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Perspective

Scaling up Solutions for a Sustainability Transition

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The main challenge for a sustainability transition is to scale up successful solutions. Upscaling requires coalitions of public, private, and civil society actors who align their motivations. Pathways to upscaling may involve leveraging a dominant player's market power, integrating successful initiatives into public policy, or reinforcing government-led change with private efforts. Various actors agree to collaborate to take advantage of their complementary capabilities, e.g., government policies facilitate private action, market incentives reward progressive actors while government sanctions punish laggards, actors take up different tasks of the policy cycle, and large players absorb and disseminate pioneer efforts. To achieve durable impacts, the upscaling of solutions to reach sustainability must continually maintain a balance of incentives among key actors. We identify general lessons for successful upscaling that provide insights on the importance of motivating actors, designing collaborations for lasting success, and incorporating concerns of developing countries.

Introduction

Humanity is on a dangerous trajectory. Climate change and environmentally destructive practices have increased the risk of extreme weather events, food system failures, biodiversity loss, and geopolitical instability. Humanity must change its practices, quickly and strategically. A sustainability transition leveraging the efforts of private companies, governments, and civil society actors—i.e., non-governmental organizations (NGOs), community organizations, philanthropic foundations, academia, trade unions, etc.—is required.

Many solutions for a sustainability transition are already known, adopted, and tested by some pioneer actors, or are in advanced stages of development. We know that improved fertilizer management can reduce agricultural emissions and improve water quality; that keeping fish catch within sustainable levels can prevent fishery collapse; that paying for vital ecosystem services can reduce infrastructure costs while preserving natural ecosystems; and so on. But only a small fraction of market players have voluntarily adopted sustainability solutions, and resistant actors often stall progress. For example, payments for ecosystem services represent less than 0.1% of the value of international trade globally.[1] Market shares of eco-certified and fair-trade products rarely exceed 20%.[2] Among the 80,000 multinational companies operating in the world, only 250–300 have played an active role investing in sustainable development over the past two decades.[3] Only 12% of firms in agricultural supply chains have adopted a zero or zero net deforestation commitment for all their sourced commodities.[4] In 2019, socially and environmentally responsible funds represented only 0.8% of the portfolio of BlackRock, the largest investment firm in the world. Despite broad enthusiasm for market-based regulatory instruments, carbon prices cover only 20% of global emissions and mostly fall under $25/ton, although the global social cost of carbon is estimated to be much higher.[5]

The upscaling of these and other successful solutions is therefore a key challenge for a sustainability transition. Obstacles confront all stakeholders. Short-term, profit-seeking imperatives from market competition and financial markets constrain the private sector's ability to adopt more sustainable practices at scale. Governments can impose regulatory limits only within their jurisdictions, and those restrictions may create domestic social discontent as well as the loss of economic activities to other jurisdictions with less stringent environmental regulations. Environmental NGOs are constrained by the expectations of their supporters and face challenges in influencing governments and companies who are indifferent to sustainability concerns. Powerful vested interests defend the status quo and reinforce the intrinsic inertia of social and technological systems.

We need to better understand the pathways to overcome these obstacles and upscale innovations for sustainability. While specific prescriptions are context dependent, we identify generic approaches to achieve sustainability transitions at scale. We have focused on efforts that take the world mostly as it is—leveraging corporate consolidation, for example, rather than advocating for entirely new market conditions—but the efforts we describe ultimately have shaped and will influence culture and institutions, not just practices. To understand these efforts and pathways, we examine a few illustrative cases of upscaling initiatives, mostly in commodity sectors. We draw from interviews with key experts to distill guidance for potential leaders of transitions. These narratives should help leaders diagnose potential opportunities for upscaling and avoid common pitfalls.

In what follows, we describe the upscaling challenge, illustrate the main upscaling pathways, then draw lessons on the importance of creating synergies among multiple actors and on conditions for upscaling. Our key insights are, first, that upscaling almost always involves collaboration among public, private, and civil society actors. Second, the alignment of incentives

and motivations of all relevant actors is critical to success. These motivations and incentives are neither static nor exogenous, as actors influence each other's incentives. Third, actors' roles and stakeholder interactions are dynamic and evolve as the sustainability issue(s) of a specific sector change, partly in response to their activities. Success is not an end state; it is a continuing process.

