A Roadmap for Collective Action

Inspiring Change for People and Nature

CITATION
Rare, 2024. *A Roadmap for Collective Action: Inspiring Change for People and Nature*. Arlington, VA.

ACKNOWLEDGEMENTS
This report represents the culmination of Rare's collaborative efforts and insight gained through extensive work with diverse communities and partners worldwide to advance collective action for people and nature. Many Rare team members contributed to this report, including Marcus Griswold, Larissa Hotra, Claudia Quintanilla, Rocky Sanchez Tirona, Vanessa Chumbley, and Kevin Green. We are also grateful for the invaluable feedback from Brandon Schauer and Andrew Simpson. We sincerely thank the Arthur Vining Davis Foundation for their generous support, which enabled us to undertake this vital work.

Roadmap for Collective Action

Globally, we have seen how our actions and choices can alter our climate, access to clean air and water, and biodiversity.[1] In the same ways that human development has created these impacts, humans can work to shift towards better balancing our own needs with the health of our planet.

Rare's ***Roadmap for Collective Action*** is designed to support a coordinated global shift in human behavior that addresses the increasingly clear tragedies of the commons: the land, waters, and climate that make life possible that shift. The *Roadmap* considers how everyone — from local communities to global policy frameworks — can meet the urgent need for transformative conservation and address the scale of critical environmental issues while balancing and aligning nature and people.[2]

Groups of people worldwide get asked to try and solve all sorts of problems, big and small. How do people from unique backgrounds combine their different skills and perspectives to make change happen? Collective action is an effective strategy for bringing diverse actors together to solve local to global challenges.

Collective action has been defined in many ways over the past two decades. Still, it comes down to a basic definition: bringing together a group of people who recognize shared interests or issues and intentionally agree to work together to achieve a desired outcome.[3] If successful, the desired outcome spreads throughout a group of people, leading to better results than expected when people work alone.

> "Change happens because groups of people in relationship with each other — networks, communities, ecosystems, whatever you want to call these groups of people — lean into those relationships and find ways to work together."
>
> – **Andy Stoll**, Ewing Marion Kauffman Foundation

When group members work together toward collective action, they must influence one another's efforts and hold each other accountable.[4] This is achieved through 1) a relatively high degree of structures and processes and 2) moderate to high levels of engagement between members and consistent participation among members, who include the diverse mix of stakeholders connected by a problem or challenge.

Collective Action is at the core of Rare's vision to create a "world in which the cumulative power of individual action restores and safeguards our shared waters, *lands, and climate."* Over five decades, in more than 60 countries, Rare has influenced the way millions of people care for nature. In the process, Rare and its partners have established protected areas, fostered more sustainable practices, and advanced behaviors that restore vital ecosystems and benefit the people who most depend on them.

Each Rare program shares the goal of driving collective action at the individual, local, and regional levels to address global challenges. Rare takes a collaborative approach by working with the most appropriate agents of change (e.g., influencers) and providing them with the skills and resources necessary to create change. Rare works with people for nature and with nature for people by overlaying climate impacts and solutions, empowering local communities, and supporting enhanced biodiversity and ecosystem function. Environmental issues are inextricably linked to fundamental human rights, health, and economic and social justice issues. We cannot address one threat without confronting the others.

The framework and enabling conditions in this *Roadmap for Collective Action* provide guideposts for initiating, operating, and successfully advancing collective action.

Table of Contents

Introduction

Is it a Collective Action Problem?

Before beginning a collective action initiative, project proponents should consider if they are addressing a collective action challenge.

Collective action is often used to address common pool resources (CPR), which are any material goods diminished in quantity or quality through use and are complex and/or costly to exclude others from using.[9] While narrower than the definition discussed on page 1, this is generally the definition and the types of challenges used to inform the examples in this *Roadmap*. Using CPR for short-term benefit without restraint can make it unavailable through depletion (sometimes called a 'tragedy of the commons') unless users can organize to restrain their use sustainably — this is the crux of a collective action problem.

The most common CPRs involve resources that represent low-supply, high-demand, and extractable systems that rely on group rulemaking around how to set exclusion criteria, divide the shared resource pool (e.g., pastures, fisheries, forests, irrigation systems, and aquifers) among authorized users, and contribute to maintaining (i.e., provisioning) the pool over time.[10]

Collective action can also be a highly effective means to address complex development problems, such as poverty, access to education, climate change, child mortality, access to potable

The Role of Collective Action in Community-Based Conservation

Collective Action is foundational to many community-based conservation frameworks.[5] When Indigenous and local communities govern their own lands and waters, communities have more intact forests and carbon storage potential and greater provision of essential ecosystem services than government-run protected areas.[6] This is partly due to a deep and cultural connection to the land, use of traditional ecological knowledge (e.g., prescribed burning, fishing, and hunting), and rights provision. Community-based collective action efforts can promote sustainable natural resource management through improved coordination, enforcement, compliance, and conflict resolution; facilitate social learning and the diffusion of innovations within the community and beyond; and more rapidly build trust in communities.[7]

Successful community-based projects 1) support free prior and informed consent and provide pathways for communities to seek justice; 2) provide communities access to information and the ability to participate and freely express their interests in political and decision-making processes; and 3) promote stability in supralocal governance structures, regulatory environments, recognition, and enforcement of rights.[8] Additional benefits from and strategies for community-based collective action are explored throughout this *Roadmap*.

water, corruption, etc. These types of challenges often 1) exceed the mandates of individual organizations and institutions and/or 2) are complicated by competing stakeholders' efforts that lessen their collective results due to unintended consequences and reliance on ineffective incentives.[11]

Benefits of Collective Action

When successful, collective action yields numerous co-benefits:

- **Promotes leadership across organizations and improves equity and inclusivity** within partner relationships by shifting leadership, ownership, decision-making, evaluation, and implementation to the people and institutions at the center of the challenge.
- **Enables strengthened partnerships** among local actors through co-creation and capacity strengthening that improves understanding of local systems, contexts, stakeholders, and their roles and responsibilities to affect change.
- **Establishes new norms and monitoring and sanctioning systems** among community members, which could encourage sustained resource manager engagement in the desired natural resource management behavior.
- **Avoids the conflict caused by top-down regulations** (i.e., laws and fines), which private landowners often believe are inflexible, inefficient, onerous, and undermine private property rights.
- **Ensures rules are followed** since natural resources are more likely to be conserved when resource users have collaborated to organize monitoring and enforcement activities.[12]
- **Opens the possibilities for creative synergies and innovation** from those providing the solutions across a diverse range of partners and types of knowledge.

Considerations for Large-scale Collective Action Challenges

For CPR problems at the national and/or global scale, special considerations are needed to be successful. The following characteristics can identify a large-scale collective action problem: the large number of actors involved; the problem's complexity; and the spatial and temporal distance between the actors causing and being affected by the problem.[13] Spontaneous collaboration diminishes in large-scale collective action problems because these problems often include anonymity, heterogeneity, uncertainty, and inactivity.[14] Much of this is because any changes to resources may be imperceptible to users if, for example, the CPR is very large compared to the use rate (e.g., climate change impacts caused by carbon dioxide emissions). Additional challenges include the high cost of compliance and difficulties communicating cause and effect.[15]

Prominent examples of large-scale common pool resource challenges that benefit from collective action include global air quality, ocean acidification, global biodiversity loss, and public healthcare systems during a pandemic.[16] For instance, many people using up the carbon budget do not perceive it as entailing shared consequences, leading to an asymmetrical distribution of costs and benefits. This is similar to challenges with conceptualizing water quality within nested watersheds.[17] The resources in this *Roadmap* can support overcoming these challenges.

Third-party interventions can help overcome large-scale collective action problems by 1) facilitating regulation and/or 2) supporting collective action among actors by reducing stressors and promoting enabling conditions.[18] To be successful, a third party needs to have the power or ability to influence actors, to increase cooperation either by facilitation or through various forms of sanctions or enforcement tools, and provide legitimacy in the view of key actors.[19] Organizations like Rare often take on this effort.

What Gets in the Way of Collective Action?

Often, as humans, a desire for individual thoughts and actions gets in the way of collective action because, as in many CPR challenges, individuals take more than is needed, depleting the resource for the larger community. Several factors or stressors can get in the way of successful collective action efforts.[20]

- **Anonymity** worsens as more actors are involved and is reinforced as the area of interest expands and the timeline gets longer between action and change.
- **Lack of knowledge** about other actors' choices and actions reduces transparency.
- **Lack of accountability** impacts development and following rules.

- **Heterogeneity,** such as identity differences, socioeconomic status, and power asymmetries, jeopardizes reciprocal relationships and trust building.
- **Rivalry or conflict of interest** contributes to the tragedy of the commons.
- **Uncertainty and risk** regarding consequences (e.g., lack of knowledge about the size of the shared resource) limit clarity around implementation and rule-following.
- **Emotional and cognitive limitations** when the actors have a more challenging time relating to people with whom they have no personal relations.
- **Power and agency** related to the control of resources and power dynamics, resulting in a lack of trust and inclusion of diverse voices.

The Role of Behavior Change in Collective Action

Practical and psychological barriers often thwart the best intentions to act more sustainably. The individual behaviors of people and communities cause many environmental problems. That also means that changing behaviors can help alleviate these problems. In the best cases, "win-win" scenarios reduce environmental threats while enhancing human livelihoods.[21]

Figure 1. Rare's Levers of Behavior Change Framework

Rare's Levers of Behavior Change Framework is helpful for thinking about collective action and highlights six critical levers for promoting behavior change: shifting material incentives, passing effective rules and regulations, providing actors with information, choice architecture (i.e., when we recognize an actor's values and shift the choices they have), emotional appeals, and leveraging an actor's social networks and influences.[22] More information on how to use each lever can be found at www.behavior.rare.org.

These levers can create a frame shift in how people behave to succeed in Collective Action efforts.

Enabling Conditions Framework

Certain conditions favor effective cooperative resource management. If these conditions are not met, failures can occur. Conversely, the more conditions are met, the more likely it is that collective action is successful, sustainable, and scalable.

The design of this *Roadmap* breaks down enabling conditions into components that support and sustain collective action. The enabling conditions are grouped into three types of actions: those that form the **Foundation** for effective collective action, those that form the **Structure**, and finally, those that contribute to its **Sustainability**.

Each section of the *Roadmap* provides information on how the enabling condition can be supported, common barriers faced, behavioral resources, and examples from the field. While these conditions are separate in the *Roadmap*, we recognize that the conditions often interact with each other.

Foundation

- **Resource boundaries** are clearly defined
- **Understanding of problem and goals** is shared among stakeholders
- **Communication and coordination** is functional, transparent and inclusive
- **Capacity for action** is enabled through adequate resources
- **Trust and reciprocity** are built and strengthened

Structure

- **Financial and non-financial incentives** motivate engagement
- **Inclusive and culturally relevant processes** are built and maintained
- **Rules for resource use** are contextualized to local needs and capacity

Sustainability

- **Management of rules and enforcement** centers local stakeholders' input
- **Monitoring of resource use** ensures fair and equitable accountability
- **Nested governance** facilitates aligned decision-making across scales and stakeholders
- **Scaling** is technically, economically, socially and culturally feasible and desirable

Developing and implementing a collective action process typically happens over multiple years, with many enabling conditions occurring in phases. Some conditions apply to different stages of setup, maturing, and sustaining a group focused on collective action. As this group evolves, some conditions may be more important than others.

For example, as a group of local actors moves beyond only sharing information to coordinate actions toward a common agenda, they may need more resources and consensus. Building on an existing group or network and morphing it into a collective action coalition may look entirely different than creating a group where one did not exist

before. As these processes and outputs may look different, they also may require different measurements and timelines.[23]

This Roadmap aims to provide users with an understanding of the rationale for each condition, tools to support meeting the condition, and examples of where the condition has been met in the conservation field. It also provides examples of potential roadblocks and bottlenecks to achieving these conditions.

Decision Support Tool

The *Roadmap* also includes a self-evaluation tool that gives users an understanding of where they are in the process. For instance, the "Developing Shared Understanding" section is typically one of the first conditions to be met. Still, partners may have already worked with a coalition on previous projects and may not need to spend as much time here if that coalition can be repurposed. By completing the self-evaluation, users can identify potential gaps before beginning a project, identify potential partnership needs, and assess strengths and weaknesses.

Partners and Audience

The Roadmap for Collective Action audience includes high-level decision-makers and leaders at NGOs similar to Rare; governments at multiple scales (local, regional, subnational, national, and multilateral; the private sector; and donors and foundations. It can also be used as a high-level set of guideposts for implementers such as organizational staff doing consultation work, extension agents, and community-based stakeholders.

Actor Roles in Collective Action

Different actors (and coalitions of actors) have varying degrees of power to affect change. One way of viewing roles is through an actor-network framework rather than a top-down and bottom-up framework which may set up power dynamics and result in inequities.[24] This can be achieved by placing the collective action issue at the center rather than placing the lead partner in the center. Coalitions between different types of actors — united by common interests, ideas, or values — can be vital to triggering sustainability transitions because rarely does a single actor have the necessary resources, and usually, other actors oppose transformation. Collective action is most effective and sustainable when organic and locally owned.

- **Policymakers, governments, and public authorities** are a significant focus of collective action, given their role in setting and enacting societal rules. In most contexts, government buy-in is essential for collective action to achieve progress and sustain the effort over the longer term. Public sector organizations can provide a protective environment for innovation niches to develop. In some cases, they can lend legitimacy to the effort and/or amplify the need for change, especially in enabling, sustaining, and scaling up community-based initiatives.

- **International consortiums/coalitions** (e.g., The Arctic Council) can become platforms to accommodate diverse or even conflicting interests of states and different actors, including Indigenous communities, industry representatives, and non-governmental organizations. This structure enhances the flexibility to engage several scales, from local to global, private, and public. International organizations may also coordinate different but related areas of law and address inconsistent and incompatible obligations and regulatory gaps. The powers exhibited by organizations (i.e., lawmaking, monitoring and supervision, data collection and dissemination, and dispute-settling mechanism) can counteract the challenges found in large-scale collective action problems.[25]

- **NGOs** at all levels can hold actors accountable and provide capacity, technical assistance, and access to those in power for communities while accelerating and amplifying change.

- **Citizens** forming social movements can trigger positive tipping points and start upward-scaling tipping cascades. Citizens are critical to the uptake of alternative behaviors and products.[26] Often, citizens come together to create formal structures and become seen as a trusted entity for community change.

- **Donors and funders** have a broad vision of a portfolio of local and global projects. They can help collective action efforts in seeing and setting high-level visions, sharing lessons learned and best practices, and supporting bringing non-traditional groups together. An essential part of collective action for these actors to consider is that providing financial resources can affect the power dynamics within the group, incentives for stakeholders, and other aspects that affect group cohesion. The power dynamics can be mitigated when funders take on the "blind funder" role, where funders contribute to a pooled resource available to respond to needs as they arise (e.g., the Global Environmental Facility).

- **Researchers and technological innovators** create novel alternatives, and entrepreneurs can help propel their upscaling. Experts and knowledge institutions can provide authoritative information. Universities can provide technical expertise in developing defensible, unbiased, and third-party strategies and include researchers based on critical needs, including ecologists, engineers, and social science researchers.

- **Private sector** can participate in market access, manufacturing and marketing support, and product distribution by increasing access to markets, technology, and specialized skills such as product certification, increasing the technical and financial viability of the initiative. Private firms can actively engage in innovation trajectories and help build an innovation 'ecosystem' that learns by doing.[27]

- **Financial actors** (e.g., banks) have considerable leverage to change the global economy and create supportive policies and practices for collective action.

- **Marketing expertise and media** can help tip change in public attitudes. The media can help communicate it.

Centering Social Equity and Justice

Traditionally conservation initiatives need to pay more attention to the relationships among power, wealth, and land and resource control. To the extent that these initiatives consider equity and justice, they tend to focus primarily on distributing costs and benefits; secondarily on decision-making procedures and participation; and little on recognizing the status, values, institutions, and interests of diverse peoples. Historical and present injustices undermine many of the features of a successful collective action initiative.[28]

Common results of colonization and subsequent intergenerational trauma appear in large, diverse, rapidly growing, or changing communities involved in conflict and pronounced inequality or legacies of oppression, marginalization, and dispossession.[29] These characteristics often break down the components necessary for collective action, including familiarity, frequent interaction, shared identity and purpose, reciprocity, and trust — all of which can limit social cohesion, a significant predictor of success in collective action initiatives. We have included examples of best practices throughout this *Roadmap*.

Choosing A Collective Action Partner

New partners and geographies can use this *Roadmap* to identify strengths and gaps in collective action strategies, tools, and supporting behaviors. As organizations begin this process, consider the advantages of connecting with organizations with collective action experience. There are several considerations to keep in mind:

- **Understand what your project needs to succeed.** Who has what type of interest in your challenges and planned action areas? Who can best help address your challenges as a partner? Who needs to be part of the solutions that will address your challenges?
- **Understand their local capacity** in the regions of your interest. An organization that is relatively strong at facilitating collective action in one area might take years to build the capacity, networks, and reputation necessary to function effectively in a new region.
- **Consider the level at which they implement**. Some organizations specialize in delivering technological solutions or educational campaigns to communities, while others work on creating the institutional conditions for more comprehensive change (e.g., government policy changes).

- **Understand the organization's mandate** to work in the desired setting. For instance, is the partner accepted by or working in partnership with the government? Does the partner act as a contractor paid to provide advice on behalf of another organization? What are their expectations of financial resource sharing?
- **Understand existing initiatives linked to your effort.** Are there current collective actions addressing the water resource management system conditions that generate your challenges? Is there room for a new collective action, or will this spread resources too thinly among many different efforts and dilute outcomes?

What if there's already a coalition in place?

An existing coalition is more likely to be developed organically, and its members' recognition of the need to collaborate often drives its creation. This type of starting point is generally more sustainable and effective and may also require less effort and resources to facilitate. Establishing a new coalition when one already exists can also generate confusion and misunderstanding and dilute resources and memberships. On the other hand, existing coalitions are also likely to come with their own pre-existing biases. For example, the existing coalition may have limited diversity, exclude some critical voices, have unequal power dynamics, display a lack of transparency, or use unfair processes for decision-making. However, supporting the existing coalition may still be more effective, especially if they are willing to adapt. In other cases, establishing a new collective action coalition may be the most effective way to address the development issue fairly and at scale.

Typical Lead Partners in Collective Action

Corporate Entities

Large corporate entities often need to balance profits with the need to achieve sustainability (e.g., ESG). They often need to see a clear benefit to support reputation growth and brand enhancement, which sometimes originates through social pressure. For example, when considering climate change and greenhouse gas emissions, they need to understand their contribution, address international levers (e.g., Scope 2 or 3 emissions reductions), and show demonstrable progress in reductions.

Often corporate partners move quickly and are hierarchical with evolving corporate strategies that can shift every quarter. Because of this, they might be less patient with longer-term government policies and regulations, yet they are often well-connected politically.

Organizations can partner with and provide value to corporate entities in several ways. Often corporate social responsibility (CSR) funds can be channeled through a third party to reach people and places corporations cannot get by facilitating meaningful engagement to meet community needs. Partners can often serve as advisors and subject matter experts, support measurable actions, provide connections to leadership (e.g., promoting new regulations), meet in the middle between the rapid speed businesses move and slower government policies, and help align non-profit and for-profit missions and goals. Examples include partnering with insurance providers to develop parametric insurance for coastal communities or partnering with banks to deliver financial literacy training to communities.

Corporate entities benefit from clearly stated goals, and when available quantitative information such as data, information, and factsheets, which include regular updates such as biweekly progress reports that can be integrated into existing offerings (e.g., business-to-business approach). Flexible budgets and fee-based models often work well. Because of the desire for brand-building events and materials, beneficial activities include co-sponsoring public events, symposiums, and bi-lateral convening (e.g., Conference of Parties ("COP") and climate week) that reach large numbers of people and/or their communities of interest.

Government

Governments often must meet commitments across local, national, and global reach and are responsible for executing plans and policies that could come from collective action efforts. By their nature, they are required to meet the needs of the communities they serve and often have a strong relationship with local stakeholders (though this may be negative if impacted by distrust or lack of follow-through). This often means they can support collective action by duplicating efforts in other areas and supporting innovations through technology transfer.

Governments can offer subject matter expertise, bring an understanding of a system, and support capacity building and sharing of their information, data, and tools. At times, their limitations include bureaucratic processes, a need for hard evidence and rigid requirements for reporting and monitoring, a lack of belief in community processes, restrictions on funded activities, and limited resources and management capacity. It can be challenging for elected officials to build trust and relationships in four years, especially when "legacy building" is top of mind.

Partners can provide value to government entities in several ways by bridging global to local goals and needs (e.g., localization), helping advance policy goals, increasing capacity and providing training to reduce government turnover, sharing tools and technologies, and elevating and reaching voices of communities while having more flexibility in managing resources.

Governments benefit from information that can be easily translated to policy, aligns with multiple levels of government, is linked to evidence-based research (e.g., peer-reviewed studies), and is written in "government speak."

Donors and Funders

Donors and Funders need to satisfy their mission, show a return to their Boards, and show high impact/outcomes of their funds. They often desire to be part of a broader consortium. Like governments, it can be challenging for them to pivot quickly from their strategies and programs. However, unlike governments, they often are more flexible in activities that can be funded (e.g., funding food for meetings and childcare); this allows them to amplify government funding. Many funders now support conservation's decolonization and strongly desire to invest in local communities, spending less on developed country intermediaries (Official Development Assistance investments).[30] This is especially true as

more and more individual donors are motivated by future generations and need to become more connected to the natural world.

Partners can provide value to donors and funders in several ways. Like with governments and corporations, partners of donors and funders can serve as a trusted gateway to help get more funding to the local level — partially by managing funds on behalf of local actors as an intermediary and by helping to build the capacity of local groups to be able to receive and manage funding. Through this process, partners can help foundations meet their environmental and social priorities with communities they typically do not have relationships with or access to. On the flip side, they can help local organizations navigate the funding landscape and open the door to additional funding. Similarly, partners can help funders and donors track, meet, and communicate progress towards and participation in broad international goals related to Sustainable Development Goals, National Biodiversity Strategies, and Action Plans, Nationally Determined Contributions (to climate change), and a growing commitment to integrated social equity and a rights-based approach to conservation through social safeguards and decolonization.[31]

Effective materials for funders often include individual-oriented storytelling with visual and tangible human-centered elements (e.g., videos, stories, testimonials). At the same time materials should be grounded in data and evidence and linked to clear goals. Information and briefings that show knowledge of others involved (particularly other donors), peer-relevance, and knowing they make a difference but aren't alone in providing support.

