

## Neither 'Top-down' nor 'Bottom-up': A 'Middle-out' Alternative to Sustainable Development

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We know that a data revolution is unfolding, allowing us to see more clearly than ever where we are and where we need to go, and to ensure that everyone is counted in. We know that creative initiatives across the world are pioneering new models of sustainable production and consumption that can be replicated. We know that governance at both the national and international levels can be reformed to more efficiently serve twenty-first century realities. And we know that today our world is host to the first truly globalized, interconnected and highly mobilized civil society, ready and able to serve as a participant, joint steward and powerful engine of change and transformation. (United Nations General Assembly 2014: 7)

This statement by the UN General Assembly reflects an understanding of the scale of the sustainable development challenge we face and contends that given this scale, volumes of data as well as the best possible technologies for big data management and analysis must be brought to bear. We conclude this volume by suggesting that the scale of the challenge, and perhaps more importantly the depth of the solutions required, calls not just for the quantitative big data implied in the UN General Assembly's statement but also for 'qualitative big data'. By 'qualitative big data', we emphasize the local and grassroots-level knowledge of the stakeholders—knowledge without a priori structure that tends to be documented in ways through case studies that produce 'unstructured' data. Case studies, like the research presented here in this volume, allow us to capture the important depth and richness of cultural contexts that must be understood for sustainable development 'solutions' to work at the local level. If harnessed at a large enough scale, this depth and richness derived from specific case studies can meaningfully inform policy, economic, technological, social, and other innovations across the infinitely diverse communities and cultures endeavoring to achieve sustainable development.

Beginning with Chapter 1, we have emphasized the need to bridge bottom-up and top-down approaches to sustainable development. Section 1 consisted of case studies calling to question strictly top-down approaches. On the one hand, from Chatterjee's illustration of the shortcomings of the Forest Rights Act to Pushkaran's account of the limitations of science to enumerate India's tigers or Yadav and Sahu's description of the failure of conservation measures in the Chambal Wildlife Sanctuary to meet the expectations of local people, these chapters point out how top-down approaches can be undermined by unanticipated or misunderstood dimensions of local contexts. On the other hand, as Chandrashekar and Seshaiiah demonstrate in Chapter 4, top-down approaches do have the potential to improve weak or ineffectual institutions, for example, land governance, especially when they introduce innovative hybrid forms of governance such as those described in the context of 'comanagement' in Bangladesh's wetlands by Chowdhury in Chapter 6.

The chapters in Section 2 explore experiments with bottom-up approaches to sustainable development. Whether flood management in Assam, community-based water resource management in the Indian Sundarbans, or community-based ecotourism in Goa, these chapters point to the potential for bottom-up approaches to produce relevant solutions in which affected communities are invested. But they also point to the limitations of bottom-up approaches. Lack of access to financing, a problem of rural local bodies discussed by Rajanayagam in Chapter 9, is one example. Likewise, the deployment of solar home lighting systems in rural Indian villages, as demonstrated by Singh in Chapter 10, can suffer when local communities lack access to technology, infrastructure, or knowledge required to maintain solar home lighting systems.

Finally, in Section 3 we complicate matters by introducing the imperative of climate change adaptation in a series of chapters that explore the opportunities and challenges of achieving sustainable development goals while adapting to climate change. These chapters tell us that local knowledge and perceptions of climate change matter in how people choose to adapt and that adaptive capacities can be enhanced through education. They also highlight the need for bridging top-down and bottom-up approaches. Collectively, these chapters reveal that local and grassroots sustainable development strategies are widespread throughout India and Bangladesh and increasingly well documented by case study methodology. They also show us that innovative efforts to integrate local knowledge with institutions linked to the sustainable development apparatus are also occurring. These lessons point to the importance of developing strategies for aggregating and