Challenge: Upscaling

For change that matters, sustainable practices must scale up within sectors and scale out across geographies and industries. Upscaling increases the impact of environmental change for obvious reasons. The more broadly sustainability measures are applied, the greater their impact. Having McDonald's and Costco both agreeing to purchase only eco-certified fish increases demand for sustainable seafood more than if just one had made the commitment. Moreover, if only the most progressive actors adopt sustainability commitments, two-tier markets arise, with committed buyers supplied by crops grown on land cleared long ago or by well-managed fisheries, and uncommitted buyers continuing to purchase commodities produced in ways that contribute to deforestation and overfishing. Upscaling is also necessary to reduce leakage or displacement of negative impacts. The few countries that managed the difficult shift from deforestation to forest conservation simultaneously imported more products that caused deforestation elsewhere.[6] If more countries or companies commit to reducing deforestation, the potential for such leakage will diminish.

Promoting adoption at scale of existing solutions requires three elements: (1) improving understanding and raising awareness for a critical mass of stakeholders; (2) creating motivation and incentives for new practices by embedding the practices into institutional and policy standards or by modifying taxes and subsidies; and (3) developing capabilities to implement new practices at a socially acceptable cost.[7] Achieving these upscaling conditions is inherently challenging, however, because of the diversity of parties and interests involved. Relevant stakeholders include private market players (e.g., producers, supply chain actors, retailers), governmental actors (policy makers, regulators, and managers at federal and local levels), and civil society (e.g., nonprofit organizations and foundations dedicated to encouraging sustainable practices, as well as others, such as community groups and unions). These parties all have an interest in the practices targeted for change, but they pursue different short-term objectives: seeking profits and rewarding their shareholders for companies; serving public and constituency interests within their jurisdiction for governments; and promoting specific social and environmental values for civil society.

A standard paradigm conceives of these actors in static roles with opposing interests: private profit-maximizing firms create externalities (e.g., farmers apply too much fertilizer); civil society lobbies for regulations (e.g., NGOs push for non-point source water quality regulations); and government negotiates across interest groups to set and enforce the policies that emerge (e.g., governments create limits on water pollutant loads). In recent years, however, many of these actors have begun to recognize a broader and more dynamic set of interests and possibilities. Firms have found that they can reduce systemic risks to their businesses and reap reputational rewards when they act to internalize externalities. Civil society has seen that it can increase its influence and impact through engagement with the private sector. And governments have sometimes recognized that they can achieve more social impact at lower cost when working in collaboration with affected industries and interested NGOs. The recognition by each of these actors that they have a broader set of interests that partially overlap has opened the way for creative collaborations to tackle sustainability challenges. Those collaborations have depended on finding opportunities to align interests and have required recognition that interests and therefore opportunities evolve over time.

There are still significant challenges. Firms must take on operational and financial risks to embark on new sustainability initiatives. Governments have competing priorities, particularly with economic development—forest conservation goals, for example, may impede an agricultural development push. And NGOs, responsible to their supporters, can compromise only so much in collaborations with firms and governments.

Here, we discuss three upscaling pathways: leveraging a dominant private actor's market power; integrating civil society or private sector initiatives into public policy; and reinforcing government-led change with private efforts. These pathways have demonstrated promise, but success has been elusive. We discuss proposed solutions in the section that follows.

Market Power Pathway

Corporate consolidation has created firms with market dominance. Five trading firms control 90% of the global palm oil market; five companies are responsible for almost half of all global farmed Atlantic salmon; Home Depot and Lowe's account for more than a third of the US home improvement and hardware retail market; and so on.[8,9] Such consolidation makes it easier for civil society and governments to collaborate with private actors—there are fewer market participants to coordinate with. More importantly, these private actors often wield significant power over their supply chains, allowing them to impose voluntary standards on a large share of the market.[10] Suppliers must meet these standards for market access.[11] In 2015, more than half of a random sample of 449 companies listed on the largest OECD stock exchanges in the food, wood products, and textile sectors had adopted sustainable sourcing practices.[12] Dominant players primarily impose standards to control quality and address competition, but they can also advance their sustainability goals through standards, often to decrease reputational risk, among other motives.