NGOs

Program partners and other large NGOs have their own missions and work plans to achieve, which includes engaging target audiences, measuring impacts of activities, and demonstrating successful work with partners. They often need to meet the needs of a diverse range of constituents. At the same time, they must meet funders' requirements, including foundations and governments, while staying true to commitments to stakeholders — a challenge to maintain their own identity while having a larger impact. To involve new NGOs in collective action, demonstrating clear actions and benefits towards existing projects and stakeholders is beneficial and helps build trust for local NGOs' consistency and reciprocity.

Partners can provide value to NGOs in several ways. NGOs can collaborate to accelerate collective action by filling in gaps in subject matter expertise, providing training to additional groups, aligning plans and targets, by sharing in impact measurement, and by showing the effectiveness of actions on the ground. For local NGOs, actions can include providing support (financial, training modules, connection to a larger pool of practitioners) for program implementation and improving accessibility to higher-profile organizations. For larger NGOs, the focus can be on exploring mission alignment.

Effective materials for other NGOs often include examples from the field and examples in short form, behavioral insights and access to expertise, data collection and impact platforms showing where programs have been effective.

CONDITION 1:

Resource Boundaries are Clearly Defined

Resource boundaries are clearly defined so that legal recognition is available at all levels (e.g., local government recognition; national policies and legislation; and advocacy through organizing).

Overview

Boundaries are junctures that distinguish people, objects, activities, institutions, and so on from each other. Clearly defined boundaries increase the likelihood that groups will self-organize to achieve collective action.[32]

Clear boundaries help users collect better information about resource conditions, facilitate monitoring and exclusion, and internalize the costs and benefits of management. When a group of organizations has a history of collaboration and a strategic plan of prioritized actions, they can increasingly acquire resources that further build their capacity. At the same time, other places with less visible or formalized boundaries may need help to gain these benefits. Tools to support boundary definitions include mapping ecological connectivity, geospatial planning tools and technology and visual aids, and demographic information.

For many natural resource management challenges, management efforts' effectiveness on one property may be influenced by actions taken on neighboring properties, making cooperation among land managers across properties often essential for achieving management goals.[33] These are ownership or rights boundaries.

Examples of Resource Boundaries

- Rare's Fish Forever program shares scientific knowledge with communities to help design marine reserve networks to protect. They develop Managed Access areas with Reserves (MA+R) for fisheries by working with the community to establish no-fishing boundaries based on community mapping.
- Property rights/land tenure on smallholder farms to understand opportunities and barriers around ownership and authority.
- Legal boundaries around requirements for solar ownership (e.g., home ownership). For example, more than 154 million people aren't able to host their solar arrays

because they lack suitable rooftop space or rent their homes.[37] That's where community solar comes in, where multiple participants own or lease shares in a mid-sized solar facility and receive credits that lower their monthly utility bills based on how much power the facility delivers to the grid. Rare's Climate Culture program is attempting to shift boundaries and support social equity by supporting community solar. Their SHINE community solar program also integrated various partners' objectives, including their desired behavior changes, the neighborhood's desire for jobs, and the US Department of Energy's desire for increased solar capacity and electrification, and thus included organizational boundaries.

- Wildlife corridors span political and property boundaries, yet once established create a long-term pathway for movement and migration. The Greater Yellowstone pronghorn corridor was established on private and public lands after receiving a critical threshold of land manager support.

While we may traditionally think of boundaries as easily visible such as property boundaries and the transition from a forest to grassland, several other boundaries are important when considering collective action. These non-resource boundaries impact the design and effectiveness of resource boundaries and any rules or regulations intended to protect resources.

- Functional boundaries between different functions within an organization, often referred to as "siloes" (e.g., wildfire agencies suppression staff versus risk mitigation staff).[34]
- Organizational boundaries created across different entities (e.g., federal, state, and local government jurisdictions) that include the diversity of missions, incentives, accountabilities, and cultures across jurisdictions and geographic scales of authority, historically stymied cooperative, coordinated collective action.[35] In the Philippines, differences in management jurisdictions between national agencies and local governments in protected areas create confusion about whether small-scale fishers hold their preferential rights in municipal waters, even though they do.
- Conceptual boundaries such as terminology and knowledge differences, known as knowledge-as-boundary.[36]

Strengthening Factors

Several barriers can get in the way of this condition, including:

- Overlapping regulations (e.g., marine protected areas under national environmental departments and municipal waters under provincial government authority);
- Non-existent Boundaries (e.g., high seas) or with contested jurisdiction (e.g., Western Sahara);
- Unclear sense of scale; and
- Unclear locus of control and impact of change (e.g., people involved in climate change don't see the impacts of positive behavior).

The strengthening factors below can help overcome these barriers.

Boundaries are clearly defined, visible, and include the area of influence. An example is marking the edges of sensitive habitats with clear signs, tape, buoys, and/or fencing as a visible reminder.

Community-based rights are recognized and part of the collective action process. The question of ownership is often a concern, as is the need to include community and Indigenous voices in developing boundary definitions.[38]

Rights inform the boundaries that can be created and driven by communities and initiatives that demonstrate their effectiveness as land managers. Marginalized people often have difficulty making their voices heard and strengthening their property rights improves their bargaining positions. For example, enhancing rights to even relatively small homestead plots can increase food security by allowing women to grow gardens; rights to common property often provide insurance for people experiencing poverty. Many countries are now adopting policies to devolve the management of forests, fisheries, irrigation, watersheds, or rangelands to local communities or to develop some form of co-management between the state and communities.[39]

Rights do not necessarily imply full ownership and the sole authority to use and dispose of a resource. Individuals, families, groups, or even the state often hold overlapping use and decision-making rights. Examples include use rights (e.g., right to access, withdraw and/or exploit a resource) and control rights (e.g., rights to manage, exclude, and/or alienate from a resource). [40]

Equitable Boundaries: Indigenous and Community-Conserved Areas

For Indigenous communities, a "bottom-up" approach to tenure and ecosystem management can be achieved by creating their own indigenous and community conserved area (ICCA). A key element of most ICCAs is that local resource users create them to serve a local purpose, distinguishing them from state-created protected areas or parks that arise from a vision conceived at a larger scale and not always with local consultation.

The Tagbanwa people of the Philippines manage the ecosystem of Coron Island, restricting the use of forest resources for domestic purposes only and prohibiting foreign access to most of the island's sacred lakes, except for religious and cultural purposes. The ICCA Registry website is an online information platform where communities provide data, case studies, maps, photos, and stories on featured ICCAs worldwide.

Policies facilitate boundary work, including national funding for collaborative restoration work, international climate policy and water policy, national fire planning, and legislation specifically creating a boundary organization.[41] This also includes a need for a functional government across national and local levels and a tenure record and management system that can be used as the basis for changes in boundaries. For instance, for Rare's Fish Forever, in-country policies secure legal recognition of Managed Access areas with Reserves (MA+R) following co-designing them with the coastal community. This factor is especially helpful for boundaries that change over time and space, such as water rights that change by season, seniority, water availability, and customary rangeland management systems that depend on weather and social relationships.

Joint reference points (e.g., classifications, standards) and clear definitions of resources for communication and sharing across boundaries that are broad enough to allow shared meaning and flexible interpretation among actors from both sides of a border. These include concrete objects such as maps, models, or datasets and instruments such as agreements, MOUs, or organizational charters.[42] Systems mapping can be used to identify the boundary of a complex issue and thus the geography, factors, actors, interconnections, influences, and outcomes internal and external to the edge.[43]

Scaling and using boundary-spanning processes focuses on communication and coordination activities performed by individuals within and between organizations to integrate activities across multiple cultural, institutional, and organizational contexts.[44] Actions include (1) translating across differences or facilitating cross-field understanding;

(2) aligning among differences or seeking complementarities between them; and (3) decentering differences or identifying shared space/common ground.[45] Boundary spanning does not demand consensus but allows different social worlds to intersect while maintaining their own functionalities.[46] Social media can assist with boundary spanning using automated social networking and multiple media and visuals, especially during crisis events.[47]

Fence Boundaries, Colonization, and Collective Action

Installing fences is an excellent example of rapid collective action with strong components of adopting behaviors from neighbors, social equity impacts, and adoption by governance across municipal governments. Fences can be treated as social agreements and divisions in social relationships from fencing can become ecologically meaningful, such as dissociating people from their connection to nature and cultural practices.[48] Traditional unfenced pastoral boundaries tended to be "fuzzy" and flexible, with frequent exchange of information and resource sharing among landowners. However, as fences harden boundaries, social relationships dissipate, and the capacity to tolerate disturbances weakens, resulting in rangeland deterioration and system resilience decline.[49] The physical form of fencing means it can easily self-generate; erecting fencing around the neighboring plot then requires less material and intellectual input, encouraging neighbors also to install fences.[50] As more fences are built, opportunities for collaboration decrease and a tipping point is reached where the proliferation of fence boundaries becomes unstoppable. Government policy often then adapts by encouraging or requiring more fences.[51] With an altered perception of tenure and community, removing one fence in a fully fenced landscape does little to incentivize others to do the same.

Fencing has also created social inequities. Where ownership, property, and territories are based on long-term development of social relations, such as in many Indigenous societies, fences are used sparingly, if at all. The lack of fences may have made it easier for European colonists to justify seizing Indigenous lands. The native inhabitants were "living off nature," and fenceless land was "free for the taking."[52] In Namaqualand, South Africa, during the 1950s, fenced "white" and "colored" farms under apartheid policies diverged into landscapes that supported different vegetation communities noticeable even today, a pattern repeated at the Norway–Finland, U.S.–Mexico, and China–Mongolia borders.[53]

CONDITION 2:

Understanding of Problem and Goals is Shared Among Stakeholders

Shared understanding includes a definition of the problem, theory of change, strategy for accomplishing goals, decision processes, and common agenda. For this condition, it's important to note that collaborations are not de facto synergistic, but their success is predicated on some effort to align values, goals, and purpose.

Overview

If members of different groups come together for the same purpose, their beliefs about their group's efficacy could increase and, with it, their sense of shared identity. Shared understanding includes a joint problem definition, theory of change, strategy for accomplishing goals, decision processes, and common agenda. For this condition, it's important to note that collaborations are not de facto synergistic, but their success is predicated on some effort to align values, goals, and purpose.

Requirements include[54]:

- Establishing clarity among all participants regarding the engagement's scope, goals, roles, decision processes, and time and resource commitments.
- Clearly understanding and agreeing to these expectations up front
- An understanding of the extent of common ground sought among participants; the degree of independent decision-making maintained among participants; the expectations for joint action and responsiveness; and the experience and resources needed for collective action.

The Power of Equity in Goal Setting

The joint participation of advantaged and disadvantaged groups under the same cause could also influence hope for change. When hope is high, it can influence efficacy beliefs and motivate collective action.[55] In disadvantaged groups, perception of social support increases the efficacy beliefs necessary to undertake actions to change their circumstances.[56] Similarly, for advantaged groups, perceived resources that include psychological, social, and political assets also predict their participation in collective action.[57] Lastly, equity in goal setting often includes shared language and meeting people where they are. For example, the Native Hawaiian expression I ola´oe, i ola mākou nei ("When you thrive, so too do we," said between people and their natural environment) exemplifies the idea that care for the environment, which encompasses living and nonliving elements in the natural system, will, in turn, lead to care for all occupants of that system, whether human or nonhuman. From this, shared goal setting can be supported through messages of hope and inclusion of lived experiences in setting goals.

In the southwest U.S., the red rock landscape surrounding Bears Ears is the sacred ancestral lands of the Navajo Nation (Diné), Hopi Tribe, Ute Mountain Ute Tribe, Ute Indian Tribe, and the Pueblo of Zuni, among others. After experiencing decades of injustices in decision-making and extractive land use practices, collaboration with the federal government shifted positively. Through the Bears Ears InterTribal Coalition, the tribes formed a coalition to center Indigenous priorities and voices to protect and co-manage their sacred landscape and collaborated with conservation groups who shifted their approach to support needs and issues identified by the tribes – to one that places the tribes at the center of communication, combines western and indigenous science, and rethinks public lands management as a place to heal communities and enhance social bonds.

Strengthening Factors

Several barriers can get in the way of this condition, including:

- Moving too fast with too rigid of a governance structure too early on can make actors diverge from the group and act unilaterally rather than collectively.[58] As a result, rivalry or conflict of interest can often hamper collective action and contribute to the tragedy of the commons.[59]
- Miscommunication due to variation in knowledge, experience, lexicon, needs, interests, perspectives, and seemingly misaligned organizational goals can impede the development of shared goals. [60]
- Lack of political buy-in can occur when 1) political context doesn't support partnerships by government with civil society organizations; 2) narratives about historical access to resources differ; 3) a partner (e.g., government) perceives that the coalition is duplicating its efforts or supplanting its role.

The strengthening factors below can help overcome these barriers. Tools to support these include community consultations, solutions and insight mapping, learning summits, value chain analysis, knowledge management systems, audience profiles, Social Network Analysis, games, and workshops. Network analysis can help to spot key influencers in the network and guide you in structuring your hub or backbone organization. Often this work is led by an external facilitator or implementer.

Formalizing expectations drives further clarity and enables the convener or neutral facilitator (e.g., local campaign manager), if needed, to fall back on them if concerns arise during the engagement. For a coalition to function effectively, there should be clear expectations for all members, not just those in leadership or decision-making positions. This might include attendance or contribution requirements, documented scopes of work, ground rules, group charters, memorandums of understanding, and statements of commitment.

Shared identity can be achieved by articulating and finding similarities and differences among vision, values, structures and processes, purpose, and thoughts about the nature of the collaboration and knowledge transfer.[61] Adaptive management is an important component of this so that the work can remain nimble to changes in the environment, politics, and/or bringing in new partners.

Desire for cooperation can be supported by highlighting pre-existing relationships and taking advantage of behavioral aspects, including Fear of

Shared Perspectives Through Gaming

Fish Forever's Fish Game creates a rapid opportunity for fishers to see real world consequences of actions and how their fishing activities affect them and others, helping groups get on the same page quickly. People can experience and learn about fishers' perspectives, the impacts of reserves and managed access on the ability to catch fish, and the financial impacts at fish markets.

Designating a Good Implementer

Lack of good leadership training can put a halt to developing shared goals. Aspects of an effective implementer can overcome challenges when they have the characteristics below:

- Ability to balance between process and outcomes;
- Ability to foster group cohesion;
- Has energy, interpersonal skills, connections, or reputation and cares deeply about the results on the shared problem;
- Able to be a neutral facilitator, including skills in conflict resolution, active listening, and empathy; and
- Well versed in the perspectives of each group member type and able to bridge between them.

Missing Out (FOMO), risk perception, and community concern (e.g., neighbors believe risks are also present).

Centering the community through community-led, co-creation, and inclusive processes that include respect among stakeholders, influencers, and community buy-in for decision-making. This includes considering how to meet partners where they are, creating the appropriate time and space for constructive debate and feedback, and creating clear communication channels.

Co-benefits of solutions are clear and support members in deriving value or benefit through their participation, such as access to training, mentoring, and capacity building; knowledge and information sharing between partners; access and ability to engage with the Government (or other decision-makers); and/or the potential to influence policy.

External-party dependence is understood: As the dependence on external parties for addressing collection action increases, the need for establishing shared responsibility and coordinated joint action will also increase. Higher dependency equates to the need for more engaged forms of collective action; thus, the demands will be greater on the external parties. [63]

Risk Perception and Private Forest Landowners

Research from California and Oregon indicates that it is important for forest landowners to understand how wildfire operates, how their actions affect it, and that acting collectively to reduce wildfire risk will have a better outcome than acting individually or in an uncoordinated fashion in order to engage them in collective action to reduce wildfire risk at the landscape level, across ownership boundaries. Risk perception also critically influences wildfire risk reduction behavior among landowners and homeowners. Family forest owners who were part of collective action efforts expressed a high level of concern about wildfire occurring on their property or spreading to their property from adjacent ownerships. They also believed that fuels reduction on their ownerships would be more effective if their neighbors also reduced fuels on their property.[62]

When Should You Add a Partner?

The following questions can help determine when to add a partner and who the partner might be.

- What degree of direct control is held by external parties over the conditions that affect achieving the stated objectives?
- What degree of leverage is held by other parties for the decisions needed to achieve the stated objectives?
- What degree of dependence do the stated objectives have on the actions and resources of other parties? (e.g., is water conservation behavior by other industries, community residents, or other water users needed to support access to clean water?)
- What degree of risk is present in the absence of potential collective action efforts (essentially, is acting alone an option)? (e.g., would increasing the withdrawal rate from groundwater without consultation with the local community generate a perception of abuse or preferential treatment?)

Assessing the Level of Engagement Needed

Stakeholder engagement is a foundational element of developing shared goals. The level of engagement is contingent on the size of the collective action problem and its complexity of actors, geography, and culture. Below are examples of the spectrum of engagement levels and what it means to governance and resource commitment.[64]

Level 1: Informative collective action requires the fewest resources, has the lowest expectations of group members, and allows for the highest level of independence for group members. Sharing information focuses on coordinating sharing to expand knowledge and increase transparency, familiarity, and trust among interested parties. Shared information might include general organizational plans and priorities, privately collected data or analyses, or specific monitoring, operational, or management practices.

Level 2: For consultative collective action resource commitment can be kept low along with expectations of joint goals. Seeking advice focuses on convening specific interested parties to exchange ideas and expertise and to create a shared understanding of needs, interests, and challenges to enable informed, independent decision-making by all parties. Consensus among interested parties is optional.

Level 3: Collaborative collective action by pursuing common objectives seeks to move interested parties closer together and reflects a belief that finding common ground, establishing common objectives, and sharing implementation responsibilities hold the potential to increase both individual and collective effectiveness. While consensus is desirable and decision-making remains independent of each member, members become more committed to a common goal.

Level 4: Integrative collective action is the most resource intense and is focused on aligning interests, resources, decision making, and coordinated actions. Interested parties are typically formally convened or have a formal joint structure—for example, as a partnership governed by a memorandum of understanding. Consensus is highly desired, created through a formal governing mechanism, and involves negotiation to discover areas of shared interest.

CONDITION 3:

Communication and Coordination is Functional, Transparent, and Inclusive

Communication and coordination include a mix of partners motivated to share their knowledge and are open to learning.

Overview

Communication and coordination include a diversity of partners motivated to share their knowledge and open to learning. Effective, engaged dialogue among participants requires careful cultivation and attention to process-related details. By creating forums in which the engaged parties can interact comfortably, the convener/facilitator will continue to build a sense of candid information sharing and trust with the participants.[65] At the outset of the effort, explore with participants their preferred modes of ongoing communication and interaction.

Ongoing communication must be tailored to the avenues through which participants are accustomed to receiving information, which will likely vary by participant type. Communication within the group is essential to align goals, inspire action, and resolve disputes. Communication and knowledge exchange outside the group enables learning and conveys the rationale and benefits of the group's actions to the surrounding community, government, and other stakeholders.

Strengthening Factors

Several barriers can get in the way of this condition, including:

- ***Lack of knowledge*** about other actors' choices and actions decreases cooperative behavior and can result in siloing.[66]
- ***Lack of accountability*** increases significantly with a growing number of actors and larger spatial and temporal distances, including frequent staff turnover.[67]
- ***Unwillingness of members to give up control*** over management decision-making and existing power dynamics, sometimes due to legal requirements and bureaucratic processes.
- ***Time lags in implementation*** can generate uncertainty and lack of trust, undermining coordination.

The strengthening factors below can help overcome these barriers. Tools to support these include participatory mapping, which promotes mutual trust, a shared sense of mission, and a mutual understanding of the resources involved and the potential benefits of better management.[68]

Dialogue is effective and tailored to preferred communication avenues, messages are simple and easy to share, and the initiative is a trusted source of information with defined methods, tools, cadence, and communication rituals. Communications considerations include cultural and language needs that may require producing materials in response to specific participant differences. This will help to create a common knowledge base from which to work.[69]

Neutral ground for meetings, particularly early in the collective action process with multiple means of regular communication.

Clear roles and responsibilities. Members are transparent and accountable, making actions easily known to all, with understanding from everyone's perspective. This should also include a means to overcome misses/failures in communications and inclusion and a process for implementing improvements.

Social learning and skills transfer focused on networking, knowledge exchange, technology and media to change attitudes, communicate incentives, catalyze collective action, and replicate best practices. Tools include peer-to-peer exchange to reduce uptake time of good practices in resource management, governance, and business development and empowering successful groups to share with others through "seeing is believing." Social learning and skills transfer can substitute for formal extension or outreach efforts.

Communication is tailored to local/state/national level decision-makers recognizing that communication has driven macro-level behavior change as evidenced through changes in environment and development policy at the state level, replication of successful community models across different sectors and ecosystems, and the ability to access funding from donors.[70] Communication with donors, government agencies, and politicians through newsletters, articles, and visits create vertical linkages with those in a position to provide financial, technical, or political support.

CONDITION 4:

Capacity for Action is Enabled Through Adequate Resources

The initiative includes members with the authority to make changes, local skilled implementers, knowledge transfer (e.g., access to comprehensive data used in decision-making), adequate resources (e.g., budget and time), and motivated, connected, and empathetic leadership.

Overview

Capacity deficiencies typically result from a lack of technical expertise or financial wherewithal to engage as an equal and effective participant in the collective action and a lack adequate leadership and authority.

More engaged forms of collective action will require high time commitments, financial resources, and responsiveness. An organization's capacity to be responsive to the interests and needs of other participants must be aligned with the collective action engagement selected to be sustainable. Capacity building is also the point where an information-sharing platform might be needed to amplify the work.

Capacity and Social Equity

Inadequate capacity can create an inequitable process with asymmetrical participant influence (a potential power imbalance) where certain parties cannot effectively represent their needs, interests, and solutions. This low capacity can be due to a lack of resources to travel to meetings or a lack of awareness that the process is taking place, due to limited access to communication. To address this imbalance, additional funds and outreach efforts may be needed for equal participation by hard-to-reach communities. Such imbalances will require affirmative action on the part of the collective action convener to bring resources to the table, making them available on an independent basis (e.g., providing financial help to a community organization to hire its own technical consultant).

Strengthening Factors

A number of barriers can get in the way of this condition, including a lack of empathetic leadership, bureaucracy, transparency and limited funding and/or a sustainable resource commitment. Often there needs to be more funding to support civil society organizations and governments to build the capacity to legally and operationally engage in collective action, limited by staff capacity and/or limited authority to partner with civil society organizations. The strengthening factors below can help overcome these barriers.

Adequate internal and external capacity is needed for collective action to work. Below are questions to ask about the capacity of internal and external stakeholders.

Internal interest and capacity include the basics of whether your organization can support effective involvement at the desired level of engagement. Low interest (buy-in) among key staff, limited time or financial resources, or a strong organizational culture of independent decision-making and control can substantially inhibit the available engagement options.