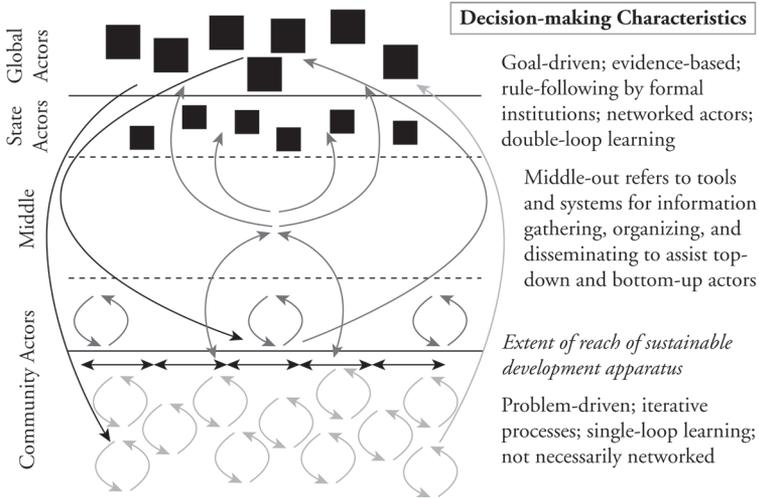
disseminating models of innovation and adaptation practiced at the local level so that high-level institutions can expand their knowledge of sustainable development strategy and diffuse this knowledge across the sustainable development apparatus.

To date, academics and policy-makers have insufficiently utilized the extensive knowledge being produced in case studies of sustainable development and climate change adaptation. This is partially due to the nature of case studies that are seen as having limited usefulness because idiosyncratic differences across cases make generalizations problematic. This is precisely the tension identified in Chapter 1 between the homogeneous and universal goal of 'sustainable development' and the unique and site-specific sustainable development goals of communities. In this concluding chapter, we aim to make a case for the power of case studies through accumulating knowledge that is only available when a large number of case studies are aggregated and then analyzed. We call for scaling up the aggregation of case study research to a regional and then global level so that knowledge accumulation and dissemination can happen more rapidly and efficiently than these currently do, all the while respecting local knowledge and epistemology.

## Adapting Case Studies for a 'Middle-out' Bridge Between Top-down and Bottom-up

Given the scale and speed of global climate change and its attendant socio-ecological disruptions, there is an urgent need to begin identifying successful sustainable development strategies across multiple social, geographical, and temporal scales. This volume makes the case that neither top-down approach nor bottom-up approach alone has the ability to produce the needed insight. And yet, given the demands of climate adaptation, community-based sustainability experiments—often little more than tinkering or muddling in livelihood and survival strategies—are occurring on a daily basis around the world. The case study approach represents one possible method for beginning to tap into the knowledge being produced through these experiments. Furthermore, the information technology now exists to facilitate compilation of qualitative reports of community-based sustainability experiments into a vast corpus with the potential to be mined by both communities and individual actors and high-level institutions and decision-makers within the sustainable development apparatus.

**Figure 16.1:**  
 'Middle-out' coordination of sustainable development efforts



Source: Authors.

Figure 16.1 depicts the relationship between the state and global actors currently controlling the sustainable development apparatus and the community actors engaged in iterative, and typically closed, processes of experimentation to achieve local sustainable development goals. The 'middle-out' approach does not call for new institutions bridging these extremes. Middle-out refers instead to a system of information flow wherein lessons learned in the previously isolated and closed-loop community-based experiments are aggregated and organized. With access to this information, top-down decision-makers can more effectively support strategies relevant to local contexts and community-based actors, who previously relied on ad hoc networks to learning anecdotally from one another, can more systematically learn directly from one another.

In short, the middle-out approach relies on aggregation of case studies and other reports of community-based sustainability experiments to develop a knowledge base for community-based sustainability experimentation processes that can be leveraged by a wide range of decision-makers and actors at multiple levels. The 'middle-out' platform will create a space for both top- and bottom-level stakeholders to combine the power of the descriptive richness of qualitative case studies with the analytical power of natural language processing and other information science tools. This strategy holds

the potential to bring to bear substantial yet untapped knowledge in sustainable development strategies. The virtual 'middle-out' space is possible because of present rapid diffusion and access to information and communication technologies (ICTs) in developing countries such as India and Bangladesh. Brabham (2009: 243) has identified that "the medium of the Web enables us to harness collective intellect among a population in ways face-to-face planning meetings cannot." The task of creating a structured and user-friendly 'middle-out' platform is no doubt challenging as it involves vast amounts of unstructured data. However, we believe that if successful, this platform can open up a plethora of rich local-level knowledge, which can be utilized from local- to national- and global-level stakeholders.

The middle-out approach begins with the assumption, explained above, that small experiments in climate adaptation and sustainable development are producing extensive yet underutilized knowledge vital to the social learning required for societies to transition to a sustainable future. It draws on the 'small experiment framework', an approach to behavior change developed by psychologists (Irvine and Kaplan 2001; Kaplan 1996), that is premised on the notion that the human tendency to 'muddle through' problem situations can be modified into a form of 'adaptive muddling' that can result in more rapid social learning and change (De Young and Kaplan 2012). In 'muddling through', humans constantly take small steps but without straying far from the results of past changes. The problem is that "[m]uddling is a process characterized by ... a tendency to compromise, and an avoidance of significant bold or visionary steps" (De Young and Kaplan 2012: 290). Key to adaptive muddling is that it emphasizes not small steps but small experiments.