This pathway is most effective when a private actor with market power is willing to engage with civil society and/or governments.[13] The private actor motivates and educates its supply chain. Civil society and governments help provide information, support, incentives, and legitimacy. Two examples of this pathway illustrate both its potential and challenges: eco-certification in the global whitefish sector and private deforestation commitments.

The movement of the global whitefish sector to Marine Stewardship Council (MSC) certification through Unilever's early leadership has overall been a success. In the 1990s, Unilever was the world's largest seller of frozen seafood and a dominant player in the market for whitefish in particular. After the 1992 collapse of the Northern cod fishery and threats to other fisheries, Unilever managers raised concerns about the depletion of fish stocks

critical to their brands. In addition, Greenpeace and other NGOs campaigned for Unilever and others to act, using a naming-and-shaming approach.[14,15] Unilever thus committed to buy only sustainably sourced fish and asked its suppliers to get on board, even dropping those who could not confirm legal catches. In 1996, Unilever began working with the World Wide Fund for Nature (WWF) to develop the MSC as an eco-certification program for seafood generally.[16] Once the MSC standards were established, whitefish fisheries, including New Zealand hoki and Alaska pollock, were among the first large fisheries to get certified. Smaller, progressive retailers such as Migros, Sainsbury's, and Whole Foods were the first to join Unilever in shifting purchases. As the market built, other much larger buyers demanded MSC-certified fish, too; e.g., Lidl and Walmart in 2006 and McDonald's in 2011. In response, additional whitefish fisheries, such as Russian pollock, stepped up to the MSC standard. By 2018, more than 60% of the global whitefish market was MSC certified. MSC has adopted changes over time to strengthen its standards and to improve the reliability of third-party certifications.[17] The whitefish market was in some ways primed for success given the high market concentration in this sector. Two Arctic fisheries are responsible for almost a quarter of the global whitefish catch,[18] reducing the number of producers to corral. Moreover, many whitefish fisheries were already well managed.

As a second example, private deforestation commitments illustrate the challenges of upscaling through the market power pathway. In 2010, the Consumer Goods Forum, representing 400 companies, set a goal of zero net deforestation by 2020. Working with NGO partners, Consumer Goods Forum companies enlisted traders and producers in a joint effort to ensure that commodities are produced without deforestation. Companies have been slow to translate their aspirational goals into effective, on-the-ground implementation, however.[10] Of the Consumer Goods Forum companies pledging to reduce deforestation, only about a quarter had concrete action plans to reduce deforestation in place by 2016.[10] Implementation challenges stymied both planning and action. Traceability along full supply chains is difficult to create for commodities such as palm oil. Sustainable sourcing also often disadvantages small producers, who lack the resources to comply or to demonstrate compliance with environmental and social standards. Private companies thus fell far short of their goals, and, after these commitments were made, rates of deforestation have increased overall.[19] To transform the entire industry, a larger fraction of companies would have to make zero-deforestation commitments, and all those with commitments would have to develop and implement action plans.

Supportive public policies are required to overcome these challenges.[10] The threat of formal regulation can motivate further action; disclosure requirements can help create transparency; public policy initiatives can reduce demand for products grown on deforested land, therefore reducing the threat of leakage; and information sharing, technical support, and subsidies can help smallholders adopt more sustainable practices.

These two cases illustrate the need for broad collaborations among local producers, transnational companies, governments, and NGOs where sustainability improvements are challenging. Whitefish has proven a more tractable issue for sustainability than deforestation, which requires efforts by many actors across an array of commodity sectors (beef, soy, palm oil, pulp).

Public Policy Integration Pathway

In this pathway, after civil society organizations or progressive actors from the private sector design and pilot voluntary sustainability initiatives, government adopts elements of successful initiatives into legal mandates. Such public policy integration means that these initiatives apply to all actors in a jurisdiction, considerably scaling up their application.[20] This pathway requires private actors to first demonstrate economic and technical feasibility. With such success, progressive business leaders may encourage public policy integration to avoid being subject to costs not borne by competitors and ensure a level playing field. The demonstration of feasibility can also reduce policy opposition. The pathway then requires willing and motivated policy makers to enact a policy and enforce its requirements. Mozambique's collaboration with the Better Cotton Initiative and Bolivia's 1996 revision of its forestry law illustrate the promise and pitfalls of this pathway.