External-party interest and capacity: As more engaged levels of collective action are desired, demands on the interest and capacity of external parties will be greater. Low interest or low capacity will not support, for example, collaborative collective action, and will signal a need to cultivate interest or capacity if that's a desired outcome.[71]

Adequate budget support and time commitment, and simultaneous funding to different actors.[72] An example is the Official Development Assistance (ODA) or other philanthropic funding that supports CSOs and governments to invest in the capacities, tools, and systems needed to operate legally and effectively in the collective action space. ODA is government aid designed to promote developing countries' economic development and welfare, such as through the United Nations or the World Bank, which can include grants or technical assistance. Seed grants can bring big results by acting as catalysts for group activities (e.g., Meloy Fund). Often synergies can be had by aligning public and private funding (e.g., private funders are often more flexible in supporting inclusiveness such as paying for childcare or food for community participants).

Generation of new, shared knowledge and the ability to capture results from an action taken and subsequent corrective action.[73] At the initial stages of collective action, having knowledge asymmetries can lead to more knowledge sharing. For example, when

multiple community groups are involved in a dialogue, different types of knowledge will be represented, so a method must be in place to ensure the understanding of each party by the others. In areas where more than one language is spoken, effective capacity building would include securing appropriate translators. Other examples of differences in knowledge include economic, academic, environmental, policy, and practitioners.

Capacity for Indigenous and Local Knowledge

The value of including Indigenous and local knowledge (ILK) in the management and governance of landscapes tends to be overlooked and undervalued. The Intergovernmental Panel on Biodiversity and Ecosystem Service (IPBES) definitions of ILK include traditional ecological knowledge, cultural knowledge, local knowledge, traditional knowledge folk knowledge, and indigenous ecological knowledge. Through practice (seeing, doing, devising solutions, applying proven successful institutions, principles, and frameworks), knowledge is transmitted across generations, and problems are resolved based on experiences accumulated through centuries of people-nature interactions. One tool utilized for engagement with ILK is consultation, but often this is only the first step to building knowledge-sharing and co-production capacity. To go deeper in partnership with communities, time and capacity are needed to address and support shared knowledge exchange and alignment of definitions, respect for rights, support for care and reciprocity, and for understanding respectful ways of using and sharing ILK.

Examples include[75]:

- The Circumpolar Biodiversity Monitoring Program (CBMP; circling the Arctic) is a cornerstone program of the conservation of Arctic Flora and Fauna Working Group of the Arctic Council. The CBMP is an international network of scientists, governments, Indigenous organizations and conservation groups working to harmonize and integrate efforts to monitor the Arctic's living resources. The CBMP recognizes the importance of utilizing Indigenous Knowledge and Local Knowledge within its activities and strives to improve inclusion of Indigenous Knowledge within CBMP through a co-production of knowledge approach to inform better decision-making.
- Allowing sufficient time in the process for Australian Aboriginal community members to build trust and identify the Daly River's culturally important ecological values.
- Providing support for indigenous communities to research their own Customary Tenure Systems to ensure benefits from REDD (Reducing Emissions from Deforestation and Degradation).

Strengths, roles, and capacity of each partner are articulated and tracked/ recognized. The perceived value of the group is positive and effective, partnerships fill capacity gaps, skillsets are leveraged, and a local workforce with desired skills is present. Roles should be tailored to the needs of the program and desired outcomes, which often

requires specific training (e.g., training government staff in equitable community engagement). Developing broad partnerships to meet critical capacity gaps and prioritizing the training of project staff are also key traits that enable this durability and resistance to ecological, social, and economic shocks.[74]

Legitimate, capable, and diverse leadership aligned with top leadership and distributed leadership. Leaders should have access to authorities that make change, decision-making, and innovation possible and should possess experience, energy, a positive reputation, and the ability to adapt. Strong community leadership and institutions have been associated with positive collective action outcomes, and capacity-building efforts focused on leaders can yield positive impacts.[76]

Funding and political will for engagement. Greater investment in capacity-building efforts that foster community engagement and representation in decision-making processes may be necessary where environmental democracy and voice and accountability are low.

Relationships with intermediary support organizations are fostered and are equitable and reciprocal. Intermediary support organizations carry out some of the most effective work in local capacity development. These NGOs have credibility at the local level but maintain high-level contacts and organizational skills that local groups often lack, allowing them to operate in the space between the state and local levels. Initially, local initiatives require

Balanced Leadership

Strong leaders can sometimes become a center of gravity that dominates decision-making and discourages free and open exchange and participation, leading to members' unwillingness to give up control over management decision-making. Yet, the effort is vulnerable to failure if leaders either leave or 'burn out' or other staff turnover. Support for balanced leadership includes:

- Recognition leadership does not equal power, but that power dynamics should be addressed;
- Opportunities for the coalition to select the leader, even if they are not the project leader or funder; and
- Ability and desire to govern with transparent and equitable processes.

A campaign led by the World Wildlife Fund and Rare helped develop official clubs for fishers in Mongolia to learn and teach one another about sustainable methods for catching taimen, a declining species in the area. These fishers then became seen as leaders and set new norms for the community about catch-and-release practices. After only two years, the program led to a 50 percent increase in the taimen population as well as huge gains in awareness about local regulations.[77]

various support services, from business and financial services to technology training and legal help.[78] Their interventions and training programs are typically adapted to the needs of local groups in ways that government agencies and outside groups often find hard to achieve.[79] Characteristics of equitable intermediaries include engaging often and early with communities by addressing community needs and goals; investing in getting to know the organizations and communities they support; recruiting and maintaining local staff; empowering the communities by giving them skills to have their own voice and to grow as organizations (e.g., training in business skills and fundraising); and embedding local and indigenous knowledge and skills in decision making processes and implementation.

Local capacity is foundational to success and strengthening human capital through training or technical assistance interventions has significant positive effects on collective action outcomes.[80]

Extension Agents as Key Intermediaries

Extension agents serve as a bridge for knowledge transfer and have a suite of tools to reach communities at scale. Two key examples related to collective action include agricultural extension agents and community solar technical assistance providers.

Agricultural extension agents work globally at the interface of science and technology and as a bridge between farmers and policies, often earning the role of a farmer's most trusted advisor. [81] Rare's regenerative agriculture program strengthens extension agents' skills to train farmers to adopt more regenerative and sustainable land-use practices.[82] In Colombia, Rare works to empower farmers to shift to regenerative agriculture using the knowledge that combining social proof (where farmers observe their peers adopting the targeted practices) and social pressure (where farmers perceive a behavior as one expected in their community) can shift conservation practices at the landscape scale. Rare trains extension agents in this novel behavioral approach, with each reaching as many as 60 farmers.

Residential distributed solar energy will lower energy costs for families, create good-quality jobs in communities left behind, advance environmental justice, and tackle the climate crisis. Yet less than half of U.S. community solar projects have any participation from low-income households.[83] The role of technical assistance providers such as the Department of Energy's SolSmart program, GRID Alternatives, and New York's Community Power is to make the transition to solar easy and reduce barriers in low-income communities while empowering a network of trusted solar technicians through job training, support for permitting and inspection and planning and zoning, and market development.

Support for self-efficacy (also known as human agency) is the belief in one's capabilities to organize and act to achieve a desired goal that motivates people to act for collective social and ecological aims.[84] Its effectiveness increases as individuals move towards collective efficiency and as a feedback loop is created between self-efficacy and groups of people working towards a goal.

Self-Efficacy and Flood Risks

Belief in a community's ability to successfully manage disaster response cushions psychological distress in a disaster's aftermath under conditions of high resource loss. Self-efficacy is one of the most powerful predictors (along with risk perception) of risk mitigation behavior for communities that have experienced flooding.[85] Self-efficacy captures how a person perceives their general ability to protect themselves against a certain threat.[86] A person who is afraid of flooding, believes that their flood risk is high, and feels capable of reducing their risk through personal efforts is more likely to take action such as installing flood barriers or purchasing flood insurance.[87] Households holding stronger expectations about receiving support during a disaster feel more capable of taking measures to reduce disaster risks at their own properties.[88] A combination of high group efficacy (which increases risk perception and fear) and social support (which increases self-efficacy) supports collective action. [89]

CONDITION 5:

Trust and Reciprocity are Built and Strengthened

Trust and reciprocity involve established foundations of trust and credibility within the network of members and shared acceptance of diverse perspectives. Aspects that support this include 1) pre-existing relationships or partnerships, 2) recognition of rights of members to organize and have voice, 3) accessible options for conflict resolution and a structured grievance mechanism, 4) transparent goals and timely sharing of information, and 5) support for adaptive processes.

Overview

Trust and reciprocity involve established foundations of trust and credibility within the network of members and shared acceptance of diverse perspectives. Trust lowers transaction costs and binds stakeholders together for successful collective action.[90] Relationships can range from high trust and cooperation to low trust and hostility, and these conditions will affect at least the starting point for collective action activities.

Aspects that support trust include 1) pre-existing relationships or partnerships that support equitable and transparent decision-making, 2) recognition of members' rights to organize and have voice, 3) easy options for conflict resolution and a structured grievance mechanism, 4) transparent goals and timely sharing of information, and 5) support for adaptive processes.

Fostering trust depends largely on stakeholders communicating face to face, reciprocating intentions and following through with these commitments. Accordingly, trust is best fostered initially in collective action by undertaking numerous activities considered 'easy wins' at an early stage.

Distrust Feedback Loop

Well-functioning political institutions can foster trust and social norms that in turn can facilitate cooperation, with what is called high "collective action capital." This is important when some behaviors are extremely hard to regulate or monitor (e.g., washing hands during a pandemic). Overly restrictive policies can backfire or crowd out existing norms.[91] If people start breaking the rules, there is an elevated risk that increasingly harsher policies enacted in response will have negative effects on the levels of trust, thus becoming a vicious cycle, as trust is hard to build but rather easy to ruin. A path forward exists when governments are responsive to the demands of diverse groups in society.

Strengthening Factors

Several barriers can get in the way of this condition, including anonymity, a legacy of injustice and oppression, limited coordination and time lags, and unintended consequences. For example, anonymity impacts worsen as more actors are involved, as the area of interest expands, and the timeline gets longer between action and change; it can also worsen with corruption.[92]

The strengthening factors below can help overcome these barriers. Tools to support these include participatory methodologies and supportive unbiased facilitation.

An intentional and stepwise approach (e.g., beginning with basic information sharing and a commitment to transparency that can dispel misperceptions) with formal/informal agreements (e.g., MOUs).[93]

The initiative is a trusted source of information, with trusted partners and messengers recruited and trained, who have a history of working with the community you would like to engage.[94] Support includes recognized experts to serve as a bridge between stakeholders, devolved authority, and diverse management bodies. When stakeholders are missed it's possible to slot in new communities in the process but is delicate. Finding trusted communications channels for hard-to-reach influencers is important to help mitigate this. This can also help address trust "bottlenecks" associated with a person or organization.

Pride on Our Plates: Trusted Messengers in the Restaurant Industry

Each year, more than 38 million tons of food is lost or wasted in China. Most of this food is wasted by consumers, with restaurants generating more waste than that coming from homes and canteens, or stores, combined. Curbing food waste in China can help China's food service providers reduce their business costs, meet growing consumer and political demand for more sustainable operations throughout the country, and protect the environment at the same time. Food service providers are starting to understand these benefits and take action. Through the Pride on Our Plates Program, Rare, WWF and the One Planet Foundation are helping restaurants reduce waste. The project partners closely with nationally and locally focused hospitality associations, whose knowledge in day-to-day restaurant operations coupled with a deep understanding of a region's cuisine helps to establish trust with local restaurants, who are then engaged through trainings and a pilot program to practice food waste reduction strategies. Through this collective action the partners are seeking change through a Food Waste Policy Proposal that supports national, regional, and local governments in tackling food waste across China.[95]

Strong partnerships and peer-to-peer exchange opportunities that support shared understanding, mutual respect and trust, information-sharing, advocacy, and resource pooling. Social trust and equity are critical for empowering communities and defining how they ultimately choose to adopt rules and goals (and remove barriers to that change).

Poaching and Community Outreach in Thailand

World Wildlife Fund Thailand and Thailand's Department of National Parks ran a community outreach program to reduce poaching in and around the Kuiburi National Park. Program designers identified six psychosocial factors known to influence behavior: trust, public support, motivation, ethics, self-efficacy, and confidence. Based on these findings, they built a program to create the opportunity for the wider community to organize and collectively express that poaching was detrimental to their livelihoods and that they had the power to act against it. By 2011, poaching pressure had dropped by a factor of four across the park, with five of the six focal species increasing in abundance across monitoring sites. Just as importantly, by the intervention's conclusion, 90.5% of the community supported wildlife recovery. Community members' top reasons for the decline in poaching was park outreach rather than patrolling. Through the collective action of their outreach events, the program created a new norm within the community of poaching being viewed negatively, providing a social rather than formal deterrent.

Signal internal commitment to collective action goals to recognize the responsibility for safeguarding the resource.

Innovation and adaptive management that support adaptive capacity through trial and error and transparent communication of learnings; the latter includes understanding how they were or were not used and/or underpinned by social cohesion and group trust, and understanding that failure is a part of getting to success.[96]

Adaptive Management: Blue Crabs in the Philippines

Adaptive management includes a flexible approach, an extensive stakeholder discovery effort, beta testing solutions, and responding quickly and iteratively with constant testing when an idea fails (e.g., returning to a list of proposed solutions).

During the systems analysis in the Philippines, Rare staff realized that the target actor was not the traditional fisher. Blue crab processors were key influencers and resource holders. Rare then created a new campaign and researched the value chain. Through adaptive management, Rare staff realized crab processors were also experiencing scarcity and repurposed their existing change program.

Maintenance of fairness and lack of free riding by working to remove competitive behaviors, legitimize user rights, support bidirectional trust between stakeholder types (e.g., community and government), and ensure community input is acknowledged and respected.

Setting realistic expectations that provide adequate stakeholder value, such as committing to do small things and then doing them.[97] This includes ensuring people feel like the work is a public service, it's the right decision for the community, and partners and optics are considered so that mission focused boundaries are recognized.

Acknowledging power dynamics between actors and mediating them. Trust building activities can increase communication and willingness to adopt sustainable use levels among members of a natural resource group.[98] Resource consideration discussions should be held in an open, public forum where citizen participation is possible. However, one key consideration is the impact of perceived loss of power, which can be partially offset by repurposing someone's role to benefit the group (e.g., providing training and mentoring).

Building Government Trust

Through Rare's Fish Forever program, lessons learned on building trust with government agencies include:

- Messages clearly conveyed across all levels of Rare and government.
- Messages that can be transmitted by the trusted messenger, even if they are not the decisionmaker.
- Global meetings and meetings with Ministries set up a fear of missing out (FOMO) for other authorities in helping to scale projects or be seen as a good person or innovative leader.
- Bidirectional engagement so that the government can trust the community to manage resources and the community trusts the government; at first, sometimes these need to happen separately.
- Train a community in government engagement and the government in equitable engagement and community participation.

CONDITION 6:

Financial and Non-financial Incentives Motivate Engagement

Members of the group have incentives (motivations, pressures) to join, and they understand the benefits that can be expected from undertaking a new activity and how these compare to the costs.

Overview

Bringing together actors to find solutions to their collective action problems depends on an ability to identify and transform the incentives underlying the various actors' interests in providing a specific good or service to achieve the collective action goals.

Incentives depend on internal motivations (e.g., material gain, social advancement, reducing risk, spiritual gain) and the opportunities and constraints arising from relationships with others. Sustainable incentives often involve positive shifts in public perception, political will, government policies, and business practices.

Removing the Intermediary for Community Prosperity

By overcoming the logistical and financial difficulties presented by uneven or inequitable local economies, rural producers have reached urban and, in some cases, international markets. Community mobilization, capacity building, and seed investments can help overcome the transaction costs of intermediaries or other opportunistic groups that take advantage of distorted or asymmetrical market conditions. This is supported by developing and cultivating market supply-chains that place greater emphasis on community production, social and environmental responsibility or fair-trade demands that arise in new markets.

To achieve collective action, incentives should typically only be provided to those who contribute to the collective action. If anyone can access the incentives without a certain level of commitment, groups have the risk of attracting free riders who gain from the collective action but do not contribute.[99] Incentives can be material and/or non-material.

Material Incentives: Shifting material incentives involves increasing or decreasing the costs, time, or effort of doing a behavior. Methods include enforcing penalties for non-compliance with rules, providing rewards for positive behavior, or making a target behavior easier, such as removing time friction or promoting substitute actions. Examples include group payments where payment is only given if all members comply, rescinding payments for non-compliance, or using a lottery system that determines entries based on compliance. The challenge for this type of incentive is that by expecting a material reward, people may lose their own motivation to change their behavior, offsetting any progress, especially if the reward is taken away. For example, while farmers might have previously conserved land to protect the environment or to help others, payment for conservation practices can lead to seeing conservation through a purely monetary framing. This shift in framing means that, after a monetary scheme is withdrawn, farmers may conserve even less than they did before the action was put in place.

Non-Material Incentives: Genuine cooperation thrives on incentives that are non-material in nature, or what are called psychosocial needs (i.e., beliefs, feelings and perceptions).[100] These non-material motivations include a good reputation, trust, and reciprocity, and can be used over small cash incentives, such as symbolic rewards or public recognition. Non-material benefits connected to a behavior, whether sustainable or not, generally influence behavior in ways that are deeper and longer lasting than material benefits, for example through peer pressure and social expectations/norms. Examples include being elevated to a trainer for peers learning new behaviors; sharing the success of new behaviors with peers during field visits; and providing recognition for a shift in behaviors (e.g., the government of Philippines receiving recognition for a well-managed marine protected area).

Effective Behaviorally-informed Incentives

To be effective, collective action efforts can combine material and non-material incentives using a behavior-centered approach. Examples include:

- Non-financial incentives over small cash incentives, such as symbolic rewards or public recognition (e.g., a plaque, certificate, eco-label).
- Group incentives where payment is made to all members of a group if all of them comply, or they collectively meet a goal.
- Lotteries and prize draws rather than fixed incentives.
- Harness loss aversion by rescinding a payment for non-compliance rather than giving a payment for compliance.

Strengthening Factors

Several barriers can get in the way of this condition, including:

- Lack of perceived value add.
- Existing conflicts.
- Power asymmetries that create a risk of powerful actors not participating to not lose power (e.g., a member leaves the effort after receiving the last benefit).
- Regression occurs when members return to prior behavior(s) after the incentive is removed. Longer engagements lead to the risk of losing potential gains from future transactions (markets, capacity-building, technology facilitation).

The strengthening factors below can help overcome these barriers. System changes necessary include incorporating material and non-material incentives into policies, regulations, and fiscal structures; and planning for the behavior to shift to self-sustaining (e.g., regenerative farm reaches equilibrium and no longer requires incentives).

Members have incentives, motivations, and pressures to join such as a history of cooperation or conflict, external pressures and unbalanced power dynamics, and a lack of other opportunities for accomplishing goals.

Political Reputation and Incentives

Local leaders' political and career incentives may affect their willingness to enter into cooperative arrangements and the degree to which they engage in collective action. For local government, repetition and reputation are often strong enough incentives to maintain participation and commitment and create a cooperative norm, especially in metropolitan areas where many types of governments interact. Repeated interactions in informal and formal networks among local governments reduce the transaction cost of investments in reputation, making cooperation easier. A large network of connected actors adds greatly to the incentives to maintain trustworthiness because of the costly investments necessary to rebuild them while also reducing enforcement costs and improving social capital through monitoring, facilitating mutual reciprocity, trust, and conformance to the rules.[101]

Asset Ownership can Serve as Collateral for Obtaining Credit

Influential individuals often gain a disproportionate share of funds available because they have better collaterals to offer, greater trustworthiness, stronger connections with leading persons in credit-giving agencies or better information about available credit opportunities. Microfinance programs have shown that action through groups can also provide access to credit, with social bonds providing collateral and balancing inequities. Access to credit provides a powerful incentive, particularly for marginalized groups to support rights to property and tenure security. These benefits function as a buffer against risk, and can result in poverty reduction, allowing the less advantaged to help themselves by growing food, investing in more productive activities, or using property as collateral for credit. In this way collective action through microfinance can provide mutual insurance.[103]

Ongoing commitment to and shared ownership of the process. Incentives to continue engaging are present, such as external pressures, known value-add of membership, mutually reinforcing activities, relative power symmetry/ balance,[102] and actors feel like they have the ability to change and control their actions.

Financial incentives need to be proportioned correctly to avoid negative impacts, such as driving lack of trust between partners. Free riding in larger groups can be minimized through selective incentives that reward the protecting a public good, including by excluding free riders from accessing certain group benefits or by imposing sanctions on them.

Government investment via policy and legislation to support incentives, such as supportive local and national tax and regulatory regimes. Rare's Climate Culture program and Entertainment Lab are working with the California Film Commission to advocate for state tax incentives for productions/studios that put climate positive behaviors on screen.[104] Often taxes and regulations are created with larger producers in mind, creating a bias against smaller, local producers (e.g., small-scale forest products businesses); a balancing is needed to achieve equitable access. Government incentives can also be used to fund of CSOs that can serve as a bridge between large amounts of development financing (e.g., climate funds) and local communities while also decolonizing financing through inclusive and equitable practices (e.g., the U.S. Government's Justice40 initiative allocates funds to fund intermediaries to advance local environmental justice initiatives).

Reducing Plastic Bag Use with Government Taxes

Every year, the world uses between 500 billion and 1.5 trillion disposable plastic bags.[105] Regulations, levies, and taxes have become increasingly prevalent, with a focus on banning 'single-use' plastic bag usage. Taxes have been the most effective tool. At least 127 countries have some sort of regulations on plastic bags of varying restriction levels.[106] Those who increased their support for plastic bag taxes also increased their support for other similar policies to reduce plastic waste. High-income countries have used plastic bag taxes due to public pressure and growing green norms. Low-income countries have instead relied on government-enacted plastic bag bans driven by the direct harm of excessive plastic use.[107]

Incentives are relevant for actors' needs and interests, beyond the project goals and are matched to the motivations of the members. Often these can be non-financial incentives that reduce the risk of motivational crowding that happens when monetary incentives overshadow people's own motivations to change behavior. A second consideration when working with communities is to align community goals focused on well-being and income with broader conservation goals.

Financial Empowerment through Savings Clubs

Financial inclusion for small- scale fisheries can support willing communities with financial behavior change and align fishing households' finances with conservation and community development planning horizons. Rare's social marketing and behavior change methodology, coupled with activities for building financial literacy, can help accelerate fishers' transitions from the informal to the formal economy. As individuals save money and build financial identity, they can invest in their families, homes, education, and businesses while also building social trust (a shift in their beliefs about self-efficacy). For example, Rare has helped fishing communities form and launch savings clubs — low-cost mechanisms that help to change financial behaviors within fisher households and expand fishers' planning horizons.