According to De Young (1999: 602),

It offers a way of simultaneously exploring several possible solutions, thus avoiding the sluggishness that plagues one-solution-at-a-time approaches. People are empowered to apply local or personal knowledge to a situation. Different people applying different knowledge to the same situation creates a variety of potential solutions.

Small experiments are a framework to support problem-solving, as De Young (2014: 9) explains, "that is based on people's innate inclinations to explore and understand (Kaplan and Kaplan 2003, 2009) and on their brain having evolved to prospect the future not just track the past (Seligman et al. 2013)." As important, small experiments support behavioral innovation and have the potential for rapid dissemination of findings. Finally, the ubiquity of small experiments makes them an ideal unit of analysis. "Small experiments

are going on all the time,” contends De Young (2014). “Consider the many pilot programs, demonstration sites, field tests, and trial runs regularly reported in both popular and scientific publications, as well as [in] neighborhood, community, and village examples.” Many of the chapters in this volume exemplify small experiments—whether in rural electrification or local governance of ecotourism, wildlife, or water.

## Novelty of Middle-out Approach

What is unique about the middle-out approach is its focus on what is essentially an information management system capable of capturing knowledge emerging out of bottom-up small experiments and integrate it with top-down knowledge, strategies, and resources. In this manner, the middle-out approach aims to overcome the gap between the historically dominant top-down approach to sustainable development and the more recent emphasis on bottom-up approaches in which solutions emerge and are implemented by communities.

Our middle-out approach proposes utilizing a whole new set of tools only recently available to network formal and informal knowledge, thus moving beyond a process orientation (e.g., inserting NGOs as mediators between top-down and bottom-up actors) toward an actual platform to facilitate knowledge integration that informs more effective decision-making. We opened this chapter by pointing out that the UN General Assembly is quite aware of both the scale of the challenge ahead of us and the emerging technological potential to scale data and knowledge to meet the challenge. Many of the same ICT advances that have ushered in the era of highly quantitative ‘big data’ to which the UN General Assembly refers can be deployed to harness the power of ‘qualitative big data’ central to a middle-out approach. The sources of these data, we propose, are the individuals working independently within their communities to develop innovative approaches in the struggle to meet everyday needs. Even at the lowest socioeconomic strata, increased access to mobile and Internet technologies makes these individuals potential data producers. Their knowledge and experiences can be documented, aggregated, and networked so that grassroots knowledge at the bottom of the pyramid can become more accessible to policy-makers, development professionals, and others working from the top-down.

This newly networked knowledge, which exists in a conceptual ‘middle’, is valuable not only to the extent that it is pushed upward into the top-down decision-making process but also to the extent that it can be accessed

by grassroots actors to drive learning and innovation. In our proposed middle-out approach, individuals and communities would be able, using the same mobile and Internet technologies used to upload local sustainable development knowledge, to access the networked knowledge resulting from the synthesis of wide-ranging case studies, reports, and informal documentation of community-level sustainable development efforts. The primary advantage of utilizing ICTs to begin networking otherwise isolated knowledge is that the same technologies can be utilized to overcome both vertical communication barriers between bottom-up and top-down actors and horizontal communication barriers preventing geospatially dispersed communities from learning from one another. For example, a community on the Tamil Nadu coast might recover from flood damage through a combination of top-down government intervention and bottom-up initiatives. An academic researcher or NGO involved in the recovery might next produce a case study documenting the successes and failures of the efforts and their associated learning. Normally, such a report winds up isolated in academic journals or might gain modest circulation among development professionals. Our middle-out approach proposes utilizing ICT tools to aggregate this case study with thousands of others, apply machine learning to organize and categorize the knowledge, and package it for presentation through an online platform. Through this, middle-out approach, in the future communities in West Bengal, Bangladesh, or elsewhere, can learn from the specific experiences of the community in Tamil Nadu as well as from the knowledge that emerges by networking these experiences in a database of thousands of other experiences.