The Better Cotton Initiative (BCI) grew out of a roundtable on cotton convened by WWF in 2005. In 2010, the roundtable produced principles and criteria for more sustainable cotton production. Supported by a collaboration among major global brands, including Ikea, H&M, Levi's, Adidas, and Nike, BCI aimed to enlist 30% of the global market by 2020. By the 2017–2018 cotton season, about 19% of global production was Better Cotton certified. A few years ago, Mozambique sought to revitalize its cotton sector, which accounts for 20% of its exports. The country turned to BCI as a source of standards for better management and as a brand that could improve access to global markets. In 2014, the Government of Mozambique entered a partnership with BCI, embedding the BCI principles and criteria into national regulations and setting a goal of becoming the first country to produce 100% Better Cotton.[21] By 2017, 86% of Mozambique's cotton farmers grew Better Cotton.[22]

As a second example, Bolivia's 1996 revision of its forestry law illustrates the fragility of this pathway. The case initially looked successful. The 1996 law allocated concessions to private firms, authorizing them to undertake long-term management responsibilities. Inspired by the Forest Stewardship Council (FSC) standard, a voluntary certification scheme for forests, Bolivia incorporated FSC forestry management standards into its law.[23] Bolivia's approach thus combined the incentives of market access and price premiums associated with certification with the requirement to comply with the revised law. USAID supported Bolivia's efforts with financial and technical resources. NGOs also provided significant support. In the decade following the 1996 revision, Bolivia certified an additional 2.2 million hectares of forests and increased timber exports.[24] However, since 2008, the forest area under certification in Bolivia has dropped sharply due to a lack of clear land tenure, changes in the global timber market, a construction boom in Bolivia, low or absent price premiums for certified timber products, and a decrease in support from international institutions, NGOs, and the national government after the initial years.

These two cases illustrate that public policy integration can take sustainability solutions to scale, but that it alone is not enough. As they design solutions, governments, civil society, and private actors must ensure that these solutions will be implemented for the long run. This includes resolving structural

obstacles to implementation, such as lack of clear land tenure and low price premiums in the Bolivian case, and creating mechanisms to buffer against contextual factors such as market or policy fluctuations.

Government-Led Pathway

In this pathway, governments lead transformations, reinforced by private action. This pathway requires willing and capable policy makers, and coordination with civil society and private actors. The efforts to reduce deforestation in the Brazilian Amazon and to quickly respond to the destruction of the stratospheric ozone layer exemplify this pathway.

The successful effort to reduce deforestation in the Brazilian Amazon between 2007 and 2013 illustrates this pathway. Over the course of the 1980s and 1990s, NGO campaigns and media coverage made the Amazon rainforest one of the most iconic ecosystems on Earth and built global concern about increasing deforestation in the region.[25] A spike in deforestation and the murder of a nun, Dorothy Stang, in 2005, sparked global outcry. President Lula launched an aggressive effort to control deforestation, with coordinated action on multiple fronts.[26] His government set aside large swaths of land in protected areas and indigenous reserves. It deployed federal law enforcement troops, guided by satellite monitoring, to apprehend and prosecute people clearing land illegally. It imposed severe financial sanctions on counties that failed to control deforestation, denying access to credit to all farmers in those counties. It also created a new land registry to formalize land tenure.

In support of this government effort, NGO activists launched naming-and-shaming campaigns that led to the Soy Moratorium, a commitment by the major soy traders not to buy soy from properties in the Brazilian Amazon with forest clearing after the date of signature (July 2006). The global trade in soy is highly concentrated, with eight companies controlling more than half of the processing and export of soybeans.[8] By 2014, only 1% of soy expansion in the Amazon came from forest clearing.[27] A similar effort in the beef sector—zero-deforestation cattle agreements—was less successful because of leakage between properties.[28] Nonetheless, by 2012, the three initiatives—the government push, the beef effort, and the Soy Moratorium—had reduced the rate of deforestation by more than 80% from its peak in 2003, while soy and beef production in Brazil continued to grow. This success has proven vulnerable to political change, however. In 2018, Brazil elected Jair Bolsonaro president. Bolsonaro strongly opposed conservation policies and weakened enforcement against illegal logging. Between August 2018 and July 2019, the deforestation rate in the Amazon had increased by 30% compared with the previous 12 months.[29]