Partnerships are created with the private sector to leverage capital to support both cash and in-kind incentives. External sources of finance from development agencies, government programs, NGOs, microfinance, or commercial banks allow local initiatives to cover their start-up costs and invest in good ecosystem management before their activities begin to generate revenue.

Meloy Fund for Sustainable Community Fisheries

Private foundations can prioritize gaps in public funding that are usually more restrictive in their types of funded activities and can also support expanding models of best practices. The Meloy Fund incentivizes developing and adopting sustainable fisheries by making debt and equity investments in fishing-related enterprises that support coastal fisheries recovery in Indonesia and the Philippines. They also build capacity for value chain improvement and ways to improve fisher access to both private investment capital and public infrastructure investment (e.g., strengthening enforcement capacity for managed access).

Effective advertisement or public communication around available incentives and tracking tools to see adoption of incentives and opportunity for greater leverage/adoption (e.g., site visits to successful projects).

Substitution as an Incentive to Reduce Deforestation

Behaviorally-informed approaches can support traditional payments for ecosystem services strategies and get forest conservation to 'stick.' Other than direct payments, a successful approach to reducing deforestation is to incentivize sustainable behaviors by providing resources that directly address deforestation's causes. The Health in Harmony initiative in Indonesia provides individuals with healthcare and training in organic farming practices; in exchange, participants hand in their logging equipment. Rare adopted a similar approach in the Gansu Province of China, using a social marketing campaign to promote the use of fuel-efficient stoves to reduce deforestation in the area and improve respiratory health. Since most of the illegal logging in the area was tied to the low efficiency of firewood stoves, the campaign promoted the use of newer, more efficient stoves rather than simply providing cash to delay forest harvest.[108]

CONDITION 7:

Inclusive and Culturally Relevant Processes are Built and Maintained in Every Step

A commitment to social processes driven by perception of injustice and identity; alignment with traditional knowledge; collective efficacy beliefs; desire and motivation leading to shared emotions; and putting participation, inclusion, and the pursuit of equity, rights, and empowerment above environmental and economic benefits.

Overview

The most vulnerable and marginalized groups often lack access to resources and find participation in collective action too costly because of lack of time and resources. For many local groups, past attempts to take collective action proved dangerous, as speaking up may have led to punishment, exclusion, and/or shame. Marginalized users' levels of wealth may be so low that participating in collective action violates their survival constraint. This constraint artificially reduces their time horizon since they are forced to attach considerable importance to their present incomes. As a result, they are not willing to undertake conservation investments or endure present sacrifices through self-restraint in using resources even though such actions would increase their future permanent income.[109] Alternately, other resource users enjoy better access to the collective resources because they possess a relatively large number of factors required to exploit it (capital equipment, control over labor power, better skills and knowledge, etc.). This advantage may originate in past accumulation of wealth, greater network of social relations, better education, or privileged access to markets where critical inputs such as credit and a diverse workforce are possible. Equitable collective action processes will need to balance these two.

Collective action requires a considerable commitment to social processes, such as participation, inclusion, and the pursuit of equity, rights and empowerment. Collaborative, inclusive, and participatory processes can create legitimacy and credibility. By being inclusive, collective action efforts benefit from improved conflict resolution and peace-building, community and personal empowerment, political and legal empowerment (e.g., land tenure security, devolution of resource management authority, new regulatory authority, and policy influence), and accumulated social capital to draw from in tackling other collective problems.[110] Diverse experiences and engagement strategies have positive net benefits for cooperation, learning, and problem solving among social groups.[111]

Collectivist Societies Support Collective Action

Individualism (vs. collectivism) is characterized by the view of an independent self (vs. interdependent self for collectivism).[112] Collectivist values are a stronger predictor of responses to collective threats such as climate change and contagious diseases than individualistic-values orientation.[113] People with individualistic characteristics tend to place personal goals and own thoughts and feelings over group goals,[114] view oneself as separate from nature except for how degradation affects them,[115] and are less likely to control their own desire in lieu of collective benefits that sacrifice personal convenience (e.g., paying an additional cost for environmentally friendly products).[116]

People with collective characteristics tend to care about group norms and feelings, collective harmony and conformity, put personal goals after group goals and are more likely to exhibit self-control and sacrifice self-gain for the group's good.[117] As a result they tend to care about environmental degradation because they believe humans are a part of nature and are more likely to engage in a variety of pro-environmental behavior like green purchasing.[118] Collectivistic people tend to make decisions that reflect deference to authority and they experience greater guilt if they behave in a way that violates the expectations of authorities. [119]

Strengthening Factors

Several barriers can get in the way of this condition including bias, differences in identities and socioeconomic status, power dynamics, lack of reciprocity, perceptions of procedural injustice, and the pitfalls of guilt-based messaging. [120]

The strengthening factors below can help overcome these barriers. Systemic changes that can be seen as successful outcomes from achieving this condition include credibility between groups, higher sense of capabilities, and use of and respect for traditional resource management and governance systems.

Co-Creating or building an initiative with diverse actors from the very start creates a unique collaboration space characterized by shared ownership and decision-making, which often leads to access to broader resources.[121] Co-creation cuts across organizational siloing, brings new perspectives early on leading to solutions with greater potential for innovation, and helps with rapid prototyping since diversity is already centered in the process.

Mobilizing the community to participate in conservation, utilizing local knowledge about the resource for planning, and a feeling of belonging by the community to the environment supports this condition. This could include workforce development such as Rare's Climate Culture program's SHINE Community Solar initiative that has a job training partner who's already steeped in the culture and needs of trainees.

Understanding cultural norms, rules, taboos and related behavioral levers, bias, desire, and motivation that are customized to the community of interest.

How our Bias Gets in the Way of Collective Action

Cognitive biases can get in the way of collective action through a few mechanisms: present bias, loss aversion, risk aversion, confirmation bias and availability heuristic.[122] Often these overlap with biases that produce inequities amongst group members. The positionality wheel and Paseo protocol tools at behavior.rare.org are helpful for reflecting on someone's bias.

Confirmation bias is a tendency to focus on, emphasize and recall information that confirms our prior convictions, and to downplay or ignore that which goes against them. This is a bias that often leads to inequities if established norms favor one demographic over the other. It includes unconscious bias.

Availability heuristic is when our judgment of probability or likelihood is based on the availability of examples (or the ease of recall of similar cases) rather than on statistical knowledge. More observable, high profile, or memorable occurrences (such as shark attacks) are therefore considered more likely than comparable events (such as death by falling out of bed). When considering inclusion, this bias can unwind collective action if stakeholders have negative prior lived experiences with others in the community that affect how they participate.

Active involvement of a range of diverse actors and perspectives but with the ability to manage conflicting interests.[123] Early and frequent engagement with end users of natural resources should be included to assess success of past engagements and whether injustices are present or were resolved and acknowledged. [124]

Breaking Down the Gender Divide: Women in Fisheries

Like other sectors, the small-scale fisheries sector is not gender neutral or immune to gender inequality. Women make up an estimated 47% of workers (56 million women) in the sector and contribute to around half of the annual coastal fisheries catch in the Pacific.[125] In the Pacific, men are often on fishing vessels or in technical roles and management. Women are often on processing lines or in administrative jobs, marketing, and sales. Despite women's substantial involvement and critical roles in transferring intergenerational knowledge, their contributions are often overlooked, undervalued and under-reported.[126] An inability to participate in community decision-making and underrepresentation in coastal fishery activities increases poverty among women and worsens associated vulnerabilities such as unemployment, limits to ownership, domestic violence, and food insecurity.[127] Cultural traditions, stories, and taboos can place men and women in different roles, and often restrict women to creeks, rivers, and lagoons versus access to the ocean for fishing. Many gender-inclusive strategies or approaches in small-scale fisheries reach women but are not designed to benefit, empower or transform their lives.[128]

Rare implemented gender-inclusive financial strategies in four districts and 23 villages in Indonesia's Southeast Sulawesi province.[129] These included financial literacy training, establishing savings clubs, and setting up an emergency fund to support agreed upon collective community activities and emergency assistance for households in need. This initiative overcame two common shortcomings in gender focused programs: engaging men in the conversation and empowering women in current and future decisions. By working together, this built a joint knowledge of the savings behavior and financial tools.

Strategies that have been effective for balancing the gender disparity include inclusion of men, so they don't later block efforts by women; empowering women across all aspects of society; valuing women's cultural resources (e.g., traditional fishing grounds); supporting financial literacy and business development; formalizing career pathways; and enabling inclusive platforms for management. A number of tools are available to assess and balance gender inequities from Align Platform, UNICEF, and The Nature Conservancy.[130]

Participation is stable over time, with little turnover.[131] Participation in the group's decision-making process is vital for "ownership" of the actions the group decides to take. When organizations and/or individuals leave a collective action effort permanently or temporarily they signal the work is not important, and this signaling can create tension and potentially result in others leaving.

Achieving Procedural Justice

Procedural justice is concerned with the fairness of how decisions are made and by whom. Perceptions of procedural justice influence emotions and attitudes, with important implications for subjective well-being and people's behavior, especially in group settings.[132] A lack of procedural justice has been linked to anti-environmental behavior and frustration and dissatisfaction with participatory processes.[133] Promoting procedural justice can contribute to decolonizing conservation practice by fostering knowledge co-production.[134] To achieve procedural justice requires transparency, accountability, neutrality, correctability, ethicality, and trustworthiness.

- Transparency: decision-making process is visible, reasoning is communicated clearly, and goals and expectations are clear and agreed upon by participants.
- Accountability: holding responsibility for the decisions made and being answerable to the people affected by those decisions.[135] Mechanisms to promote accountability include elections, information provision, third-party monitoring, and sanctioning.[136] Poor accountability can impede decentralization processes and lead to inequitable distribution of benefits.[137]
- Neutrality: decision-making process perceived as lacking bias, involving accurate use of information, honesty, and consistency in treatment across time and people and can reduce prejudice.[138]
- Correctability: ability to modify or reverse decisions and the ability to appeal a decision, especially critical where corruption exists.[139]
- Ethicality: decision-making process conforms with participants' moral standards.
- Trustworthiness: decision-makers are perceived as benevolent, caring, and fair.[140]

Procedural Justice Best Practices for Policymakers/ Decision-makers

- Understand contextual fit: identify the social subgroups and relevant justice concerns.[141]
- Apply scalar fit: by considering the community's operating time frame (e.g., seven generations for Indigenous communities) and the area of influence beyond the boundary.[142]
- Prioritize conflict resolution mechanisms since stakeholders' satisfaction with conflict resolution mechanisms is strongly associated with the measures of recognition and transparency in decision-making.[143]
- Include skilled, unbiased, open-minded, approachable, and trusted facilitators to reduce misrecognition, promote equitable representation, mediate power imbalances, and support capabilities.[144]
- Ensure Free Prior and Informed Consent (FPIC) recognizes Indigenous people's right to self-determination.[145]
- Integrate knowledge systems to enhance recognition, agency, and respect.[146]

Bridging, bonding, and linking social capital are part of the process that when combined connects those with shared experiences to those with very different lived experiences. Bonding social capital includes social cohesion within groups arising from relationships among people of similar ethnicity, social status, shared values, or location.[147] Bridging social capital can be described as the structural relationships and networks which connect social groups and organizations through collaboration, coordination, social support, or information sharing.[148] Linking social capital incorporates the crossing of statuses connecting, for example, those in poverty to those in positions of influence.[149]

Identity and perception of justice are considered[150] since marginalized groups often become involved in collective action if they feel that the current situation (i.e., status quo) is unfair or deprives them of access, and that they can change the situation (known as Relative Deprivation Theory).[151] A part of identity is recognition, such as acknowledging and respecting sociocultural diversity, including values, cultures, types of knowledge, institutions, power, capacities, and rights — and that people are not defined by a boundary that was set by others.[152] Another part of recognition is high-quality interpersonal treatment, respect and politeness, which leads to feelings of self-worth and a sense of belongingness and can serve as a motivation to cooperate in group settings.[153]

Community, political, legal, and personal empowerment is prioritized including perception of instrumental social support and perceived resources that include psychological, social, and political assets.

Power and agency are available for all members to feel comfortable and safe sharing their interests and needs with the ability to influence decisions, which may require assessing and rebalancing power inequities. Agency provides relational benefits, such as self-validation, emotional support, and a sense of belonging, which also promotes procedural justice.[154] Power analysis can be used to assess inequities in process and governance.[155]

Fusion of modern and traditional knowledge, institutions, management approaches and governance systems occur by formalizing local traditions.

Alignment with Traditional Knowledge

There is strength in fusing modern and traditional knowledge, institutions, management approaches and governance systems. Manifestations of fusing modern and traditional knowledge take many forms[156]:

- Reintroduction of traditional resource management and governance systems, with modern enforcement backstopping.
- Development of value-added processing and marketing, using traditional resources and modern processing techniques and marketing methods.
- Establishment of seed banks that allow the reintroduction of heritage seed varieties, which can improve local adaptive capacity and food security.
- Development of new markets for medicinal plants, which utilize local knowledge of medicinals and plant derivatives to meet the modern demand for natural health products.

Condition 8:
Rules for Resource Use are Contextualized to Local Needs and Capacity

Rules are tailored to the local context, and the benefits individuals derive from the resource are proportional to or outweigh the costs.

Overview

Rules set the stage for the changes needed for the collective action shift to occur. Types of rules include informal rules (e.g., taboos, customs, traditions, and codes of conduct), and formal rules (e.g., sanctions, constitutions, laws, property rights).

- **Operational rules** govern day-to-day actions such as access to the resource, defining the boundaries, appropriation (withdrawing) of the resource, and provision, or what each person or group needs to supply in terms of labor, cash, or materials to invest in the resource, and monitoring requirements. Monitoring and sanctioning/scope rules are particularly important in the sustainability of groups and sustainability of the resource. Graduated sanctions, beginning with mild correction for minor first offenses, increasing to serious penalties for repeated or more egregious offenses, support long-enduring collective action efforts.[157]

- **Collective choice rules** specify how operational rules can be set or changed, who is eligible to participate, and how the decisions are to be made. They include considerations on the process for rulemaking (e.g., consensus or majority rule), accountability for rule breaking, and rules for dealing with disputes.

- **Constitutional rules determine** how collective choice rules are made, including how rule makers are accountable to users. Where users are authorized to make decisions about their own resources, and to change the rules over time, they are more likely to develop rules that are considered fair and fit local circumstances, which is especially important when conditions vary over space and time (e.g., greenhouse gas emissions and climate mitigation tools).[158]

Many of the formal rules above can be applied to a community or family setting, which often influences who in a community can participate in rulemaking. For instance much of the literature on decision-making within the household focuses on identifying factors that give women voice in the decisions, such as who is a member, what are their roles, what

choices can they make, and how they interact with the world outside their home or community.[159]

The formal (external) and informal (internal) rules often interplay with each other, making both important for collective action. For example, in much of Africa, there are various forms of recognition and formalization of relationships, including cohabitation and customary, civil and religious marriage, each with different institutions that reinforce the union or penalize those who split up and legal rules that vary by marriage type. As in the case of natural resource management, recognition also affects the rights that members of a household have over household property and access to pensions, health insurance, and other programs.[160]

Strengthening Factors

Several barriers can get in the way of this condition, including rigid and heterogenous rules that allow for power imbalances[161] and a single entity that measures compliance. The strengthening factors below can help overcome these barriers. Systems changes that support this condition include easily accessible data used in decision-making; local management structures; measured and meaningful change in behavior; and formal governance frameworks that are aligned.

Resource rights or tenure offer local people the rationale for investing in local ecosystem management, including the right to organize. Organizational rights provide local organizations the legal space to organize and engage in joint activities, be they social, commercial, or political. Existing use (e.g., by local peoples) needs to be recognized and taken into account when creating new rules and management regimes. For Climate Culture's Entertainment Lab, access and relationship (to casts and talent) is a key resource that is carefully maintained by partners as well as brand reputation.

In-country policies grant prioritized access and devolve authority to communities and their corresponding participation and management units, including internal rules and methods for tracking compliance with rules. Formal governance frameworks at local, regional and national levels include customary law and tenure, legalizing them with appropriate legislation. For example, for small-scale fisheries, activities include agreements on no-take zones, using the right gear, being registered and licensed, and participating in meetings.

Social learning through respectful information sharing promotes widely acceptable solutions and rule convergence,[162] such as new practices and social norms that build environmental stewardship. This includes adequate formative or background research and/or tapping into institutional knowledge.

Improving Water Conservation: Social Norms and Comparisons

A number of successful collective action initiatives have led to significant water savings. To reduce the quantity of water used in washing towels at hotels, hotel guests were provided with either a reminder that reusing one's towel was beneficial for the environment, or with a descriptive norm message advising guests that most of their peers reuse their towels. Using a norm message of what others were doing was more effective than a standard environmental message at reducing towel use by 9%. This effect was even stronger if the descriptive norm related directly to a guest's specific hotel room, by almost 12%.[163]

Agreed-upon scope, roles, decision processes, and time and resource commitments of the engagement, with set expectations on where changes and flexibility are possible and the consequences of violations.[164] An example from fisheries includes embedding managed access principles into existing area-based management systems.

Preventing Boomerangs to Old Habits in Water Use Technology

Social norm strategies are cost-effective, realistic, easily achievable, and durable and can lead to substantial reductions in water demand.[165] With the ever-growing number of 'smart' technologies being incorporated into agriculture, social norms can also easily be used to change producer behaviors all over the world.[166] However, normative comparisons for water management interventions can lead to 'boomerang effects': high water users use less water, but low-water users use more water. This boomerang effect can be eliminated by pairing the descriptive norm with an injunctive message that informs water users about what others think of their actions and expect them to do.[167]

Data for adaptive management is available and accessible to local participation and management units that facilitates community and data-based decision-making. For example, gathering data for better decision-making by tracking fish catch through a digital app that traders use as part of their business.

Observable Decision Aids Help Build Efficacy

Decision aids are cheap and efficient tools that are easily observable and distributed and simplify choices for decision-makers.[168] For example, in the Bahamas, Rare ran a behavior change campaign from 2009 to 2010, where they also provided fishers with a tool to easily measure the tail size of spiny lobsters.[169] The goal was to prevent fishers from harvesting immature lobsters and allow the spiny lobster population to grow. After the 'Size Matters' campaign was put in place, one of the biggest processors in the Bahamas recorded close to zero undersized lobster for the first time in over 40 years. Another example is using anti-junk mail stickers to reduce overuse of paper. Making existing anti-junk mail stickers more visually obvious made those neighbors more likely to place the anti-junk stickers on their mailboxes; and adding a normative message for people to "engage in environmental protection and attach the accompanying anti-ads sticker to their mailbox" further boosted the positive effect.[170]

Integrating Traditional and Modern Rules for Water Supply in Bali

If local cultural norms are not accounted for, water systems can fail. In Bali, rice farmers have maintained a coordinated and sustainable water usage strategy for centuries without external or centralized enforcement, despite the threat of water scarcity, pests, and disease. Historically producers had developed a unique system involving terracing, irrigation technology, and religious shrines and temples that serve as meeting places to coordinate farming strategies within the community. The system of Balinese water temples acted as communication hubs, facilitating coordination among farmers that made them more resilient to pests and water scarcity issues. Where the temple system has been abandoned, water scarcity and pest problems are rife.[171] Formalizing local management traditions is one way for policymakers to reinforce existing social norms while maintaining the capacity for regulation to adapt to changes in water availability.[172]

Social Norms can Become Self-Enforcing

Social influences are the most common behavior lever applied to biodiversity conservation interventions. Social norms describe how an individual's actions are influenced by their beliefs of what others are doing, and what others think they should be doing.[173] A tendency to conform to social norms is deeply rooted in humans' unique evolutionary history around social emotions such as pride, admiration, envy, and shame.[174] Social norms can become self-enforcing once a community expects a given set of behaviors. This is unlike rules and regulations, which require formal and dedicated enforcement.[175]

Norms are often shared across identities such as gender, race, ethnicity, socio-economic status, and various culturally specific positions of power through prestige and authority. We tend to adopt the norms and values of our 'in-group' through a process of self-expression and belonging. Conversely, we may intentionally distance ourselves from, and shun the practices of, our perceived 'out-group.' Because of this understanding group norms can help with scaling and set up a tipping point, where changes among a minority can result in rapid group-wide changes in beliefs or behavior, necessary to result in collective action.[176]

Interventions focusing on shifting norms tend to move through three behavioral science-informed phases: generating collective demand, coordinating a shift in behavior, and strengthening that norm.[177] Examples of where social norms have shifted at the community scale due to behavioral interventions include encouraging the adoption of toilets, reducing female genital cutting, or encouraging treatment adherence to painful drug regimens like those used to treat tuberculosis.[178]

CONDITION 9:

Management of Rules and Enforcement Centers Local Stakeholders' Input

The target group has the opportunity to advise and make decisions on the rules, monitoring and enforcement, and revisions through formal and informal structures.

Overview

Collective action will likely be ineffective without enforcing rules against those who would extract excess benefits illegally, in excess of due allocation, and/or beyond the capacity of the resource system to supply. Community leaders and institutions can motivate collective action and promote sustainable natural resource management through improved coordination, enforcement, compliance, and conflict resolution.[179] However, this group may also bear the costs of enforcing the rules.

Strengthening Conditions

Several barriers can get in the way of this condition, including:

- Legislation that can limit the scope of authority of community-based groups;
- Failure to transfer rights from governments to communities to manage or enforce; and
- Potential conflicts between community members if not equipped with appropriate skills to mediate/ manage conflict.

The strengthening factors below can help overcome these barriers. Systems or processes designed and built with stakeholders or enforcing partners in mind are critical to supporting this condition.

Power Dynamics and Rule Enforcement — A Double-Edged Sword

In collective action efforts it is often the most resource-rich member that bears the cost of implementation. While this can accelerate collective action, it can also create negative feedback for less resource-rich members. Examples of resource-rich members driving collective action include large landowners initiating the Pithuwa irrigation system in Nepal because their lands are located near the tail of the system.[180] In Mexico, the Indian caciques (rich Indians acting as patrons) assume leadership for managing common lands.[181] And in Imperial China, dominant lineages select the forest manager and set and enforce rules for access and use.[182]

A **negative example** is from Mali where absentee herd owners with outside economic opportunities created a major stumbling block on the way toward pastoral institution-building for sustainable rangeland management. This was a result of the great Sahelian droughts in the 1970s when pastoralists were forced to sell their livestock to wealthier town-dwellers such as traders and civil servants. Absentee herd owners favor open access rangelands so that their herds can graze anywhere. They may even use their political influence to prevent pastoral associations receiving legally defensible land rights.[183]

A **positive example** is from Japan, where visible deforestation made villagers aware of the risks of overuse and enabled them to develop and enforce stricter rules for conservation on their own to save their forests and commons from the same fate. Local management sought fairness by using a lottery system to grant access to parcels, requiring frequent rotations of use, and scrupulous attention to bookkeeping to keep track of contributions and exchanges. A household had to earn its eligibility through some period of established residence in the village, and casual drifters were ignored.[184] When uniform quotas are used in strongly inegalitarian agrarian societies, the economic elite typically behave as patrons towards marginalized people. Equal treatment of the marginalized is then part of an informal insurance mechanism whereby wealthy people socially protect their clients in return for benefits in other sectors of social life.[185]

Effective management bodies and devolution programs that transfer management responsibility such as building on existing commitments and implementing co-management. Rights over the resource are needed to provide groups with the incentives to conserve and even invest in the resources and the ability to stop members or outsiders from breaking the rules.[186] New Zealand passed legislation establishing community-based natural resource management frameworks that allow the community to co-develop a resource management plan with government agencies. This model often leads to both more effective management and more equitable development goals for local communities.