In this manner, the middle-out platform has the following advantages:

- Geographically isolated communities can more easily exchange information and knowledge.
- National- or state-level policy-makers can be more strategic in applying top-down strategies by learning from previously inaccessible and disconnected knowledge that emerges from communities.
- The World Bank, Asian Development Bank (ADB), and other financial institutions that direct funding through state and national governments toward poverty eradication and sustainable development can see more transparently the justifications of decisions about why, when, where, and how to fund specific initiatives, especially at the grassroots level where large institutions seldom apply their resources directly.
- The middle-out approach can reduce the costs of obtaining community-level feedback because the middle-out framework itself generates reports

on the experiences of communities engaging in sustainable development initiatives.

- The middle-out approach complements rather than replaces the existing top-down and bottom-up approaches to sustainable development governance. Case studies are valuable in providing micro-level contextual knowledge, but at the same, generalizing across cases is problematic because each case study represents a sample size of one. Our middle-out approach proposes to aggregate large numbers of case studies and then apply qualitative big data analysis techniques that can produce topics, categories, and tags to represent them, that can make generalization across the cases possible.
- The most important feature of middle-out approach is that it accumulates indigenous and traditional knowledge that would otherwise be underutilized or even lost.

While the middle-out approach has great potential, it also faces the following challenges:

- Even though the penetration of ICTs toward the bottom of the pyramid is occurring even faster than earlier (Chib et al. 2015; Chuang and Schechter 2015), the penetration is not even and has not benefited all sections of the society (Dutta and Das 2016).
- Even if the citizens of developing countries are getting more and more access to ICTs, personal skills and abilities may limit one's potential to benefit from the presence of the technology. One example is the problem of illiterate mobile users, for whom technological innovations around audio, graphical, or other non-text interfaces are needed.
- The middle-out approach is based on the premises of structuring text-based qualitative data that is by its nature unstructured. For example, micro case studies provide nuanced facts that are highly heterogeneous in nature. Advanced text analytics procedures can be deployed for such a challenge but have not been tested in this context.

## Middle-out Approach: Beyond Participatory Development

Participation, empowerment, and partnership are the key concepts related to development discourse. Participation 'by the people' is defined not just

as a basic need but also as a fundamental human right, which is a tool for empowerment (Cornwall 2002, 2003). According to the World Bank (1996), participatory development is “a process through which stakeholders influence and share control over development initiatives, and the decisions and resources which affect them.” The overarching objective of participatory development is to involve people and communities actively in identifying problems, formulating plans, and implementing decisions over their lives (DFID 2003). In this process, all the stakeholders have a critical role in the success of the project (Chopra et al. 1990; Mansuri and Rao 2004). A stakeholder is “any individual, community, group or organization with an interest in the outcome of a programme, either as a result of being affected by it positively or negatively or by being able to influence the activity in a positive or negative way” (DFID 2003: 2.1). Yet nowhere in the participatory development literature is discussion of how to aggregate dispersed and isolated knowledge that exists in communities and individuals throughout the world so that participation is not just a process but also a crucial mechanism for accessing and applying networked knowledge. The middle-out approach we describe here fills this gap.

The middle-out approach presumes participatory processes as a starting point and then proposes tools for aggregating the cumulative knowledge of communities to be accessed through participatory processes, thus making them more effective. If scaled up appropriately, the middle-out platform can create a significant amount of data, which can be utilized across communities. As such, the middle-out approach enhances participatory development. We introduce the middle-out approach in this concluding chapter with the hope of provoking readers into considering the possibilities, within this new conceptual model, for ICTs to provide tools that address the gaps between top-down and bottom-up approaches captured in the preceding chapters. As a conceptual model, we do not have details of actual implementation to share with readers. A small pilot project aggregating case study and other bottom-up knowledge in single country would be a logical next step for testing proof of concept.

In a modest way, this volume points to the potential value of building a middle-out approach by aggregating case studies across bottom-up and top-down approaches to sustainable development. Scaled up 100 or even 1,000 times from the 14 case studies compiled here, new insights will emerge and new strategies for locally relevant and contextualized sustainable development strategies will follow. Local innovators and leaders could have access to extensive and systematic case study-derived knowledge to adapt and apply to local experiments, while top-down institutions can more sensitively and

strategically place resources to facilitate local strategies. The decentralized structure and horizontal rather than vertical linkages will provide peer-to-peer communication and diffusion of knowledge with the potential to overcome imbalances of power, economic inequality, cultural barriers, and other social factors that prevent the dissemination, flow, and implementation of sustainability solutions. Governance for sustainable development in the anthropocene will require nothing less.

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