As a second example in a different sector, the Montreal Protocol illustrates a key interaction between governments and the private sector. Chlorofluorocarbons (CFCs) are industrial chemicals that were widely used as refrigerants and propellants in spray cans and played prominent roles in several manufacturing industries. In 1974, scientists began sounding the alarm that CFCs and related chemicals could destroy the ozone layer. The United States and Scandinavia banned CFCs in aerosols in the late 1970s.[30,31] International negotiations, however, stalled in the face of European opposition. The first international agreement concerning CFCs, the 1985 Vienna Convention for the Protection of the Ozone Layer, had only 20 signatories, and, rather than establish concrete regulations, set up an information exchange and research apparatus.

That same year, British scientists discovered a seasonal ozone "hole" over Antarctica–a large area where stratospheric ozone nearly disappeared during the cold winter. If the depletion of ozone were to spread to less desolate areas of the Earth, there would be serious threats to health (skin cancer) and ecosystem function. Consumers in rich countries had already decreased purchases of aerosol spray cans that used CFCs as propellants. More than 60 countries participated in developing the Montreal Protocol on Substances that Deplete the Ozone Layer in 1987. With clear timelines for reducing production, the protocol helped to motivate industry investments to develop alternatives to CFCs and other ozone-depleting chemicals. The highly concentrated nature of the industry made it easier to coordinate action. DuPont, an industry leader, developed such alternatives and stopped CFC production ahead of schedule. The ozone hole is recovering slowly.[32]

The Montreal Protocol is a successful government-led initiative thanks to close collaboration among governmental actors, industry, and civil society.[31,33] The US Environmental Protection Agency provided leadership in the creation of the Protocol. The United Nations Environment Program organized a Technical and Economic Assessment Panel (TEAP) that served as a neutral arena in which engineering experts from industry worked with government regulators, NGO staff scientists, and academics to design alternative technologies. The replacement chemicals required different machinery and supply chains to be built, often at substantial cost, and required changes in shop-floor practices. The process of industrial refashioning occurred with little impact to consumers as the costs were absorbed without disturbing markets.

The Protocol illustrates several roles played by governments—forging an agreement as a framework for cooperation; creating a platform for all actors to develop solutions; and facilitating coordinated action. The Brazilian Amazon case shows that, while government-led efforts can accelerate upscaling, reliance on government alone renders such initiatives vulnerable to political fluctuations. Actions by private companies and civil society can buffer government failures.

Commonalities among Pathways

These examples are illustrative and contain more complexities and nuances than presented above. Nonetheless, they help identify insights into strategies and conditions that have enabled market and regulatory changes that enhance sustainability. These changes often target, or are measured by the widespread adoption of new or better practices—understood broadly as including all procedures and activities in supply chains. Practices are highly scalable as they can be adopted by more actors.

However, the theory of change here does not depend solely on differences in practices. Norms and institutions must often change to enable these altered practices, and new practices, too, can lead to normative and institutional changes. Examples of these changes here include greater responsibility and accountability of large corporations for their impact throughout their supply chains, land registration of producers, and multi-stakeholder agreements. Early commitments by the most progressive actors to tackling sustainability issues were important steps in taking corporate social responsibility into the

mainstream and in institutionalizing sustainability governance[15,34]. In some cases, prefigurative activists who pushed society to reconsider the proper roles and goals of markets have been an important normative influence, as exemplified by early proponents of organic agriculture.[15]

Across the initiatives reviewed above, key players with different missions and goals—private companies, civil society, governments, and sometimes community actors—collaborated to design solutions that fit with each party's incentives and constraints.[35] They jointly invented ways to overcome the hurdles of collective action as each had to recognize their common interests as well as the valid concerns of other parties. In some cases, confrontation through naming-and-shaming campaigns was a preliminary step to collaboration, bringing corporate actors to the table.