Locally Designed Controls Prevent the Tragedy of the Commons in a Small-scale Fishing Community in Mexico

Access controls play a central role in a group's ability to manage its common pool resources.[187] The Seri Community in the Gulf of California of northwest Mexico were granted full rights by the Mexican government to manage a mollusk fishery of sea pen shells, a delicacy that brings high prices in international markets. Scope rules specify harvesting locations and maximum allowable catch to the commercial fishing fleet. The Seri monitor the health of fish in prohibited sites (and thus potential illegal activity) through annual assessments of the fisheries by non-fishing members of the Seri community. The discovery of smaller size classes or fewer sea pens triggers punishments including verbal shaming of Seri fishers who helped break any rule, and loss of equipment and expulsion for violators from commercial fisheries. Without scope rules, Seri crew members would likely find few incentives to regulate outsiders' fishing effort, and overfishing would eventually take place as fishing pressure increased. The Seri have been able to sustain relatively constant rates of fishing effort over time, while other open access and ecologically similar fishing areas (outside Seri control) have not been able to do the same. [188]

Simplify messages and decisions that are more actionable than complex ones. Simple messages can break through information overload and the number of decisions we all make on a daily basis. Decision aids like rules of thumb, checklists, and mnemonics are various strategies to help us deal with this complexity, making it easier to make good decisions.[189] Examples include messages such as: "reduce, reuse, recycle" for waste reduction and diversion and "Slow the flow, save H2O" for water conservation.

Increased behavioral observability and accountability. Observability is not just about curbing undesired behaviors (e.g., photo captures for toll violations), but also about promoting good behaviors. Easily visible positive behavior allows us to signal values and receive praise and recognition, which we can amplify by making the behavior more noticeable by others or by increasing the level of social reward (e.g., through greater public recognition).

People can easily share feedback and ideas so that the enforcement strategies can be adaptive to the needs of the community. This is especially important at the early stages of collective action and depends on how well outcomes are monitored (See Monitoring Section).

Making it Visible and Easy with Recycling Bins

In Peru, no matter how recycling was framed, residents did not want to keep recyclables in their house because of the space it took and the fear that it would attract pests. Also, the separation of recyclables from general waste was generally associated with unofficial workers that residents stigmatized as 'scavengers.' For these reasons, simply providing residents with recycling bins was much more effective than any kind of messaging, be it information on environmental or social benefits, social comparisons, social sanctions, rule and regulation concerns, and reminders. This intervention made recycling more materially convenient, reducing the time and effort required to perform the target behavior.[190]

Locally led Forest Management Accelerates Regeneration

Forest commons are common spaces used by many diverse users, yet the boundaries of the resource, the identity of the user group, and property rights to benefits from the resource are usually well defined. The International Forestry Resources and Institutions Research Program looked at 152 cases from 9 countries of local enforcement of forest management practices including size of forests, collective action around forests (with a focus on improvement activities), user group size, and dependence on forests. Higher levels of local enforcement were strongly associated with increases in forest regeneration and decrease in likelihood of degradation. Yet, for local enforcement, larger forest areas are more difficult to monitor and are likely to experience more degradation than smaller forests. Similarly, when local enforcement is robust, even commercial forests and those used for firewood by communities benefit with regeneration yet degrade when enforcement is low.[191] While local enforcement is effective, networks of enforcers can be supportive in large areas.

A Community-based Co-management Model for Small-Scale Fisheries

Fish Forever staff, together with the local government and community, agree on a set of rules that fishing households will follow in exchange for being allowed to fish. These usually include agreements around staying out of no-take zones, using the right gear, being registered and licensed, and participating in meetings. The implementation team also helps form a management body that makes sure plans are executed fairly and effectively. Once these rules are formalized, the implementation team and the local government work together to make sure everyone is aware of them and they are enforced. They also establish ways to make sure the behaviors are observable and create ways by which fishers can show others they are doing the right thing. Local officials are asked to make public displays of commitment, and the rest of the community is also pulled in through festivals, school visits and other celebrations. This signals to the fishers that everyone is behind this shift towards more sustainable fishing. Eventually, this becomes the new norm, and the community becomes self-enforcing. [192]

CONDITION 10:

Monitoring of Resource Use Occurs

Monitoring of resource use occurs and those that monitor it are held accountable by resource users (including enforcement, accountability from the community, visibility, and external support).

Overview

Natural resources are more likely to be conserved when resource users have acted collectively to organize monitoring and enforcement activities.[193] If we don't monitor progress towards collective action we can't know if it's working. Monitoring includes observations, tracking, and recording (often publicly) the progress and compliance towards desired outcomes. Benefits of monitoring include ensuring rules are followed, while at the same time establishing new norms and allowing communities to adjust as transformation occurs — both of which can be explicitly looked at when developing a monitoring approach. While monitoring regulations often requires long-term commitment to monitoring and enforcement, social influence and a focus on social norms (e.g., public displays of commitment) can lead to self-enforcement.

To be successful, key types of monitoring include: 1) adoption of the desired change by the target audience, 2) visibility of the action(s) or changes from the rules to the target audience, 3) changes in expected outcome of the rules (e.g., ecosystem function, resource protection, quality of life), 4) social indicators, and 5) equity and inclusion.

When Best Intentions Fail

Often with large and complex problems like climate change or trash pollution, a gap exists between people's intentions/values/attitudes and their actions, known as the intention-action gap,[194] which requires a robust monitoring program. The reasons for this gap are perceptions around insufficient knowledge of actions to take and costs or time required to take suggested actions.[195] Strategies used to overcome the intention-action gap include: 1) making choices easier or catering to cognitive bias and leveraging people's status quo bias (i.e., our tendency to stick with current options) such as making the desired behavior a default option or pre-selected behavior,[196] 2) altering the architecture of the choice environment to make the choice consistent with their existing values and intentions, and/or 3) influencing habits by shifting existing habits to encourage reflection on other values or intentions or building new habits where the behavior meets the target goals.

Many programs fail to include behavioral outputs as key indicators and falsely assume that achieving environmental outcomes will naturally lead to positive social outcomes for affected communities, yet often these programs can negatively affect the social welfare of a community. Tools such as Rare's 'Behavior-Centered Design' (BCD) training [197] can support improved understanding of whether behavior change is occurring during monitoring and help in understanding why people are or are not taking the desired actions.

Embedding Social Justice in Monitoring

Attention to justice is increasing in monitoring and evaluation programs,[198] and it is well known that inequities can threaten conservation outcomes.[199] Due to historical injustices, some people may have more rights to resources than others and/or different ownership models exist. Zafra-Calvo recommends 10 indicators of equity to be used for monitoring programs in protected areas:[200]

- Cultural identity: Cultural identities of local stakeholder groups incorporated in the management of the protected area.
- Statutory and customary rights: Local stakeholders groups gain or retain their rights in the establishment or management of the protected area.
- Knowledge diversity: Traditional knowledge systems included in the management of the protected area.
- Effective participation in decision-making: Local stakeholders groups satisfied with how decisions are taken.
- Transparency: Local stakeholders groups accessing information about management and planning.
- Access to justice: Local stakeholders groups resolving satisfactory disputes due to protected area establishment or/and management by existing mechanisms.
- Accountability: Local stakeholders groups know to whom to raise concerns for solving issues related to management actions.
- Free, prior and informed consent (FPIC) is obtained.
- Benefits: Households of local stakeholder groups receiving tangible benefits from management actions in a way that respects culturally accepted distributional principles.
- Burdens: Households of local stakeholder groups relieved of burdens through mitigation actions or comprehensive compensation of them.

For example, Rare has consistently observed that when fishers gain knowledge about sustainable management, realize how they need to modify their behavior and discuss these changes with others, they are primed to adopt new practices that foster fisheries

recovery. Empowering communities to believe that they possess and can use the necessary knowledge, skills, decision-making authority, and resources needed to steward their fisheries, is key to this. To achieve this outcome, an effective outcome and monitoring system must be in place.

Strengthening Conditions

Several barriers can get in the way of this condition including availability of timely and consistent data, shared understanding between community data and government data needs, accountability to the data, time and capacity for data collection, and compliance costs. The strengthening factors below can help overcome these barriers.

Using Technology to Advance Rapid Data Sharing for Small Farmers

Rare's Lands for Life program[202] supports regenerative agriculture by supporting monitoring implementation of farmer practices. The latter occurs by collecting data on conservation practices being implemented (e.g., composting, cover cropping and reducing water use using agroclimatic data for informed decision making) and the outcomes to conservation and soil health so that the information can be shared among other farmers in places like Colombia. Extension agents are able to share data and content provided by Rare in a timely manner through texting, a preferred communication medium, by delivering remote, customized, and timely technical assistance, information, and services to increase their productivity, profitability, and environmental sustainability. Technology overcomes key challenges around timeliness of data, linkages to rules, and data usability by supporting farmers in collecting their own data that supports day-to-day decision-making on soil and water conservation. The data are easily accessible to individuals and can also be shared with neighbors to accelerate collective action in the region — creating a regional network of regenerative agriculture practitioners.

Use of qualitative and quantitative data is encouraged, which can often overcome the dichotomy between community-observed data and government data needs. Community observations and data serve as a "canary in the coalmine" for shifts in the community and storytelling among community members can serve as a key vessel for this. Aligning these types of data with scientific instrumentation can yield monitoring outcomes that are trusted and utilized in decision-making and in peer networks. Often the use of public data is a part of this, though it's important to consider whether community members are comfortable sharing their information (e.g., confidentiality needs for grave sites and medicinal plants).

Participatory monitoring includes collaboratively working with target actors (e.g., the community) to identify indicators of resource conditions that can be easily monitored to indicate

management effectiveness (e.g., invasive species, species indicative of over-grazing or over-harvesting, carbon emissions reductions, etc.). The approach and factors being monitored should be agreed upon with the impacted community and address any imbalances in rights/ownership to resources, given they are an effective agent for monitoring social change.[201] To achieve this implementers should consider including training on monitoring, data recording, and enforcement in their plans for the community.

Constant and iterative evaluation opportunities are included through adaptive management and an open and transparent process.

Monitoring Psychosocial Factors to Reduce Poaching in Thailand

WWF Thailand and Thailand's Department of National Parks ran a community outreach program aimed at reducing poaching in and around the Kuiburi National Park. Program designers identified six psychosocial factors known to influence behavior: trust, public support, motivation, ethics, self-efficacy, and confidence. Based on these findings, they built a program to create the opportunity for the wider community to organize and collectively express that poaching was detrimental to their livelihoods and that they had the power to act against it. By 2011, poaching pressure had dropped by a factor of four across the park, with five of the six focal species increasing in abundance across monitoring sites. Just as importantly, by the conclusion of the intervention, 90.5% of the community supported wildlife recovery. Community members' top reasons for the decline in poaching was park outreach rather than patrolling. Through the collective action of their outreach events, the program created a new norm within the community of poaching being seen negatively, providing a social rather than formal determent.[203]

Changes are observable and the process for achieving change is easily visible, so that others will know when someone is taking the desired collective action step, and that everyone is expected to do the right and sustainable behavior at a community level.

Data are usable and presented in formats, language, and mediums that facilitate its use for decision-making by resource users. For this factor, data should be easy to access, easily observable, and easily shared with key partners (e.g., elected officials), without requiring a data intermediary.

Community-Based Patrols in Rare's Fish Forever Program

To cultivate the belief that people will find out if a fisher takes from the reserve area, fishers are encouraged to organize voluntary sea patrols. While these patrols often lack the legal authority to arrest those who fish in the reserve, they do observe these violations and can report them, both to authorities but even more importantly, to the rest of the community. This leads fishers to believe that if someone were to fish in the reserve, others would likely find out. Often to get over the barrier of knowledge (e.g., not knowing about the boundaries) visual indicators or decision aids such as buoys are placed to show people the boundaries of the rules.

In the Bahamas, for instance, Rare ran a behavior change campaign from 2009 to 2010, where they also provided fishers with a tool to easily measure the tail size of spiny lobsters. The goal was to prevent fishers from harvesting immature lobsters and allow the spiny lobster population to grow. After the 'Size Matters' campaign was put in place, one of the biggest processors in the Bahamas recorded close to zero undersized lobster for the first time in over 40 years.

Data access and equity. To ensure that monitoring efforts are fair and just, and they achieve the desired goals, the data should be credible, authentic, updated, and reliable. Often a critical component of this condition is to develop a science-based network to support third-party independence and reduce bias.

Gender Inclusion in Monitoring

Designing monitoring without inclusion of all demographics in mind often misses critical aspects of a sustainable collection action effort. For instance, women make up an estimated 47% of workers (56 million women) in the small-scale fisheries sector and contribute to around half of the annual coastal fisheries catch in the Pacific — yet they are not often included when developing monitoring programs. In the Cook Islands, gleaning in low tide zones is mainly carried out by women, while men target pelagic species in deeper waters. Often in the process of establishing boundaries, rules, and monitoring programs implementers often leave out the importance of low-tide waters, because women are not often engaged in decision-making around boundaries and monitoring. Being left out of community decision-making and underrepresentation of women in coastal fishery activities increases poverty among women and worsens associated vulnerabilities such as unemployment, domestic violence, and food insecurity. [204] Cultural traditions, stories, and taboos can place men and women in different roles – and often restrict women to creeks, rivers, and lagoons versus access to the ocean for fishing. Approaches for including women in monitoring and resource management include outreach to both men and women (so men do not block later actions), empowering women, and valuing women's traditional fishing grounds.

Reducing Monitoring Costs for Climate Action

For large-scale collective action efforts such as reducing global greenhouse gas emissions, monitoring can become expensive. However, as target actors act in concert and collectively signal that all actions must be low carbon and that their collective action will reward countries embracing this new reality, they might generate shared norms. By showcasing that all are expected to contribute to low carbon actions, the collective costs of monitoring and enforcement are reduced, making free riding less likely to be tolerated. If successful, and as norms become entrenched, it will become increasingly more costly for governments not to move to a low-carbon development pathway.[205] Rare's Climate Culture Index sets and tracks individual behaviors towards climate action by surveying a representative sample of individuals across the country about their opinions, beliefs, and preferences related to each of the seven highest-impact emission-reducing behaviors an individual can adopt to help reduce emissions. The summary data can also provide valuable insights for media and the government, and empower climate activists, advocates, and allies to design data-driven interventions more likely to move people along the journey from inaction to action—and ultimately, start building the critical mass needed to drive large-scale change and shift our climate culture. Rare plans to run the Climate Culture Index annually to collect trends over time.

CONDITION 11:

Nested Governance Facilitates Aligned Decision-making Across Scales and Stakeholders

Nested governance is accessible, so that decisions across scales (e.g., local, regional, national) are aligned across scales for those impacted (e.g., households, communities, governments, corporations, etc.), and membership includes relevant voices such as government and marginalized communities and sectors.

Overview

Some of the most significant predictors of success for locally managed ecosystem protection are national-level variables, including environmental democracy, political stability, and voice and accountability. National and local governments are often the lead players in bringing about enabling conditions for successful ecosystem-based initiatives at the community level. Matching the mismatches with institutional innovation and misalignment across scales of governance is key to improving the conservation and sustainable use of biodiversity.[206] For example, subnational (provincial) engagement and support are essential to scale and bridge local to national and international efforts. Subnational government units provide existing networks of local government leaders to engage in decision-making and resource allocation across larger scales.

Critical areas where governments across all levels can focus on supporting collective action at the local level includes supportive rights frameworks, favorable tax and regulatory systems, and legitimizing and empowering local communities. To be effective for collective action the policies, regulations, and incentives or disincentives need to be consistent and supportive between all levels of governance (e.g., local, subnational, and national government).

Opportunities for governments to expand collective action efforts may require them to adopt a different partner paradigm for government to emphasize the government's supporting role, providing planning, capacity building, assessment, and other support services. These could include:

- Enterprise planning, product research, and market development through rural enterprise programs;
- Capacity development through extension services and business training programs;
- Environmental and economic monitoring and assessment, including the provision of mapping and data services; and
- Taking lessons learned and applying them at the policy level to support scaling up of successful local models.

Rare's Fish Forever program discovered national policies can mitigate challenges and promote solutions to sustainable and effective coastal fisheries management at the local level. They also provide the legal and regulatory framework necessary to implement managed access with reserves, ensuring that communities can secure access to their fisheries resources, devolving fisheries management authority to a local level, and requiring or incentivizing participatory management. Fisheries management is also a political decision, and so by developing the evidence and reasoning for investing in improved management, policy dialogs happen and drive local, national and international commitments and priorities for the sector.

Strengthening Factors

Several barriers can get in the way of this condition, including:

- Lack of supportive governance policies for key stakeholders;
- Pressure from other stakeholders seeking the status quo;
- Limited capacity and budget, weak governance, and/or political instability;
- Loss of institutional knowledge; and
- Unempowered local communities excluded from or opting out of decision-making.

The strengthening factors below can help overcome these barriers. System changes needed to support nested governance include government support through legislation, funding and enforcement; broad-based participation through a general assembly or similar joint decision-making body; and policymakers embrace the new norm which also includes budget allocations, planning documents, and institutional capacity.

"Good governance" in Small-Scale Fisheries Management

At most Fish Forever sites, the gap between existing and required capacity for effective management was sizeable and stemmed from symptoms of weak governance such as: inconsistent, conflicting, obsolete, or poorly communicated policies; lack of leadership, motivation, expertise, skills and funding at management agencies; and unempowered local communities excluded from or opting out of decision-making. Nesting effective fisheries management in a "good governance" system (one that promotes participation, inclusion, equity, accountability, and transparency) became a central component of Fish Forever's operating model.[207]

Membership and government involvement occur across scales guided by the boundaries established and supportive of horizontal (across departments) and vertical (across agencies) linkages. Rare's Climate Culture program is supporting connectivity between federal policies and on the ground implementation to support policy-relevant collective action. The Inflation Reduction Act creates a linkage to regional solar installation, where national policies and funding is leveraged to support local actions. This leveraging tool builds from a combination of local climate action plans and Justice40 implementation, a federal initiative requiring the allocation of 40% of federal dollars to vulnerable communities.

Enable broad based participation through a general assembly or similar joint decision-making body and incorporate accountability mechanisms such as elections.[208]

Reliance on strong individual leadership and establishment of mechanisms for leadership transition. Cultivating and actively supporting committed leaders and 'champions' at national and local levels — and connecting them — provides short and long-term support, inspiration, and continuity. This can include alignment between implementers and policy staff and training for champions to elevate messages to parts of the organization that are not readily accessible.

An example includes Rare funded and trained Local Campaign Managers to support facilitation, engagement, and support sharing best practices across geographies where Rare works. The capacities built in these campaign managers — strategic planning, behavioral interventions, effective communication, skills transference ("train the trainer"), fisher engagement and mobilization, and managed access with reserves design, governance and administration — also served to strengthen their institutions.

Bridging Local and National Policies in Mozambique

When Fish Forever began in Mozambique, they hoped to shift local policy and initially engaged the community and the local government. They later realized they neglected the central government who had the final say in approving MA-R plans. Fish Forever strategically engaged policymakers at all levels of government and identified political champions (i.e., key influencers) who could provide government leadership. Rare staff in Mozambique pivoted to address nested governance by:

- Aligning local-central government policies and conducting a policy evaluation of MA plan and processes, to address gaps.
- Engaging the Ministry of Environment to expose to the same messages as at the local level with site visits, workshops, and seminars.
- Drafting or providing comments on new and/or existing policies and regulations to enable community rights-based management (by invitation).
- Formalizing customary law and marine tenure by incorporating them into governance frameworks at local, regional and national levels, and legalizing them through appropriate legislation.
- Convening, consolidating, synthesizing and delivering stakeholder inputs for government review and consideration.
- Connecting government officials with site-level work through official field visits and learning exchanges.

Fish Forever elevated the importance of coastal fisheries by working bottom up and top down through multiple levels of government. Developing lateral and vertical policy diffusion processes allowed messages to resonate across political contexts, providing a key narrative that effective coastal fisheries management is essential to ensuring food security, rural development, resilient communities and sustainable natural resource protection.

Inclusion of marginalized or under-represented sectors of society.[209] Devolution of some decision-making authority from higher to lower governance levels so that progress isn't slowed by bureaucracy. Convening, consolidating, synthesizing, and delivering stakeholder inputs for government review and consideration can support this.

Tenure security driven by communities and initiatives that demonstrate their effectiveness as land managers (e.g., local government recognition, national policies and legislation, and advocacy through organizing)[210] is especially important for collective action undertaken on larger systems and scales (e.g., regional and national scales). Lands and waters with long histories of governance by Indigenous Peoples and local communities (most often

communal) have been well protected and sustainably managed over time.[211] Indigenous and local community governed lands and waters see less loss of intact forest, more carbon storage potential, and greater provision of essential ecosystem services than government-run protected areas.[212]

Bi-directional Policy and Community-based Fisheries Management

Fish Forever partners and works closely with local, subnational, and national governments to help advance and sustain these coastal nations' vision. The policy work creates an enabling environment that promotes widespread adoption and community-based approaches and small-scale fishers' access to and sustainable use of coastal fisheries. Fish Forever's policy and government engagement work leads to establishing legal pathways for communities to secure access rights and implement managed access and reserves by working with governments to secure priority and preference for coastal communities in their access and sustainable use of resources. The policy work also emphasizes the need to work with local government leaders, being the closest to both the resource and the constituents, in elevating the issues of coastal fisheries and implementing relevant solution.[213] Developing lateral and vertical policy processes allow messages to resonate across political contexts.[214]

CONDITION 12:

Scaling is Technically, Economically, Socially and Culturally Feasible and Desirable

Opportunities exist for scaling benefitting from the other conditions and include quantitative scaling, functional scaling, organizational scaling, and/or political scaling.

Overview

Scaling collective action efforts is largely contingent on the success in achieving the above enabling conditions. Effective scaling can have broad and positive repercussions for ecosystem protection and productivity and for closing the social equity gaps.

