakeholders and their responses to proposed managerial interventions, the value of embracing a strategy of *collaborative adaptation* become apparent. Fig. 10.1 provided a diagnostic for analyzing the responses to different challenges and the potential need for collaboration.

One of the major challenges of achieving the SDGs is fostering the type of integration across goals that overcomes negative interactions and takes advantages of possible synergies. Once again, however, doing so requires fostering system-level collaboration. Cocreation strategies can assist with this task by bringing together citizens and stakeholders with different perspectives, agendas, and resources and encouraging them to explore the possibilities for achieving synergies. Cocreation can help to reveal opportunities for synergistic action that are not widely appreciated or even imagined prior to collaboration. Often such possibilities become imaginable when different communities and disciplines are brought together to explore possibilities of cooperation. *Place-based* cocreation is often a particularly powerful strategy for encouraging integrative sustainability strategies.

Social learning is often the key social and political mechanism at the heart of collaborative adaptation in the implementation phase. How citizens and stakeholders learn from one another about the possibilities of working together in new

Table 10.2. Strategies for Promoting Social Learning.

Social Learning Strategies	Description
Promote meaningful participation	To encourage critical reflection and make participation meaningful to stakeholders
Encourage openness to learning	Encourage stakeholders to adopt and maintain open attitudes toward learning from others
Ensure effective facilitation	Exercise facilitative leadership in order to encourage critical reflection and reduce social barriers to learning
Build learning capacity	Invest time and resources in empowering participants to learn
Build and mobilize social networks	Support and activate social networks that can share knowledge, particularly across social divides
Convene cocreation workshops	Cocreation workshops can be used to engage stakeholders in processes and activities that encourage social learning
Promote iterative "reflect-act-reflect" cycles	Allow multiple opportunities for communities to engage in reflection as collaboration proceeds

ways to imagine and achieve ambitious ends is essential to the transformative agenda of the SDGs. Social learning is the grease that enables different social groups and institutions to engage in the adaptive give-and-take required by more integrative approaches to sustainability. Although social learning is rarely the mechanical output of organizing a cocreation workshop, cocreation can be understood as a framework for promoting social learning. Efforts to facilitate and promote social learning through cocreation can build on some of the lessons learned from past research, as summarized in Table 10.2.