Coalitions were able to create solutions through cooperation, rather than through central planning and control. While much of the literature on private environmental governance focuses on the incentives of companies (e.g., developing a business case, managing risks),[36] these cases demonstrate that private incentives are necessary but not sufficient. In the Brazilian Amazon and in Bolivia, as government support dried up or reversed, solutions became less effective. Company incentives can also change, due to external circumstances or to stakeholders themselves.

None of these cases was a runaway success. Even these relative success stories were hard to come by and even more challenging to sustain over the long term. For a sustainability transition to succeed at scale, a more systematic and robust approach to upscale local solutions is required.

Assessing Current and Future Strategies

Based on an analysis of past upscaling efforts and interviews of experts and practitioners, we have crafted key lessons to make future upscaling efforts more effective and overcome past shortcomings. These lessons address the importance of building lasting collaborations, finding or creating incentives, and incorporating concerns of and for developing countries. This list provides a set of criteria to assess the potential of current and planned strategies: where do new strategies satisfy these lessons or fall short?

Building Lasting Collaborations

Lesson 1. Build coalitions of multiple stakeholders around complementarities among actors. Such coalitions create synergies that can accelerate the upscaling of initiatives for sustainability. Different stakeholder groups are making various contributions in the pursuit of sustainability (Table 1). The entries in Table 1 are neither necessary nor sufficient. Various actors come together to produce desirable outcomes according to a few typical patterns of collaboration.

The complementarities between initiatives can take the form of (Figure 1): (1) Supportive and enabling government policies or NGO initiatives that facilitate the implementation of private initiatives and create legitimacy for company efforts (e.g., eco-certification schemes that facilitate implementation of sustainable sourcing commitments by agribusiness companies); (2) carrot-and-stick approaches in which governments threaten sanctions for laggards and private efforts provide incentives for progressive actors (e.g., the combination of government regulations and FSC certification for forest concession holders in Bolivia); (3) divisions of tasks between actors according to the various policy stages; e.g., governments set the policy agenda and legitimize it, companies contribute to policy implementation and enforcement, and NGOs monitor and evaluate progress, although these roles can shift and overlap over time (the Soy Moratorium in the Brazilian Amazon partially fits this pattern);[37] (4) small, pioneer efforts by progressive firms to demonstrate viability that larger public or private players with pre-existing networks then absorb and scale up (e.g., Forest Stewardship Council and Home Depot[37]).

Lesson 2. Design institutions with reasonable transaction costs and mechanisms to sustain engagement, especially at the beginning when results are slow to appear. These institutions are likely to involve hybrid governance. For example, jurisdictional approaches operate within formal administrative boundaries and seek to establish policies and practices that apply to all stakeholders concerned through a formalized collaboration between the government and other stakeholders. They rely on existing social networks that have already established trust and provide a basis for bringing together local and international actors (government, producers, buyers, civil society) to translate global commitments into change on the ground. For example, the Produce, Conserve, Include (PCI) project in the Brazilian state of Mato Grosso aims to increase the production of the state's key commodities (beef, soy, corn, and timber) while promoting forest conservation and including marginalized stakeholders.[38] PCI benefits from a supportive state government, pre-existing national environmental policies and legislation, and strong civil society engagement.

Lesson 3. Promote pre-competitive sectoral approaches to minimize the risk of displacement of the problem to another geography as solutions are implemented. Getting all the buyers in a sector to commit to sustainability efforts reduces the risk of displacement. For example, the Consumer Goods Forum pledge to reduce deforestation was formulated by the industry association rather than by individual companies. Better Cotton has benefited from similar support from a consortium of large buyers.

Lesson 4. Recognize the need for, and nurture institutional entrepreneurs who can sustain joint problem-solving and keep the overall system moving toward sustainability. These institutional entrepreneurs, as the Montreal Protocol illustrates, need the support of institutional leaders, such as CEOs of global firms and agency heads.[33] The entrepreneurs work as low-visibility facilitators who are alert to both the substance and human dynamics of problem solving. They often lead by assuring that others get credit for the solutions they implement in their networks.