Types of scaling include: [215]

- Quantitative scaling, in the form of an increased membership base, geographic spread, and replication of the initiative's organizational model or management methods.
- Functional scaling, which results in an expanded scope or portfolio of activities or benefits.
- Organizational scaling, which brings greater internal capacity, financial independence, and staff development.
- Political scaling, which manifests in greater policy influence and more effective network building.

Beyond simple growth in an organization's membership, quantitative scaling also encompasses the replication of an organization's management methods or organizational model by outside groups. Success is a powerful message that similar groups in other communities are anxious to hear. The demand for a viable route toward resource security, greater income, and a way out of the political marginalization experienced by many communities has meant that successful groups are often sought out as exemplars, mentors, and advisors by many outside groups. This mode of organic scaling is thus personal and well-supported by local demand, which accounts for its effectiveness.

Strengthening Factors

A number of barriers can get in the way of this condition including regression to former behaviors; limited time and capacity; movement away from culturally inclusive practices; lack of data at sites without intervention; and decoupling between local scales and larger ecological and industrial systems (e.g., industrial agriculture).

The strengthening factors below can help overcome these barriers. Systemic changes that can be seen as successful outcomes from this condition include replication of models by outside groups, high-level commitments, unlocking meaningful financing opportunities at greater scales, and improving well-being outcomes beyond the initial goals of the collective action effort. Supportive tools include household surveys and monitoring and evaluation efforts.

Broad adoption of solutions, proof of concept and advanced replicability based on strong data outcomes, and including legislation, governance, capacity building and sustained financial investment. This can include inter-country comparisons to identify which activities are successful in which areas, and what underlying conditions may be affecting progress.

Consistent Training for Scalability: Fish Forever's toolkit

Rare's Fish Forever toolkit allowed for faster onboarding and consistency for local implementers to help scale the program. It included Rare's Pride Curriculum, Fish Forever's curriculum and E-courses, fisheries landscape and goal setting tools, managed access with reserves design strategies, and adaptive fisheries assessment and management plans. Design forums and community workshops included collaborative work to define the goals of managed access areas with reserves and identify priority species and habitats; map the municipal zones relevant to managed access with reserves; determine the designated boundaries of the communities' managed access with reserves; and allocate fishing rights and responsibilities within managed access with reserves.

Concurrently optimize the level of governance and necessary ecological scale at which impact and scale would be greatest. Institutional fit assesses whether a form of collective action at a local level matches the larger ecological system within which it is subsumed. For instance, a community-level institutional arrangement to manage a forest may be surrounded by a concession area for resource exploitation under a different set of

rules and goals, requiring inclusion and integration with these systems.[216] For Fish Forever, identifying the appropriate geographic coverage to scale the managed access area with reserves was important to ensure stakeholder buy-in and participation.

Blended capital supports sufficient financial, operational and political resources. This includes creative financial mechanisms such as ones that blend philanthropy, government appropriation, public finance and private capital to match the need for building proof points and ultimately strengthen the capacities of both government and local communities and reduce risks for private investors.

Ability to influence institutional agendas, aligned to larger policy anchors, and including established laws, public policies, and/or a regulatory body that will continue to manage the problem, with a local anchor to continue to advocate for the solution. Rare's Fish Forever program uses metrics that other partners can easily use and that are aligned to the United Nations' Sustainable Development Goals (SDGs), including contributions towards several SDGs such as 1: No poverty; 2: No hunger; 5: Gender equality; 8: Decent work and economic growth; 12: Responsible consumption and production; 13: Climate Action, 14: Life below water, 16: Peace, Justice, and Strong Institutions, and 17: Partnerships.

Coalition is sought out as exemplars, mentors, and advisors by many outside groups. Success is a powerful message that similar groups in other communities are anxious to hear. However, this requires sufficient resources and capacity.

Recognize and reward innovation as recognition of a group's accomplishments can bring significant ancillary benefits, such as a higher national and international profile, and with this, greater access to important government, business, and funding contacts.

Group cohesion is balanced with technical outcomes and is required to move towards sustainable efforts but takes longer to achieve than typical output-based metrics. Community leaders and institutions can support this by facilitating social learning and the diffusion of innovations within the community and beyond.[217] Cohesion focused metrics can include perceived value of the coalition by members, network density and other measures of network strength, measures of social capital, and trust index scores. Tools to help define and measure cohesion include Social Network Analysis, Perception and Feedback Surveys, and Social Capital Indices.

Completed and implemented sustainability planning, including assessing individual, organizational, financial and activity sustainability. Organizational planning includes assessing the pros/cons of a becoming newly registered legal entity, such as an NGO, CSO, CBO or association; merging into an existing legal entity of one of the types mentioned; becoming a Government or parastatal body, or merging into an existing Government office or institution; or staying informal. Activity planning includes reflecting on the most effective and least effective activities to continue operating. Financial planning includes external funding sources such as fundraising, grant writing or Government support; internal sources such as membership fees, income generating activities, in-kind contributions or leveraged support from coalition members; or some combination of external and internal. Putting these all together will inform sustainability planning.

Horizontal and Vertical Scaling for Rare's Fish Forever Program

Key characteristics that helped Rare's Fish Forever program scale horizontally (e.g., at the local level) and vertically (across geographies) have included:

- New initiatives require sufficient financial, operational and political resources.
- National authorities are partners from the outset for early investment, and national scaling plans are required.
- Sustained investment is in shared services to ensure effective program execution, including training and ongoing learning and design.
- Strategies cushion fishers against crises and shocks, through financial and market inclusion strategies, like the formation of savings clubs.
- Investments in sound and sustained monitoring and evaluation.
- Identification and focus on key themes/behaviors that the organization understands are key to scale, promote these, then everything needs to align.

Endnotes

1. Circle Economy. (2021). The Circularity Gap Report 2021: Solutions for a linear world that consumes over 100 billion tonnes of materials and has warmed by 1-degree. Circle Economy.; Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, IPBES. (2019). Summary for policymakers of the global assessment report on biodiversity and ecosystem services (summary for policymakers).; Zenodo, et al. (2020). Global human-made mass exceeds all living biomass. Nature, 588(7838), 442–444.; Steffen, W., et al. (2015). The trajectory of the Anthropocene: The Great Acceleration. The Anthropocene Review, 2(1), 81–98.

2. Scoones, I., et al. (2020). Transformations to sustainability: Combining structural, systemic and enabling approaches. Current Opinion in Environmental Sustainability, 42, 65–75.; UNEP. (2021). Adaptation gap report 2020. United Nations Publications.

3. Conference Of The Parties To The Convention On Biological Diversity. (2014). Conceptual And Methodological Framework For Evaluating The Contribution Of Collective Action To Biodiversity Conservation - Conference Of The Parties To The Convention On Biological Diversity Twelfth meeting Pyeongchang, Republic of Korea, 6-17 October 2014 Resolution XI/4, paragraph 23; Meinzen-Dick, R., M. Digregorio, and N. Mccarthy. 2004. Methods for studying collective action in rural development. Agricultural Systems 82(3):197-214.; USAID. 2022. Collective Action Practical Guide. https://usaidlearninglab.org/sites/default/files/2022-07/collective_action_practical_guide_for_usaid_missions_july2022.pdf; Agrawal, A., & Ostrom, E. (2001). Collective action, property rights, and decentralization in resource use in India and Nepal. Politics and Society, 485–514.; Bodin, Ö. (2017). Collaborative environmental governance: Achieving collective action in social-ecological systems. In Science. Doi: 10.1126/science.aan1114; Colfer, C. J. P. (2007). Simple Rules for Catalyzing Collective Action in Natural Resource Management Contexts. 19. Retrieved from http://www.cifor. Cgiar.org/Knowledge/Publications/Detail.htm?&pid=2252&pf=1; Olson, M. (1965). The logic of collective action: Public goods and the theory of groups. Cambridge, MA: Harvard University Press.; Mahajan, S. L., et al. (2021). A theory-based framework for understanding the establishment, persistence, and diffusion of community-based conservation. Conservation Science and Practice, 3(1).; May CK. Complex adaptive governance systems: a framework to understand institutions, organizations, and people in socio-ecological systems. Socioecol Pract Res. 2022;4(1):39-54. doi: 10.1007/s42532-021-00101-7.; https://www.researchgate.net/figure/The-complex-adaptive-cycle-Adapted-from-Holling-Gunderson-2002-and-Briggs-et-al_fig1_344047562; Mercy Corps. (2022). The Collective Action Framework.; Folke, C., Carpenter, S. R., Walker, B., Scheffer, M., Chapin, T., & Rockström, J. (2010). Resilience thinking: Integrating resilience, adaptability, and transformability. Ecology and Society, 15(4), 20.; Walker, B., Holling, C. S., Carpenter, S. R., & Kinzig, A. (2004). Resilience, adaptability, and transformability in social-ecological systems. Ecology and Society, 9(2), 5.; Holling, C. (2001). Understanding the complexity of economic, ecological and social systems. Ecosystems, 4, 390–405.; Ostrom, E. (2009). A general framework for analyzing sustainability of social-ecological systems. Science (New York, N.Y.), 325(5939), 419–422.

4. https://usaidlearninglab.org/collective-action-usaid-programming

5. Agrawal, A., & Ostrom, E. (2001). Collective action, property rights, and decentralization in resource use in India and Nepal. Politics & Society, 29, 485–514.; Bodin, Ö. (2017). Collaborative environmental governance: Achieving collective action in social-ecological systems. Science, 357, 6352.; Colfer, C. J. P. (2007). Simple rules for catalyzing collective action in natural resource management contexts. Center for International Forestry Research (CIFOR).; Mahajan, S. L., Jagadish, A., Glew, L., Ahmadia, G., Becker, H., Fidler, R. Y., Jeha, L., Mills, M., Cox, C., DeMello, N., Harborne, A. R., Masuda, Y. J., McKinnon, M. C., Painter, M., Wilkie, D., & Mascia, M. B. (2021). A theory-based framework for understanding the establishment, persistence, and diffusion of community-based conservation. Conservation Science and Practice, 3, e299.

6. Fa, J. E., et al. (2020). Importance of Indigenous Peoples' Lands for the Conservation of Intact Forest Landscapes. Frontiers in Ecology and the Environment, 18(3), 135–140.; Frechette, A., Ginsburg, C., & Walker, W. (2018). Toward a Global Baseline of Carbon Storage in Collective Lands: Indigenous Peoples' and local communities' contributions to climate change mitigation. Washington, DC. Retrieved from https://rightsandresources.org/wp-content/uploads/2018/09/A-Global-Baseline_RRI_Sept-2018.pdf.; Walker, W. S., et al. (2020). The role of forest conversion, degradation, and disturbance in the carbon dynamics of Amazon indigenous territories and protected areas. Proceedings of the National Academy of Science, 117, 3015–3025.

7. Glowacki, L., & von Rueden, C. (2015). Leadership solves collective action problems in small-scale societies. Philosophical Transactions of the Royal Society B: Biological Sciences, 370, 20150010.; Warren, C. (2016). Leadership, social capital and coastal community resource governance: The case of the destructive seaweed harvest in West Bali. Human Ecology, 44, 329–339.; Stein, C., Ernstson, H., & Barron, J. (2011). A social network approach to analyzing water governance: The case of the Mkindo catchment, Tanzania. Physics and Chemistry of the Earth, Parts A/B/C, 36, 1085–1092.; Mascia, M. B., & Mills, M. (2018). When conservation goes viral: The diffusion of innovative biodiversity conservation policies and practices. Conservation Letters, 11, e12442.

8. Barelli, M. (2012). Free, prior and informed consent in the aftermath of the UN Declaration on the Rights of Indigenous Peoples: Developments and challenges ahead. The International Journal of Human Rights, 16, 1–24.; Ribot, J. C., Agrawal, A., & Larson, A. M. (2006). Recentralizing while decentralizing: How national governments reappropriate forest resources. World Development, 34, 1864–1886.; Tomlinson, K. (2019). Indigenous rights and extractive resource projects: Negotiations over the policy and implementation of FPIC. The International Journal of Human Rights, 23, 880–897.

9. Ostrom, E., Gardner, R., & Walker, J. (1994). Rules, Games, and Common-pool Resources (E. Ostrom, R. Gardner, & J. Walker (eds.)). Ann Arbor: University of Michigan Press.

10. van Laerhoven, F., & Ostrom, E. (2007). Traditions and trends in the study of the commons. International Journal of the Commons, 1(1), 3.; van Laerhoven, F., Schoon, M., & Villamayor-Tomas, S. (2020). Celebrating the 30th anniversary of Ostrom's Governing the commons: Traditions and trends in the study of the commons, revisited. International Journal of the Commons, 14(1), 208–24.

11. USAID. (2022). Collective Action Practical Guide. https://usaidlearninglab.org/sites/default/files/2022-07/collective_action_practical_guide_for_usaid_missions_july2022.pdf

12. Gibson, C. C., Williams, J. T., and Ostrom, E. (2005). Local enforcement and better forests. World Development, 33(2), 273-284.; Persha, L., Agrawal, A., & Chhatre, A. (2011). Social and ecological synergy: local rulemaking, forest livelihoods, and biodiversity conservation. Science, 331(6024), 1606-1608.

13. S.C. Jagers, et al. (2020). On the preconditions for large-scale collective action. Ambio, 49 (7), pp. 1282-1296

14. https://www.sciencedirect.com/science/article/pii/S0964569121001903#fn1

15. Kerr, J. (2007). Watershed management: Lessons from common property theory. International Journal of the Commons, 1(1), 89–109.; Armstrong, A., Stedman, R., & Tucker, G. (2019). Beyond 'us and them': Why do landowners disagree about local water pollution? Society & Natural Resources, 32(11), 1200–1221.

16. Araral, E. (2014). Ostrom, Hardin and the commons: A critical appreciation and a revisionist view. Environmental Science and Policy, 36, 11–23.; Kerr, J. (2007). Watershed management: Lessons from common property theory. International Journal of the Commons, 1(1), 89–109.; Villamayor-Tomas, S., et al. (2019). Diagnosing the role of the state for local collective action: Types of action situations and policy instruments. Environmental Science & Policy, 97, 44–57.

17. Kerr, J. (2007). Watershed management: Lessons from common property theory. International Journal of the Commons, 1(1), 89–109.

18. S.C. Jagers, et al. (2020). On the preconditions for large-scale collective action. Ambio, 49 (7), pp. 1282-1296

19. M. Levi. (2006). Why we need a new theory of government. Perspect. Polit., 4 (1), pp. 5-19.; A. Arias. (2015). Understanding and managing compliance in the nature conservation context. J. Environ. Manag., 153, pp. 134-143

20. E. Ostrom. (1998). A behavioral approach to the rational choice theory of collective action Am. Polit. Sci. Rev., 92, pp. 1-22.; A. Rapoport, D.V. Budescu, R. Suleiman, E. Weg. (1992). Social dilemmas with uniformly distributed resources. W.B.G. Liebrand, D.M. Messick, H.A.M. Wilke (Eds.), Social Dilem- Mas: Theoretical Issues and Research Findings, Pergamon Press, Elmsford, pp. 43-57.; Adsera, C. Boix, M. Payne. (2003). Are you being served? Political accountability and quality of government J. Law Econ. Org., 19 (2), pp. 445-490.; P. Bardhan, J. Dayton-Johnson. (2000). Heterogeneity and commons management. Paper Presented at the Proceedings of the 8th International Conference on Common Property, IASCP, Bloomington, Indiana.; E. Ostrom. (2010). Polycentric systems for coping with collective action and global environmental change. Glob. Environ. Chang., 20, pp. 550-557.; G. Hardin. (2009). The tragedy of the commons. J. Nat. Resour. Pol. Res., 1 (3), pp. 243-253.; M. Messick, H. Wilke, M.B. Brewer, R.M. Kramer, P.E. Zemke, L. Lui. (1983). Individual adaptations and structural change as solutions to social dilemmas. J. Pers. Soc. Psychol., 44, pp. 294-309.; Edmunds, D., & Wollenberg, E. (2001). A strategic approach to multistakeholder negotiations. Development and Change, 32, 231–253.; Warner, J. (2016). Multi-stakeholder platforms for integrated water management. Routledge.

21. Bujold, P. M., Williamson, K., & Thulin, E. (2020). The Science of Changing Behavior for Environmental Outcomes: A Literature Review. Rare Center for Behavior & the Environment and the Scientific and Technical Advisory Panel to the Global Environment Facility.

22. Rare Center for Behavior and the Environment. 2021. Levers of Behavior Change. https://behavior.rare.org/wp-content/uploads/2021/07/Understanding-Behavior-Change-Levers-and-Strategies-scroll-July-2021-.pdf

23. Pugel, K., Javernick-Will, A., Linden, K. (2019). What is a collective action approach and what makes it effective? - a desk review

24. Latour, B. (2005). Reassembling the social: An introduction to actor-network-theory. Oxford: Oxford University Press.

25. Argüello, G. (2021). Large-scale collective action in the Arctic Ocean: the role of international organizations in climate governance,

26. Smith, S. R., Christie, I., and Willis, R. (2020). Social tipping intervention strategies for rapid decarbonization need to consider how change happens. Proceedings of the National Academy of Sciences, 117(20), 10629–10630.

27. Khoo, J. (2018). Interface: Networks – lessons learnt turning nets into carpet. In Charter, M. (Ed.), Designing for the circular economy (1st ed., pp. 326–335): Routledge.

28. Dawson, N. M., et al. (2018). Barriers to equity in REDD+: Deficiencies in national interpretation processes constrain adaptation to context. Environmental Science and Policy, 88, 1–9.; Friedman, R. S., et. al. (2018). How just and just how? A systematic review of social equity in conservation research. Environmental Research Letters, 13(5), 053001.; Martin, A., et al. (2020). Environmental justice and transformations to sustainability. Environment: Science and Policy for Sustainable Development, 62(6), 19–30.; Myers, R. et. al. (2018). Messiness of forest governance: How technical approaches suppress politics in REDD+ and conservation projects. Global Environmental Change, 50, 314–324.

29. Manfredo, M. J., Teel, T. L., Sullivan, L., and Dietsch, A. M. (2017). Values, trust, and cultural backlash in conservation governance: The case of wildlife management in the United States. Biological Conservation, 214, 303–311.; Stern, M. J., and Baird, T. D. (2015). Trust ecology and the resilience of natural resource management institutions. Ecology and Society, 20(2).; Fariss B., demello N., Powlen K.A., Latimer C.E., Masuda Y, and Kennedy C.M. (2021). Identifying Catalysts of Success in Community-based Conservation. Conservation Biology

30. Official development assistance (ODA) is defined by the OECD Development Assistance Committee (DAC) as government aid that promotes and specifically targets the economic development and welfare of developing countries.

31. Conservation International. (2019). Guidelines for Integrating Gender & Social Equity Into Conservation Programming.; Rare. (2019). Environment and Social Safeguards Policies and Procedures Manual Version 1.; World Bank. 2018. Environmental and Social Framework. https://www.worldbank.org/en/projects-operations/environmental-and-social-framework ; World Wildlife Fund. 2019. WWF's Environmental and Social Safeguards Framework.; ICCA Consortium. (2022). Decolonizing conservation in the post-2020 Global Biodiversity Framework.

32. Giordano, M. (2003). The Geography of the Commons: The Role of Scale and Space. Annals of the Association of American Geographers, 93(2), 365-75.; Ostrom, E. (2015). Governing the Commons: The Evolution of Institutions for Collective Action (Canto Classics, pp. I-lv). Cambridge: Cambridge University Press.

33. Niemiec, R., McCaffrey, S., Jones, M. (2020). Clarifying the degree and type of public good collective action problem posed by natural resource management challenges. Ecology and Society 25(1): 30.

34. Schultz, C.A., Thompson, M.P., McCaffrey, and S.M. (2019). Forest Service Fire Management and the Elusiveness of Change. Fire Ecol. 15:13; Brummel, R.F., Nelson, K.C., and Jakes, P.J. (2012). Burning through Organizational Boundaries? Examining Inter-Organizational Communication Networks in Policy-Mandated Collaborative Bushfire Planning Groups. Glob. Environ. Chang. 22: 516–528.

35. Steelman, T. (2016). U.S. Wildfire Governance as Social-Ecological Problem. Ecol.Soc., 21.; Almstedt, A. and Reed, M.G. (2013). Introducing a Framework for Good and Adaptive Governance: An Application to Fire Management Planning in Canada's Boreal Forest. For.Chron. 89: 664–674.

36. Kocher, S.D., Toman, E., Trainor, S.F., et al. (2012). How Can We Span the Boundaries between Wildland Fire Science and Management in the United States? J.For., 110: 421–428.; Colavito, M.M., Trainor, S.F., Kettle, N.P., and York, A. (2019). Making the Transition from Science Delivery to Knowledge Coproduction in Boundary Spanning: A Case Study of the Alaska Fire Science Consortium. WeatherClim.Soc.,11: 917-934.; Crona, B.I. and Parker, J.N. (2012). Learning in Support of Governance: Theories, Methods, and a Framework to Assess How Bridging Organizations Contribute to Adaptive Resource Governance. Ecol. Soc. 17: 32.

37. Feldman, D., Brockway, A., Ulrich, E., and Margolis, R. (2015). Shared Solar: Current Landscape, Market Potential, and the Impact of Federal Securities Regulation.

38. Morris, J., Ensor, J.E., Pfeifer, C., et al. (2020). Games as Boundary Objects: Charting Trade-Offs in Sustainable Livestock Transformation. Int. J. Agric. Sustain. 1–24.; Zurba, M., Maclean, K., Woodward, E., and Islam, D. (2019). Amplifying Indigenous Community Participation in Place-Based Research Through Boundary Work. Prog. Hum. Geogr. 43: 1020–1043.

39. CGIAR Program on Collective Action and Property Rights (CAPRi). (2010). Collective action and property rights for sustainable development. In Resources, rights, and cooperation: A sourcebook on property rights and collective action for sustainable development, CGIAR Program on Collective Action and Property Rights (CAPRi). Fundamentals of Collective Action and Property Right, Chapter 1, Pp. 3-8. Washington, DC: International Food Policy Research Institute (IFPRI). https://ebrary.ifpri.org/digital/collection/p15738coll2/id/133871

40. CGIAR Program on Collective Action and Property Rights (CAPRi). (2010). Collective action and property rights for sustainable development. In Resources, rights, and cooperation: A sourcebook on property rights and collective action for sustainable development, CGIAR Program on Collective Action and Property Rights (CAPRi). Fundamentals of Collective Action and Property Right, Chapter 1, Pp. 3-8. Washington, DC: International Food Policy Research Institute (IFPRI). https://ebrary.ifpri.org/digital/collection/p15738coll2/id/133871

41. Coleman, K. and Stern, M.J. (2018). Boundary Spanners as Trust Ambassadors in Collaborative Natural Resource Management. J. Environ. Plan. Manag. 61: 291–308.; Miller, C. 2001. Hybrid Management: Boundary Organizations, Science Policy, and Environmental Governance in the Climate Regime. Sci. Technol. Hum. Values. 26: 478–500.; Nel, J.L., Roux, D.J., Driver, A., et al. (2016). Knowledge Co-Production and Boundary Work to Promote Implementation of Conservation Plans: Conservation Planning for Implementation. Conserv. Biol. 30: 176–188.; Fudge, M. and Hiruy, K. (2019). Linked Boundary Functions: Examining the Role of Research for Development Organizations in Integrating Levels of Resource Governance. Soc. Nat. Resour. 32: 255–274.