Creating Incentives

Lesson 5. Tap into diverse interests—e.g., nature conservation, food security, stable employment, profitable supply chains, legality, development, human rights—to engage the multiple actors needed. Frame the issues in the terms that best resonate for the critical players. For example, fighting against illegal deforestation and corruption or promoting the health of local communities is likely to better motivate immediate action by local government actors than contributing to mitigate global climate change and biodiversity loss. One challenge is to accommodate each stakeholder in ways that do not injure or raise worries on the

Table 1. How Different Actors Contribute to the Development of the Information, Motivation, and Capacity Necessary for the Adoption of Sustainable Practices

Sector	Analytics, Information	Institutional Motive	Capacities
Business	• Measure impacts of initial production • Monitor impacts along supply chain • Provide information to consumers (retailers)	• Offer price premiums or preferences to producers who implement sustainable practices • Shift purchasing to traders who provide sustainable supply • Enlist peers and suppliers to join pre-competitive commitments	• Participate in multi-stake holder coalitions and partnerships • Experiment with and embrace technologies and practices required for sustainable supply chains • Adapt contractual relation ships and practices to accommodate sustainability practices
Civil society	• Create awareness (e.g., narratives) • Create the impetus to act (e.g., shaming) • Spur standards • Propose and design policies • Communicate technical/eco nomic feasibility to private actors	• Lead campaigns to create brand risk for companies that have not adopted sustainability commitments • Create scorecards and other measures that create ongoing accountability • Collaborate to provide tech nical assistance for implementation • Co-brand to provide credibility for sustainability commitments	• Stimulate multi-stakeholder coalitions and partnerships • Advance novel solutions and standards • Assist in opening of new mar kets and adaptations in existing markets • Provide legitimacy for novel solutions
Government	• Set policy framework for disclosure • Set information requirements for regulation and enforcement • Monitor trade, compliance, and manage public data (e.g., environmental conditions, working conditions, social indicators)	• Create regulations that enable/encourage more sustain- able production practices • Implement subsidies to defray costs of certification • Enact trade restrictions that bar illegal or unsustainable goods • Employ procurement require ments that prefer or require sourcing of sustainable goods	• Adopt policies and regulations (including those proven by multi-stakeholder initiatives) • Implement and enforce policies • Strengthen enabling conditions for sustainable production and supply chains (e.g., secure tenure, resource management, public sector purchase practices) • Support research and devel opment to advance sustainable value chains • Adapt international and sub- national policies at scales needed to move toward sustainable value chains • Enable institutional entrepreneurs to keep problem- solving network going

part of other stakeholders, as was achieved through the extensive stakeholder dialogues conducted by MSC and FSC.

Lesson 6. Identify what each actor has to gain from participation in multi-stakeholder coalitions and make a business case for private sector actors. In initiating the MSC, Unilever cited their interest in sustaining this branch of their business because fish stocks were being rapidly depleted. A campaign by Greenpeace had also created a threat to Unilever's reputation.[14] Motivations can be associated with price premiums, market access, reputational benefits, subsidies, lower taxes, or lighter bureaucracy. NGO certification can provide uniformity and credibility, thus increasing reputational benefits. Collaborations can help create institutional structures for the long term that provide a level playing field for all actors.

Lesson 7. Create accountability together with incentives. The greater the accountability for progress against commitments, the more legitimate are incentives. When required, use shame to disrupt business-as-usual and as an incentive for collaborative efforts. The Soy Moratorium in the Brazilian Amazon started with Greenpeace's naming-and-shaming campaign against Cargill and then McDonalds. Implementation of corporate zero-deforestation commitments has so far faltered, in part because companies face little accountability. Create competitive pressure around visible practices to leverage social pressure. For