42. Cutts, B.B., White, D.D., and Kinzig, A.P. (2011). Participatory Geographic Information Systems for the Co-Production of Science and Policy in an Emerging Boundary Organization. Environ. Sci. Policy.14: 977–985.; Guston, D.H. (1999). Stabilizing the Boundary between US Politics and Science: The Role of the Office of Technology Transfer as a Boundary Organization. Soc. Stud. Sci. 29: 87–111.

43. USAID. (2016). Systems and Complexity White Paper. https://usaidlearninglab.org/resources/systems-and-complexity-white-paper

44. Schotter, A., Mudambi, R., Doz, Y. and Gaur, A. (2017). Boundary spanning in global organizations. Journal of Management Studies, 54, 403– 21.

45. Quick, K.S. and Feldman, M.S. (2014). Boundaries as Junctures: Collaborative Boundary Work for Building Efficient Resilience. J. Public Adm. Res.Theory. 24: 673–695.

46. Koehrsen, J. (2017). Boundary Bridging Arrangements: A Boundary Work Approach to Local Energy Transitions. Sustainability. 9: 424.

47. Levina, N. and Vaast, E. (2005). The Emergence of Boundary Spanning Competence in Practice: Implications for Implementation and Use of Information Systems. MIS Quarterly, 29: 2.

48. Løvschal M., Bøcher P., Pilgaard J., et al. (2017). Fencing bodes a rapid collapse of the unique Greater Mara ecosystem. Sci Rep- UK7: 1– 7.

49. Li W. and Huntsinger L. (2011). China's grassland contract policy and its impacts on herder ability to benefit in Inner Mongolia: tragic feedbacks. Ecol Soc16: 1.; Fernandez- Gimenez M.E. (2002). Spatial and social boundaries and the paradox of pastoral land tenure. Hum Ecol 30: 49– 78.

50. Wu Z. and Du W. (2008). Pastoral nomad rights in Inner Mongolia. Nomadic Peoples12: 13– 33.

51. Reid R.S., Fernández- Giménez M.E., and Galvin K.A. (2014). Dynamics and resilience of rangelands and pastoral peoples around the globe. Annu Rev Env Resour 39: 217– 42.; Centner T.J. (2000). Coordinating fence law with range management strategies in the USA. Environ Conserv 27: 201– 07

52. Cronon W. (1983). Changes in the land: Indians, colonists, and the ecology of New England. New York, NY: Hill and Wang.

53. Normand S., Høye T.T., Forbes B.C., et al. (2017). Legacies of historical human activities in Arctic woody plant dynamics. Annu Rev Env Resour 42: 541– 67.; Rohde R.F. and Hoffman M.T. (2008). One hundred years of separation: the historical ecology of a South African "coloured reserve". Africa 78: 189– 222.; Williams D.M. (2002). Beyond great walls: environment, identity, and development on the Chinese grasslands of Inner Mongolia. Palo Alto, CA: Stanford University Press.

54. Pugel, K., Javernick-Will, A., Linden, K. (2019). What is a collective action approach and what makes it effective? - a desk review.

55. Cohen-Chen, S., & Van Zomeren, M. (2018). Yes we can? Group efficacy beliefs predict collective action, but only when hope is high. Journal of Experimental Social Psychology, 77, 50–59.

56. van Zomeren, M., Leach, C. W., and Spears, R. (2012). Protesters as "Passionate Economists": A dynamic dual pathway model of approach coping with collective disadvantage. Personality and Social Psychology Review, 16(2), 180–199.

57. Beaton, A. M., and Deveau, M. (2005). Helping the less fortunate: A predictive model of collective action. Journal of Applied Social Psychology, 35(8), 1609–1629.

58. Pugel, K., Javernick-Will, A., Linden, K. (2019). What is a collective action approach and what makes it effective? - a desk review.

59. Hardin, G. (2009). The tragedy of the commons. J. Nat. Resour. Pol. Res., 1 (3), pp. 243-253.

60. Messick, M., H. Wilke, M.B. Brewer, R.M. Kramer, P.E. Zemke, and L. Lui. (1983). Individual adaptations and structural change as solutions to social dilemmas. J. Pers. Soc. Psychol., 44, pp. 294-309.

61. Pugel, K., Javernick-Will, A., Linden, K. (2019). What is a collective action approach and what makes it effective? - a desk review

62. Charnley, S., E.C. Kelly, and P. Fischer. (2020). Fostering collective action to reduce wildfire risk across property boundaries in the American West. Environmental Research Letters 15: 1–15.

63. CEO Water Mandate. (2013). Guide to Water-Related Collective Action.

64. CEO Water Mandate. (2013). Guide to Water-Related Collective Action.

65. CEO Water Mandate. (2013). Guide to Water-Related Collective Action.

66. A. Rapoport, D.V. Budescu, R. Suleiman, and E. Weg. (1992). Social dilemmas with uniformly distributed resources. W.B.G. Liebrand, D.M. Messick, H.A.M. Wilke (Eds.), Social Dilem- Mas: Theoretical Issues and Research Findings, Pergamon Press, Elmsford, pp. 43-57.

67. Adsera, C. Boix, and M. Payne. (2003). Are you being served? Political accountability and quality of government. J. Law Econ. Org., 19 (2), pp. 445-490.

68. United Nations Development Programme. (2012). The Power of Local Action: Lessons from 10 Years of the Equator Prize. New York, NY: UNDP.

69. CEO Water Mandate. (2013). Guide to Water-Related Collective Action.

70. United Nations Development Programme. (2012). The Power of Local Action: Lessons from 10 Years of the Equator Prize. New York, NY: UNDP.

71. CEO Water Mandate. (2013). Guide to Water-Related Collective Action.

72. Pugel, K., Javernick-Will, A., Linden, K. (2019). What is a collective action approach and what makes it effective? - a desk review.

73. Pugel, K., Javernick-Will, A., Linden, K. (2019). What is a collective action approach and what makes it effective? - a desk review.

74. United Nations Development Programme. (2012). The Power of Local Action: Lessons from 10 Years of the Equator Prize. New York, NY: UNDP.

75. Hill, R., et al. (2020). Working with Indigenous, local and scientific knowledge in assessments of nature and nature's linkages with people. Current Opinion in Environmental Sustainability, 43, 8–20.; Adade Williams, P., Sikutshwa, L., and Shackleton, S. 2020. Acknowledging Indigenous and Local Knowledge to Facilitate Collaboration in Landscape Approaches—Lessons from a Systematic Review. Land, 9(9), 331.

76. Jones, I., et al. (2020). Improving rural health care reduces illegal logging and conserves carbon in a tropical forest. Proceedings of the National Academy of Sciences of the United States of America, 117, 28515–28524.; Brooks, J. S. (2017). Design features and project age contribute to joint success in social, ecological, and economic outcomes of community-based conservation projects. Conservation Letters, 10, 23–32.

77. Tulley, B. (2018). How belonging and social proof inspired sustainable fishing in Mongolia. https://medium.com/in-rare-form/how-belonging-and-socialproof-inspired-sustainable-fishing-in-mongolia-73b38f3aa9ca.

78. United Nations Development Programme. (2012). The Power of Local Action: Lessons from 10 Years of the Equator Prize. New York, NY: UNDP.

79. United Nations Development Programme. (2012). The Power of Local Action: Lessons from 10 Years of the Equator Prize. New York, NY: UNDP.

80. Pretty, J. (2003). Social capital and the collective management of resources. Science, 302, 1912–1914.; Ostrom, E. (2009). A general framework for analyzing sustainability of social-ecological systems. Science, 325, 419–422.; Lockwood, M. (2010). Good governance for terrestrial protected areas: A framework, principles and performance outcomes. Journal of Environmental Management, 91, 754–766.

81. Carine P., Labeyrie, V., and Polge, E. (2019). Collective action in Localized Agrifood Systems: An analysis by the social networks and the proximities. Study of a Serrano cheese producers' association in the Campos de Cima da Serra/Brazil. Journal of Rural Studies, 72, 58-74.

82. https://rare.org/program/lands-for-life/

83. https://sepapower.org/resource/community-solar-program-designs-2018-version/

84. Bandura, A. (1995) Self-Efficacy in Changing Societies. Cambridge: Cambridge University Press.; Bandura, A. (1997). Self-Efficacy: The Exercise of Control. New York: Freeman.; Bandura A. (2018). Toward a psychology of human agency: Pathways and reflections. Perspectives on Psychological Science, 13, 130–136.; van Zomeren, M., Postmes, T., and Spears, R. (2008). Toward an integrative social identity model of collective action: A quantitative research synthesis of three socio-psychological perspectives. Psychological Bulletin, 34, 504–535.

85. Grothmann, T., and Reusswig, F. (2006). People at Risk of Flooding: Why Some Residents Take Precautionary Action While Others Do Not. Natural Hazards 38 (1–2).; Poussin, J. K., W. J. W. Botzen, and J. C. J. H. Aerts. (2014). Factors of Influence on Flood Damage Mitigation Behaviour by Households. Environmental Science and Policy 40, 69–77.

86. Becker, G., J. C. J. H. Aerts, and D. Huitema. (2014). Influence of Flood Risk Perception and Other Factors on Risk-Reducing Behavior: A Survey of Municipalities along the Rhine. Journal of Flood Risk Management 7 (1), 16–30.

87. Grothmann, T., and Reusswig, F. (2006). People at Risk of Flooding: Why Some Residents Take Precautionary Action While Others Do Not. Natural Hazards 38 (1–2).; Bubeck, P., W. J. W. Botzen, and J. C. J. H. Aerts. (2012).“A Review of Risk Perceptions and Other Factors That Influence Flood Mitigation Behavior. Risk Analysis 32 (9), 1481–1495.

88. Babcicky, P., and Seebauer, S. (2020). Collective efficacy and natural hazards: differing roles of social cohesion and task-specific efficacy in shaping risk and coping beliefs, Journal of Risk Research, 23:6, 695-712.

89. Babcicky, P., and Seebauer, S. (2020). Collective efficacy and natural hazards: differing roles of social cohesion and task-specific efficacy in shaping risk and coping beliefs, Journal of Risk Research, 23:6, 695-712.

90. Ostrom, E. (2007). A diagnostic approach for going beyond panaceas. Proceedings of the National Academy of Sciences, USA 104, 15181–15187.

91. Gneezy, U., Meier, S., and Rey-Biel, P. (2011). When and why incentives (don't) work to modify behavior. Journal of Economic Perspectives, 25 (4), 191-210.

92. Ostrom, E. (1998). A behavioral approach to the rational choice theory of collective action. Am. Polit. Sci. Rev., 92, 1-22.; Knight, R., Brinkhurst, M., and Vogelsang, J. (2016). Community land protection facilitator's guide.; Warren, C., and Visser, L. (2016). The local turn: An introductory essay revisiting leadership, elite capture and good governance in Indonesian conservation and development programs. Human Ecology, 44, 277–286.

93. Pugel, K., Javernick-Will, A., and Linden, K. (2019). What is a collective action approach and what makes it effective? - a desk review.

94. Pugel, K., Javernick-Will, A., Linden, K. (2019). What is a collective action approach and what makes it effective? - a desk review.; Rycroft-Malone, J., Burton, C., Wilkinson, J., et al. (2015). Collective action for knowledge mobilization: a realist evaluation of the Collaborations for Leadership in Applied Health Research and Care. Southampton (UK): NIHR Journals Library; (Health Services and Delivery Research, No. 3.44.) Chapter 7, Discussion, conclusions and implications.

95. https://rare.org/pride-on-our-plates/

96. United Nations Development Programme. (2012). The Power of Local Action: Lessons from 10 Years of the Equator Prize. New York, NY: UNDP.

97. Covey, S. (2022). Trust and Inspire: How Truly Great Leaders Unleash Greatness in Others.

98. Stern, M. J., and Baird, T. D. (2015). Trust ecology and the resilience of natural resource management institutions. Ecology and Society, 20, art14.; Metcalf, E. C., Mohr, J. J., Yung, L., Metcalf, P., and Craig, D. (2015). The role of trust in restoration success: Public engagement and temporal and spatial scale in a complex social-ecological system. Restoration Ecology, 23, 315–324.

99. Olson, M. (1971). The Logic of Collective Action: Public Goods and the Theory of Groups (Revised ed.). Harvard University Press.

100. Bano, M. (2012). Breakdown in Pakistan: How Aid is Eroding Institutions for Collective Action, Stanford University Press, Stanford, CA.

101. Coleman, J.S. (1988). Social capital in the creation of human capital. Am J Sociol 94, 95–120.

102. Pugel, K., Javernick-Will, A., and Linden, K. (2019). What is a collective action approach and what makes it effective? - a desk review.

103. CGIAR Program on Collective Action and Property Rights (CAPRi). (2010). Collective action and property rights for sustainable development. In Resources, rights, and cooperation: A sourcebook on property rights and collective action for sustainable development, CGIAR Program on Collective Action and Property Rights (CAPRi). Fundamentals of Collective Action and Property Right, Chapter 1, Pp. 3-8. Washington, DC: International Food Policy Research Institute (IFPRI). https://ebrary.ifpri.org/digital/collection/p15738coll2/id/133871

104. https://rare.org/program/climate-culture/entertainment-lab/

105. Clapp, J. and Swanston, L. (2009). Doing away with plastic shopping bags: International patterns of norm emergence and policy implementation. Environmental Politics, 18, 315–332.

106. Adeyanju, G., Augustine, T., et. al. (2021). Effectiveness of intervention on behavior change against use of non-biodegradable plastic bags: a systematic review. Discover Sustainability, 2.

107. Kloblauch, D., Mederake L., and Stein U. (2018). Developing countries in the lead: What drives the diffusion of plastic bag policies? Sustainability, 10, 1–24.

108. Dewan, A., Green, K., Li, X., and Hayden, D. (2013). Using social marketing tools to increase fuel-efficient stove adoption for conservation of the golden snub-nosed monkey, Gansu Province, China. Conservation Evidence, 10, 32-36.

109. Gaspart, F., et al. (1998). Participation in the Construction of a Local Public Good with Indivisibilities: An Application to Watershed Development in Ethiopia. Journal of African Economies, Centre for the Study of African Economies (CSAE), vol. 7(2), pages 157-184, July.; White, T. and Runge, C. (1994). “Common Property and Collective Action: Lessons from Cooperative Watershed Management in Haiti.” Economic Development and Cultural Change, 43, 1 - 41.

110. United Nations Development Programme. (2012). The Power of Local Action: Lessons from 10 Years of the Equator Prize. New York, NY: UNDP.

111. S. E. Page. (2008). The Difference: How the Power of Diversity Creates Better Groups, Firms, Schools, and Societies (Princeton University Press, 2008).; Aggarwal, I., Woolley,A., Chabris, C., and Malone, T. (2019). The impact of cognitive style diversity on implicit learning in teams. Front. Psychol. 10, 112.; Hong, L. and S. E. Page. 2004. Groups of diverse problem solvers can outperform groups of high-ability problem solvers. Proc. Natl. Acad. Sci. U.S.A., 101,16385–16389.

112. Markus, H. R. and Kitayama, S. (1991). Culture and the self: implications for cognition, emotion, and motivation. Psychol. Rev., 98, 224–253.

113. Kim H. S., Sherman D. K., and Updegraff J. A. (2016). Fear of Ebola: The influence of collectivism on xenophobic threat responses. Psychological Science, 27(7), 935–944.; Sherman D. K., Updegraff J. A., Handy M. S., Eom K., and Kim H. S. (2022). Beliefs and social norms as precursors of environmental support: The joint influence of collectivism and socioeconomic status. Personality and Social Psychology Bulletin, 48(3), 463–477.; Kim H. S., Eom K., Chuang R., and Sherman D. K. (2021). Psychology and the threat of contagion: Feeling vulnerable to a disease moderates the link between xenophobic thoughts and support for ingroup-protective actions. Personality and Social Psychological Bulletin, 1–18.

114. Trubisky P., Ting-Toomey S., and Lin, S. (1991). The influence of individualism-collectivism and self-monitoring on conflict styles. Int. J. Intercult. Relat., 15, 65–84.; Markus, H. R. and Kitayama, S. (1991). Culture and the self: implications for cognition, emotion, and motivation. Psychol. Rev., 98, 224–253.

115. Arnocky S. et al. (2007). Self-construal predicts environmental concern, cooperation, and conservation. J. Environ. Psychol.; Davis, A.C. and Stroink, M.L., (2016). Within-culture differences in self-construal, environmental concern, and pro environmental behavior. Ecopsychol., 8, 64–73.; Hwang K. and Lee J. (2018). Antecedents and consequences of ecotourism behavior: independent and interdependent self-construals, ecological belief, willingness to pay for ecotourism services and satisfaction with life. Sustainability, 10, 789–807.

116. Chuang, Y., Xie, X., and Liu, C. (2016). Interdependent orientations increase pro environmental preferences when facing self-interest conflicts: the mediating role of self-control. J. Environ. Psychol., 46, 96–105.; Martinsson, P., Myrseth, K.O.R., and Wollbrant, C. (2012). Reconciling pro-social vs. selfish behavior: on the role of self-control. Judg. Decis. Mak. 7, 304.; Seeley, E.A., and Gardner, W.L. (2003). The "Selfless" and self-regulation: the role of chronic other-orientation in averting self-regulatory depletion. Self Ident., 2, 103e117.; S. Arnocky et al. (2007). Self-construal predicts environmental concern, cooperation, and conservation. J. Environ. Psychol.; Xue, W., Hine, D. W., Marks, A. D. G., Phillips, W. J., and Zhao, S. (2016). Cultural worldviews and climate change: a view from China. Asian J. Soc. Psychol., 19, 134–144.; McCarty, J., and Shrum, L. (2001). The influence of individualism, collectivism, and locus of control on environmental beliefs and behavior. J. Public Policy Mark., 20, 93–104.

117. Strunk, D. R. and Chang, E. C. (1999). Distinguishing between fundamental dimensions of individualism–collectivism: relations to sociopolitical attitudes and beliefs. Pers. Individ. Dif., 27,665–671.; Voronov, M. and Singer, J. A. (2002). The myth of individualism-collectivism: a critical review. J. Soc. Psychol., 142, 461–480.; Wagner, J. A. and Moch, M. K. (1986). Individualism–collectivism: concept and measure. Group Organ. Manag., 11, 280–304.; Kim, H. S. and Markus, H. R. (1999). Deviance or uniqueness, harmony or conformity? A cultural analysis. Journal of Personality and Social Psychology, 77(4), 785–800.; Kinias, Z., Kim, H. S., Hafenbrack, A. C., and Lee, J. J. (2014). Standing out as a signal to selfishness: Culture and devaluation of non-normative characteristics. Organizational Behavior and Human Decision Processes, 124(2), 190–203.; Leung, K. and Bond, M. H. (1984). The impact of cultural collectivism on reward allocation. Journal of Personality and Social Psychology, 47(4), 793–804.; Markus, H. R. and Kitayama, S. (1991). Culture and the self: implications for cognition, emotion, and motivation. Psychol. Rev., 98, 224–253.; Triandis, H. C. (1989). The self and social behavior in differing cultural contexts. Psychological Review, 96(3), 506–520.; Hui, C. H. and Triandis, H. C.

(1986). Individualism-collectivism: A study of cross-cultural researchers. Journal of Cross-Cultural Psychology, 17(2), 225–248.

118. Hwang, K. and Lee, J. (2018). Antecedents and consequences of ecotourism behavior: independent and interdependent self-construals, ecological belief, willingness to pay for ecotourism services and satisfaction with life. Sustainability, 10, 789–807.; Cho, Y. N., Thyroff, A., Rapert, M. I., Park, S. Y., and Lee H. J. (2013). To be or not to be green: exploring individualism and collectivism as antecedents of environmental behavior. J. Bus. Res., 66,1052–1059.; Dunlap, R. E. and Liere, K. D. (1984). Commitment to the dominant social paradigm and concern for environmental quality. Soc. Sci. Quart., 65, 1013–1028.; Kim, Y. (2005). Antecedents of green purchase behavior: an examination of collectivism, environmental concern, and PCE. Adv. Consum. Res., 32, 592–599.; Semenova, M. (2015). Individualism Vs. Collectivism: Effect on our Pro-environmental Behavior. Master's thesis. New Zealand: University of Otago.

119. Savani, K., Morris, M. W., and Naidu, N.V.R. (2012). Deference in Indian's decision making: Introjected goals or injunctive norms? Journal of Personality and Social Psychology, 102(4), 685–699.; Travaglino, G. A. and Moon, C. (2021). Compliance and self-reporting during the COVID-19 pandemic: A cross-cultural study of trust and self-conscious emotions in the United States, Italy, and South Korea. Frontiers in Psychology, 12.

120. Bardhan, P. and Dayton-Johnson, J. (2000). Heterogeneity and commons management. Paper Presented at the Proceedings of the 8th International Conference on Common Property, IASCP, Bloomington, Indiana.; E. Ostrom. (2010). Polycentric systems for coping with collective action and global environmental change. Glob. Environ. Chang., 20, 550-557.

121. USAID. 2017. Co-Creation Discussion Note. https://usaidlearninglab.org/sites/default/files/resource/files/co_creation_discussion_note_august_13_2017_final.pdf

122. Tversky, A. and Kahneman, D. (1981). The framing of decisions and the psychology of choice. Science, 211(4481), 453-458.; Rabin, M. and Thaler, R. H. (2001). Anomalies: risk aversion. Journal of Economic perspectives, 15(1), 219-232.; Kahneman, D., Knetsch, J. L., and Thaler, R. H. (1991). Anomalies: The endowment effect, loss aversion, and status quo bias. Journal of Economic Perspectives, 5(1), 193-206.; Nickerson, R. S. (1998). Confirmation bias: A ubiquitous phenomenon in many guises. Review of General Psychology, 2(2), 175.; Tversky, A. and Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. Science, 185(4157), 1124-1131; Rare and The Behavioural Insights Team. 2019. Behavior Change For Nature: A Behavioral Science Toolkit for Practitioners. Arlington, VA: Rare.

123. Keshkamat, S.S., Kooiman, A., vanMaarseveen, M.F.A.M., vanderVeen, A., and Zuidgeest, M.H.P.A (2012). Boundary Object for Scale Selection — Moderating Differences and Synergising Understanding. Ecol.Econ. 76, 15–24.

124. Keshkamat, S.S., Kooiman, A., vanMaarseveen, M.F.A.M., vanderVeen, A., and Zuidgeest, M.H.P.A (2012). Boundary Object for Scale Selection — Moderating Differences and Synergising Understanding. Ecol.Econ. 76, 15–24.

125. Harper, C. A., Satchell, L. P., Fido D., and Latzman, R. D. (2020). Functional fear predicts public health compliance in the COVID-19 pandemic. International Journal of Mental Health and Addiction.

126. Trimble, M. and Johnson, D. (2013). Artisanal fishing as an undesirable way of life? The implications for governance of fishers' well being aspirations in coastal Uruguay and southeastern Brazil. Marine Policy 37(1), 37–44.; Santos, A.N. (2015). Fisheries as a way of life: Gendered

127. Dekens, J. (2017). Strengthening gender considerations in the Kiribati National Adaptation Plan (NAP) Process. NAP Global Network. International Institute for Sustainable Development.; Kronen, M. and Vunisea, A. (2007). Women never hunt…but fish: Highlighting equality for women in policy formulation and strategic planning in the coastal fisheries sector in Pacific Island countries. SPC Women In Fisheries Information Bulletin, 17, 3–15.

128. Lawless, S., Cohen, P., Mangubhai, S., Kleiber, D. and Morrison, T. (2021). Gender equality is diluted in commitments made to small-scale fisheries. World Development, 123, article 104287.

129. Pacific Community. (2021) SPC Women in Fisheries Information Bulletin #33. ISSN 1028-7752.

130. Advancing Learning and Innovation on Gender Norms. (2020) Gender, power and progress: How norms change. https://www.alignplatform.org/gender-power-progress; Advancing Learning and Innovation on Gender Norms. 2019. Quantitative measurement of gendered social norms. https://www.alignplatform.org/sites/default/files/2019-02/social_norms_for_align_1.pdf;

131. Keshkamat, S.S., Kooiman, A., vanMaarseveen, M.F.A.M., vanderVeen, A., and Zuidgeest, M.H.P.A (2012). Boundary Object for Scale Selection — Moderating Differences and Synergising Understanding. Ecol.Econ. 76, 15–24.

132. Lind, E. A., and Tyler, T. R. (1988). The social psychology of procedural justice. Springer Science & Business Media.; Martin A., Gross-Camp N., and Akol A. 2015. Towards an explicit justice framing of the social impacts of conservation. Conservation and Society, 13, 166– 178.

133. Mariki, S. B., Svarstad, H., and Benjaminsen, T. A. (2015). Elephants over the cliff: Explaining wildlife killings in Tanzania. Land Use Policy, 44, 19– 30.; Raycraft, J. (2020). The (un)making of marine park subjects: Environmentality and everyday resistance in a coastal Tanzanian village. World Development, 126, 104696.; Booth, A., and Halseth, G. (2011). Why the public thinks natural resources public participation processes fail: A case study of British Columbia communities. Land Use Policy, 28, 898– 906.

134. Reyes-García, V., and Benyei, P. (2019). Indigenous knowledge for conservation. Nature Sustainability, 2, 657– 658.

135. Agrawal, A. and Ribot, J. (1999). Accountability in decentralization: A framework with South Asian and West African cases. The Journal of Developing Areas, 33, 473– 502.

136. Ribot, J. C., Agrawal, A., and Larson, A. M. (2006). Recentralizing while decentralizing: How national governments reappropriate forest resources. World Development, 34, 1864– 1886.

137. Agrawal, A. and Ribot, J. (1999). Accountability in decentralization: A framework with South Asian and West African cases. The Journal of Developing Areas, 33, 473– 502.; Schlosberg, D. (2007). Defining environmental justice: Theories, movements, and nature. Oxford University Press.

138. Lind, E. A., and Tyler, T. R. (1988). The social psychology of procedural justice. Springer Science & Business Media.; Tyler, T. R. (1989). The psychology of procedural justice. Journal of Personality and Social Psychology, 1, 830– 838.

139. Leventhal, G. (1980). What should be done with equity theory? New approaches to the study of justice in social relationships. In M.S. Gergen and R.W. Greenberg (Eds.), Social exchange theory. New York: Plenum.

140. Tyler, T. R. (1989). The psychology of procedural justice. Journal of Personality and Social Psychology, 1, 830– 838.; Lecuyer, L., White, R. M., Schmook, B., Lemay, V., and Calm, S. (2018). The construction of feelings of justice in environmental management: An empirical study of multiple biodiversity conflicts in Calakmul. Journal of Environmental Management, 213, 363– 373.

141. Gurney, G. G., Pressey, R. L., Cinner, J. E., Pollnac, R., and Campbell, S. J. (2015). Integrated conservation and development: Evaluating a community-based marine protected area project for equality of socioeconomic impacts. Philosophical Transactions of the Royal Society B: Biological Sciences, 370, 20140277.; Dawson, N., Martin, A., and Danielsen, F. (2018). Assessing equity in protected area governance: Approaches to promote just and effective conservation. Conservation Letters, 11, 1– 8.

142. Whyte, K. (2020). Too late for indigenous climate justice: Ecological and relational tipping points. WIREs Climate Change, 11, e603.

143. Zafra-Calvo, N. et al. (2019). Progress toward equitably managed protected areas in Aichi Target 11: A global survey. Bioscience, 69, 191– 197.

144. Reed, M. S., et al. (2018). A theory of participation: What makes stakeholder and public engagement in environmental management work ? Restoration Ecology, 26, 7– 17.; de Vente, J., Reed, M. S., Stringer, L. C., Valente, S., and Newig, J. (2016). How does the context and design of participatory decision making processes affect their outcomes? Evidence from sustainable land management in global drylands. Ecology and Society, 21, 24.

145. Zafra-Calvo, N., et al. (2017). Towards an indicator system to assess equitable management in protected areas. Biological Conservation, 211, 134– 141.; Schreckenberg, K., Franks, P., Martin, A., and Lang, B. (2016). Unpacking equity for protected area conservation. Parks, 22, 11– 28.

146. Ruano-Chamorro, C., Gurney, G. G., and Cinner, J. E. (2022). Advancing procedural justice in conservation. Conserv. Lett. 15 (3), e12861.

147. Pretty, J. (2003). Social capital and the collective management of resources. Science, 302, 1912–1914.

148. Narayan, D., and Pritchett, L. (1999). Cents and Sociability: Household Income and Social Capital in Rural Tanzania. Economic Development and Cultural Change, 47 (4), 870–897.

149. Pretty, J. (2003). Social capital and the collective management of resources. Science, 302,1912–1914.

150. Ruano-Chamorro, C., Gurney, G. G., and Cinner, J. E. (2022). Advancing procedural justice in conservation. Conserv. Lett., 15 (3), e12861.

151. Ruano-Chamorro, C., Gurney, G. G., and Cinner, J. E. (2022). Advancing procedural justice in conservation. Conserv. Lett., 15 (3), e12861.

152. Martin, A., Coolsaet, B., Corbera, E., Dawson, N. M., Fraser, J. A., Lehman, I., and Rodriguez, I. (2016). Justice and conservation: The need to incorporate recognition. Biological Conservation, 197, 254– 261.

153. DeCremer, D., and Tyler, T. R. (2005). Managing group behavior: the interplay between procedural justice, sense of self, and cooperation. Advances in Experimental Social Psychology, 37, 151– 218.

154. Schreckenberg, K., Franks, P., Martin, A., and Lang, B. (2016). Unpacking equity for protected area conservation. Parks, 22, 11– 28.

155. TNC Power Analysis https://tnc.app.box.com/s/8gohpf9n3lghverwssf7c9grpcjmikrv/file/939193472994

156. United Nations Development Programme. (2012). The Power of Local Action: Lessons from 10 Years of the Equator Prize. New York, NY: UNDP.

157. Ostrom, E. (1992). Crafting institutions for self-governing irrigation systems. ICS Press, San Francisco, CA.

158. Ostrom, E.(1990). Governing the commons: The evolution of institutions for collective action. Cambridge University Press, New York, NY.

159. Kishor, S. and Subaiya, L. (2008). Understanding women's empowerment: A comparative analysis of demographic and health surveys (DHS) data. DHS Comparative Reports No. 20. Calverton, MD: Macro International Inc.

160. Doss, C. and Meinzen-Dick, R. (2015). Collective Action within the Household: Insights from Natural Resource Management, World Development, 74,171-183.

161. Varughese, G. and Ostrom, E. (2001) The Contested Role of Heterogeneity in Collective Action: Some Evidence from Community Forestry in Nepal. World Development, 29(5), 747– 65.

162. Gibson, C. and Koontz, T. (1998) When 'community' is not enough: Institutions and values in community-based forest management in Southern Indiana. Human Ecology, 26, 621-647.; Keen, M., Brown, V.A., and Dyball, R. (2005). Social Learning in Environmental Management: Towards a Sustainable Future, Earthscan, London.; Ostrom, E. (1990). Governing the Commons: The Political Economy of Institutions and Decisions, Cambridge University Press, Cambridge.

163. Goldstein, N. J., Cialdini, R. B., and Griskevicius, V. (2008). A room with a viewpoint: Using social norms to motivate environmental conservation in hotels. Journal of Consumer Research, 35, 472–482.; Reese, G., Loeschinger, D. C., Hamann, K., and Neubert, S. (2013). Sticker in the box! Object-person distance and descriptive norms as means to reduce waste. Ecopsychology, 5, 146–148.

164. Pugel, K., Javernick-Will, A., Linden, K. (2019). What is a collective action approach and what makes it effective? - a desk review.

165. Bujold, P. M., Williamson, K., and Thulin, E. (2020). The Science of Changing Behavior for Environmental Outcomes: A Literature Review. Rare Center for Behavior & the Environment and the Scientific and Technical Advisory Panel to the Global Environment Facility.

166. Chabe-Ferret, S., Le Coent, P., Reynaud, A., Subervie, J., and Lepercq, D. (2019). Can we Nudge Farmers into Saving Water? Evidence from a Randomised Experiment. European Review of Agricultural Economics, 46(3), 393– 416.

167. Ayres, I., Raseman, S., and Shih, A. (2013). Evidence from two large field experiments that peer comparison feedback can reduce residential energy usage. J. Law Econ. Organiz., 29, 992–1022.; Allcott, H. (2011). Social norms and energy conservation. J. Public Econ., 95, 1082–1095.

168. Bicchieri, C., Dimant, E., G¨achter, S., et al. (2020) Observability, social proximity, and the erosion of norm compliance.; Prentice, D. and Paluck, E.L. (2020) Engineering social change using social norms: Lessons from the study of collective action. Current Opinion in Psychology.

169. Green, K., Crawford, B., Williamson, K.A., and DeWan, A.A. (2019). A meta-analysis of social marketing campaigns to improve global conservation outcomes. Social Marketing Quarterly, 25(1),69-87.

170. Hamann, A., Roberts, D.R., Barber, Q.E., Carroll, C., and Nielsen, S.E. (2015). Velocity of climate change algorithms for guiding conservation and management Glob. Change Biol., 21, 997–1004

171. Lansing, J. S., and Miller, J. (2005) Cooperation, games, and ecological feedback: Some insights from Bali. Current Anthropology, 46(2), 328–334.

172. Lansing, J. S., and Miller, J. (2005) Cooperation, games, and ecological feedback: Some insights from Bali. Current Anthropology, 46(2), 328–334.

173. Bicchieri, C. (2016) Norms in the wild: How to diagnose, measure, and change social norms. Oxford University Press.

174. Henrich, J., et al. (2005). “Economic man” in cross-cultural perspective: Behavioral experiments in 15 small-scale societies. Behavioral and Brain Sciences, 28(6), 795–815.

175. Nyborg, K., et al. (2016) Social norms as solutions. Science, 354 (6308), 42–43.

176. Granovetter, M. (1978) Threshold models of collective behavior. American Journal of Sociology, 83(6), 1420–1443.

177. Thulin, E. (2020) Cooperative behavior adoption guide: Applying behavior-centered design to solve cooperative problems. Rare.

178. Ashraf, S., et al. (2020) Design and rationale of the Longitudinal Evaluation of Norms and Networks Study (LENNS): A cluster-randomized trial assessing the impact of a norms-centric intervention on exclusive toilet use and maintenance in peri-urban communities of Tamil Nadu. MedRxiv, 2020.06.26.20140830.; Evans, W. D., Donahue, C., Snider, J., Bedri, N., Elhussein, T. A., and Elamin, S. A. (2019) The Saleema initiative in Sudan to abandon female genital mutilation: Outcomes and dose response effects. PLOS ONE, 14(3).

179. Glowacki, L., & von Rueden, C. (2015). Leadership solves collective action problems in small-scale societies. Philosophical Transactions of the Royal Society B: Biological Sciences, 370, 20150010.; Warren, C. (2016). Leadership, social capital and coastal community resource governance: The case of the destructive seaweed harvest in West Bali. Human Ecology, 44, 329–339.; Stein, C., Ernstson, H., & Barron, J. (2011). A social network approach to analyzing water governance: The case of the Mkindo catchment, Tanzania. Physics and Chemistry of the Earth, Parts A/B/C, 36, 1085–1092.

180. Laitos, R., et.al.(1986). Rapid Appraisal of Irrigation Systems in Nepal, Water Synthesis Project, Colorado University. USAID.

181. Garcia-Barrio, R. and Garcia-Barrios, L. (1990). Environmental and technological degradation in peasant agriculture: A consequence of development in Mexico. World Development, Elsevier, 18(11),1569-1585.

182. Menzies, N. (1994). Forest and Land Management in Imperial China. Basingstoke: Macmillan; New York: St Martin's Press. 175 pp.

183. Shanmugaratnam, N., Vedeld, T., Mossige, A., and Bovin, M. (1992). Resource Management and Pastoral Institution Building in the West African Sahel. WorldBank Discussion Papers, Africa Technical Department Series 175, Washington D.C.

184. McKean, Margaret A. (1986). Management of Traditional Common Lands in Japan. Proceedings, pp. 533-589.

185. Baland, J.M. and J.P. Platteau (1999) The Ambiguous Impact of Inequality on Local Resource Management, World Development, 27 (5), 773-88.

186. CGIAR Program on Collective Action and Property Rights (CAPRi). (2010) Collective action and property rights for sustainable development. In Resources, rights, and cooperation: A sourcebook on property rights and collective action for sustainable development, CGIAR Program on Collective Action and Property Rights (CAPRi). Fundamentals of Collective Action and Property Right, Chapter 1, Pp. 3-8. Washington, DC: International Food Policy Research Institute (IFPRI). https://ebrary.ifpri.org/digital/collection/p15738coll2/id/133871

187. Ostrom, E., Gardner, R., and Walker, J. (1994) Rules, Games, and Common-pool Resources (E. Ostrom, R. Gardner, & J. Walker (eds.)). Ann Arbor: University of Michigan Press.

188. Basurto, Xavier. (2005) How Locally Designed Access and Use Controls Can Prevent the Tragedy of the Commons in a Mexican Small-Scale Fishing Community. Society and Natural Resources, 18.

189. Bicchieri, C., Dimant, E., and Sonderegger, S. (2020) It's not a lie if you believe the norm does not apply: Conditional norm-following with strategic beliefs. Working Paper Available at SSRN: https://dx.doi.org/10.2139/ssrn.3326146.;Prentice, D., and Paluck, E.L. (2020). Engineering social change using social norms: Lessons from the study of collective action. Current Opinion in Psychology.

190. Chong, A. et. al. (2015) (Ineffective) Messages to Encourage Recycling: Evidence from a Randomized Evaluation in Peru, The World Bank Economic Review, Volume 29, Issue 1, 180–206.; Bernstad, A. (2014) Household food waste separation behavior and the importance of convenience. Waste Manag., 34(7), 1317-23.

191. Chhatre, A. and Agrawal, A. (2008) Forest commons and local enforcement. PNAS. 105 (36), 13286-1329.

192. Rare. 2018. Stemming the Tide of Coastal Overfishing Fish Forever Program Results 2012–2017 Full Report.

193. Gibson, C. C., Williams, J. T., and Ostrom, E. (2005) Local enforcement and better forests. World Development, 33(2), 273-284.; Persha, L., Agrawal, A., and Chhatre, A. (2011) Social and ecological synergy: local rulemaking, forest livelihoods, and biodiversity conservation. Science, 331(6024), 1606-1608.

194. Blake, J. (1999) Overcoming the 'value-action gap' in environmental policy: Tensions between national policy and local experience. Local Environment, 4(3), 257–278.

195. Kennedy, E. H., Beckley, T. M., McFarlane, B. L., and Nadeau, S. (2009). Why We Don't "Walk the Talk": Understanding the Environmental Values/Behaviour Gap in Canada. Human Ecology Review, 16(2), 151–160; Young, W., Hwang, K., McDonald, S., and Oates, C. J. (2010) Sustainable consumption: Green consumer behavior when purchasing products. Sustainable Development, 18(1), 20–31.

196. Ebeling, F. and Lotz, S. (2015). Domestic uptake of green energy promoted by opt-out tariffs. Nature Climate Change, 5(9), 868–871.; Brown, Z., Johnstone, N., Haščič, I., Vong, L., and Barascud, F. (2013) Testing the effect of defaults on the thermostat settings of OECD employees. Energy Economics, 39, 128–134; Chakravarty, S., and Mishra, R. (2019). Using social norms to reduce paper waste: Results from a field experiment in the Indian Information Technology sector. Ecological Economics, 164, 106356.

197. https://behavior.rare.org/design/

198. Zafra-Calvo, et. al. (2019) Progress toward equitably managed protected areas in Aichi Target 11: A global survey. Bioscience, 69, 191– 197.

199. Cetas, E.R. and Yasue, M. (2016) A systematic review of motivational values and 364 conservation success in and around protected areas. Conserv. Biol. 31(1), 203–212.; Klein, C., et al. (2015) Social equity and the probability of success of biodiversity 420 conservation. Glob. Environ. Change, 35, 299-306.

200. Zafra-Calvo, et. al. (2019) Progress toward equitably managed protected areas in Aichi Target 11: A global survey. Bioscience, 69, 191– 197.

201. Thulin, E. (2020) Cooperative Behavior Adoption Guide: Applying Behavior-Centered Design to Solve Cooperative Dilemmas. Arlington, VA: Rare.

202. https://rare.org/program/lands-for-life/

203. Bujold, P. M., Williamson, K., and Thulin, E. (2020) The Science of Changing Behavior for Environmental Outcomes: A Literature Review. Rare Center for Behavior & the Environment and the Scientific and Technical Advisory Panel to the Global Environment Facility.

204. Trimble, M. and Johnson, D. (2013). Artisanal fishing as an undesirable way of life? The implications for governance of fishers' well being aspirations in coastal Uruguay and southeastern Brazil. Marine Policy, 37(1), 37–44.; Santos, A.N. (2015) Fisheries as a way of life: Gendered livelihoods, identities and perspectives of artisanal fisheries in eastern Brazil. Marine Policy, 62, 279–288.; Harper, S., Grubb, C., Stiles, M. and Sumaila, U.R. (2017) Contributions by women to fisheries economies: Insights from five maritime countries. Coastal Management, 45(2), 91–106.

205. Pugel, K., Javernick-Will, A., and Linden, K. (2019) What is a collective action approach and what makes it effective? - a desk review.

206. Duraiappah A. et. al. (2013) Managing biodiversity is about people. Pages 27–31 in: Ecology and economy for sustainable society. Presented at the Seventeenth Trondheim conference on biodiversity, subsidiary body on scientific technical and technological advice. Convention on Biological 385 Diversity (CBD) Information Paper SBSSTA 18.

207. Pathways to Establishing Managed Access and Networks of Reserves – Rare. https://rare.org/report/pathways-to-establishing-managed-access-and-networks-of-reserves/

208. Ostrom, E. (1990) Governing the Commons: The Political Economy of Institutions and Decisions, Cambridge University Press, Cambridge.

209. Ostrom, E. (1990) Governing the Commons: The Political Economy of Institutions and Decisions, Cambridge University Press, Cambridge.

210. United Nations Development Programme. (2012) The Power of Local Action: Lessons from 10 Years of the Equator Prize. New York, NY: UNDP.

211. McKean, M. A. (2000) Common property: What is it, what is it good for, and what makes it work? In C. Gibson, M. Mckean, and E. Ostrom (Eds.), People and Forests: Communities, Institutions and Governments. Cambridge, MA: MIT Press.; Berkes, F., Feeny, D., McKay, B., & Acheson, J. (1989). The benefits of the commons. Nature, 340, 91–93.; Kothari, A., Corrigan, C., Jonas, H., Neumann, A., and Shrumm, H. (2012). Recognizing and Supporting Territories and Areas Conserved by Indigenous People and Local Communities: Global overview and national case studies. Montreal, Canada.

212. Fa, J. E., et al. (2020). Importance of Indigenous Peoples' Lands for the Conservation of Intact Forest Landscapes. Frontiers in Ecology and the Environment, 18(3), 135–140.; Frechette, A., Ginsburg, C., & Walker, W. (2018). Toward a Global Baseline of Carbon Storage in Collective Lands: Indigenous Peoples' and local communities' contributions to climate change mitigation. Washington, DC. Retrieved from https://rightsandresources.org/wp-content/uploads/2018/09/A-Global-Baseline_RRI_Sept-2018.pdf.; Walker, W. S., et al. (2020) The role of forest conversion, degradation, and disturbance in the carbon dynamics of Amazon indigenous territories and protected areas. Proceedings of the National Academy of Science, 117, 3015–3025.

213. Rare. 2018. Stemming the Tide of Coastal Overfishing Fish Forever Program Results 2012–2017 Full Report.

214. Rare. 2018. Stemming the Tide of Coastal Overfishing Fish Forever Program Results 2012–2017 Full Report.

215. United Nations Development Programme. 2012. The Power of Local Action: Lessons from 10 Years of the Equator Prize. New York, NY: UNDP.

216. Acheson, J. (2006) Institutional Failure in Resource Management. Annual Review of Anthropology, 35, 117-134

217. Mascia, M. B., & Mills, M. (2018). When conservation goes viral: The diffusion of innovative biodiversity conservation policies and practices. Conservation Letters, 11, e12442.

Rare inspires change so people and nature thrive.

Conservation ultimately comes down to people—their behaviors toward nature, their beliefs about its value, and their ability to protect it without sacrificing basic life needs. And so, conservationists must become as skilled in social change as in science; as committed to community-based solutions as national and international policymaking.

Rare is a global leader in catalyzing behavior change to achieve enduring results. For 50 years, inspiring change has been woven into the fabric of our work. This is what makes us Rare.

Learn more at rare.org and follow us at @Rare_org.