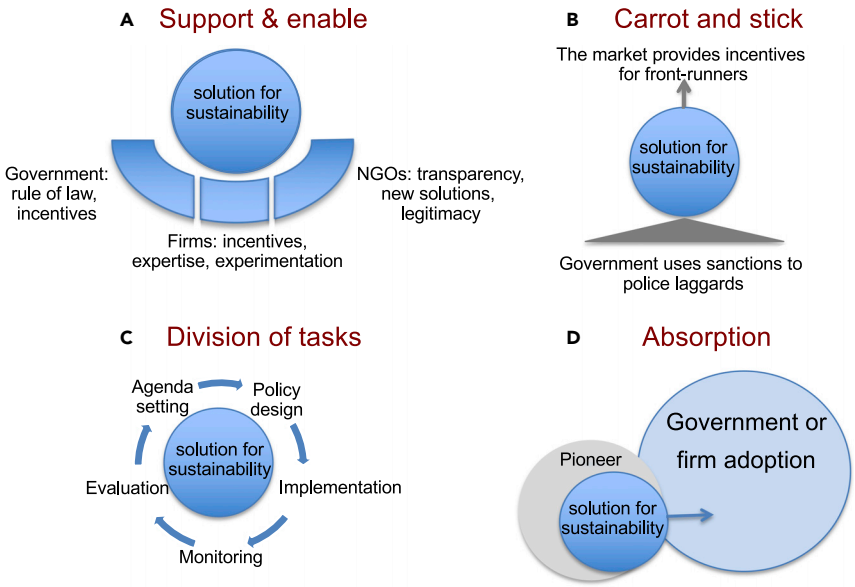

Figure 1. Typical Patterns of Collaboration for Upscaling Sustainability Solutions

(A) Supportive policies facilitate the implementation of private initiatives. (B) Governments threaten sanctions and private efforts provide incentives. (C) Different actors take responsibility for different policy stages. (D) Pioneer efforts are integrated in public or private policies.

example, competing certification schemes, such as FSC, on the one hand, and the Sustainable Forest Partnership and Program for Endorsement of Forest Certification, on the other, forced each other to constantly improve as certification organizations for sustainable forest practices.[14]

Incorporating Developing Country Concerns

Lesson 8. Take into account people in poor countries who are both producers and consumers. Some interventions for greater sustainability could have the unintended consequence of undermining market access of poor communities. Better Cotton, with its emphasis on improving the welfare of small producers as it improves sustainability, is an instructive example, with more than 1 million farmers engaged in Africa, and over 800,000 in south Asia.

Lesson 9. Stimulate demand for sustainable or healthy products in large, emerging markets. Food safety, which is highly salient among consumers in China, for example, might be the leading edge of sustainable production, as the organic agriculture movement illustrates.

Two outstanding issues require further research. First, how can sustainability initiatives lock in progress as upscaling does occur so that they are resilient to national-level political changes. Leadership and sustained commitment by all stakeholders are crucial in a highly dynamic political environment. Second, how can global sustainability initiatives gain more relevance and traction in emerging economies where costs and development imperatives are pressing concerns.

Conclusion

To upscale sustainability in a complex and globalized economy, governments, civil society, and companies need to forge deep collaborations that align diverse interests in common cause. There is no quick fix: stakeholders must build solutions together. This is especially important to drive solutions that work globally, and particularly in the context of emerging economies. Commitments need to be sustained as needs evolve. In an interconnected economy, the benefits of joint action are even greater, despite short-term interests tempting actors to abandon cooperation. Even if there are benefits from sustainable production for every stakeholder, realizing these benefits requires that a sufficient number of actors align their objectives to make sustainability the norm. Often, the benefits will only be realized if all actors act synergistically to reinforce the transition toward greater sustainability. Moving toward sustainability is a slow and fragile process that can be punctuated by phases of rapid change. All members of a coalition must have endurance and persist in their efforts. Leadership within the coalition partner organizations, and in the coalition's steering group, is critical.

Sustainability collaborations are growing in popularity and prominence. Over the past quarter century, a few sustainability efforts did reach across national boundaries and economic sectors. We should continuously observe and learn from these initiatives as stakeholders work toward upscaling sustainability solutions. Here, we identified a set of lessons to assess the potential of new strategies to promote sustainability at scale. Scaling up what works, so as to open up new economic opportunities and create new ways of governing in a globalized world, is a challenge but also an essential way forward.

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AUTHOR CONTRIBUTIONS

E.F.L. and J.L. initiated the study; all authors wrote the paper.

DECLARATION OF INTERESTS

J.L. is a former Director General of the World Wide Fund for Nature (WWF) and current board member of the Marine Stewardship Council.

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