Farming for Biodiversity

Feeding Local Solutions into Global Policy

Final Report

Photo Credit: Jason Houston for Rare

rare

IFOAM ORGANICS INTERNATIONAL

Convention on Biological Diversity

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Editing and Design

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Foreword

Biodiversity and ecosystem services directly link to human and ecological well-being, livelihoods, and food security. Globally, biodiverse landscapes enhance the resilience of communities to climate change and provide for greater food sovereignty. Yet, agriculture, forestry and other land use practices are associated with all five primary threats to biodiversity, as identified in the 5th Global Biodiversity Outlook report and contribute about 23% of current greenhouse gas emissions annually. A transformative, systemic shift is needed to align agricultural production with the functionality and sustainable productivity of healthy ecosystems and empower small scale farmers to be change makers in that process.

Undeniably, changing the trajectory of our productive systems requires bold policies as well as investments from both governments and the private sector. Yet, an often overlooked, but critical, component is to work with the farmers directly to shift not only their individual farming practice but also social norms around more suitable use of the natural resources they depend on. Focusing on specific behaviors tied to farming allows us to leave behind the silos we tend to work in and to move from individual to collective action while approaching land use from an integrated ecosystem—rather than a sectoral perspective as foreseen by the UN Sustainable Development Goals.

Food systems and farms are a fantastic entry point for transformation of productive systems, and behavioral insights are what 'makes it stick'. On the farm level, a human-centric, nature-based approach is needed for sustainable change. This means to better understand the emotions, knowledge, attitudes, and norms tied to agricultural practices. This is by no means a one-sided process but an opportunity to 'localize' high-level development agendas, integrate indigenous knowledge and create agency in local producers and consumers. Early adopters and champions in this process will then become the linchpins for scale.

To move from individual to collective change, it is essential to empower and shine a light on people within a community that are early adopters of prioritized practices. Once individual behavior change begins to take place, community members need both empirical and social proof—in other words, "what works?" and "what are others in my community doing?", to start to see and understand the benefits of new practices. Gradually, the collective imagination registers clear, positive referents. This changes expectations and improves willingness to support collective action and creates enough social momentum that even those who are more resistant to change start to accept a new norm.

With financial support from the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) through the International Climate Initiative (IKI), the Farming for biodiversity project launched a global "Solution Search" contest, designed to identify, celebrate and help replicate community-driven solutions from around the world. Overall, 338 solutions that increase biodiversity within agricultural production were unearthed. Following the Solution Search, Rare and IFOAM led Campaigning for Conservation (C4C) training workshops with select contest entrants from over 11 countries. Guided by social and psychological sciences for conservation and community engagement, participants received the soft and hard skills needed to replicate and scale their unique solutions. Based on these trainings, campaigners implemented a total of 38 behavior change campaigns, accelerating the uptake of biodiversity friendly farming practices among thousands of producers and consumers globally, supporting the transition towards biodiversity-friendly agriculture and agroecology. Combined, these campaigns directly reached ~43,000 farmers and ranchers as well as over 570,000 community members globally.

In this context, the Farming for Biodiversity project is a beacon that has put a spotlight on over 300 tangible solutions to biodiversity challenges in smallholder farming. The initiative demonstrated that cause and the solution to sustainability challenges resides in human behavior, and the pathway to behavior change at scale across the globe. This will be a critical consideration for parties as they set out develop the post-2020 Global Biodiversity Framework during this year's 15th UN CBD Conference of the Parties. This report is a great opportunity to learn more about the solutions and individual solution provides and shares insights and best practice. It is in this spirit that we look forward to integrating the systems approach described by the Farming for Biodiversity initiative into our Lands for Life programme and continue our efforts to replicate and scale locally-led, nature-based solutions through Behavior Change.

Paula Caballero
Managing Director, Lands for Life, Rare

Executive Summary

The Farming for Biodiversity Solution Search contest was a bold experiment to solicit community solutions for aligning biodiversity preservation and agricultural production. Using a crowd-sourced format, the contest attracted 338 submissions from 86 countries. From the largely untested to the highly researched, their solutions focused on applying promising practices to benefit both agricultural communities and the environments they call home. The approaches and achievements underscored the broadly held understanding that farming and biodiversity are not mutually exclusive, but rather can, and must, be self-reinforcing. Moreover, they showed concrete ways in which small projects around the world already are translating international goals and guidance for sustainable development into actual practice.

Since the contest in 2017, awareness of the importance of preserving the world's biodiversity has grown, and eco-friendly approaches are on rise, both in the way we produce our food and how we consume it. Further evidence has emerged to back the argument that the preservation of natural resources makes financial sense, too, generating nine dollars of economic benefits for every one dollar invested.

However, to reap those potential benefits, the funding and support to protect precious ecosystems and their biodiversity must reach down to the community level. They should be designed in such a way as to recognize that the actions of small-scale farming communities are as critical to our global community as are larger-scale strategies, and offer local-level proponents the resources they need to replicate and take their solutions to scale.

The Farming for Biodiversity Solution Search Contest demonstrated how even small investments in community-level solutions could lead to sizable payoffs, not only for participants and their programs but also more broadly. Nine of the leading projects from the contest were chosen to host Campaigning for Conservation (C4C) workshops with participants from a total of 38 different organizations representing 12 countries. The workshops combined Rare's C4C methodology, which teaches participants how to design and implement a social marketing campaign aimed at changing unsustainable practices, with training on the techniques and marketing of organic agriculture, led by IFOAM Organics International.

The C4C experience and campaigns reached 227 trainees, 43,000 target audience members, and more than 570,000 members of the wider community. They resulted in greater self-efficacy among participants, along with a new arsenal of skills, to build a new cadre of change movement leaders. Their ripple effects not only led to better land management

and healthier ecosystems. They also created such outcomes as greater community engagement, increased inclusion of women and youth, stronger social cohesion, improved livelihoods and livelihood options, and renewed valuation of indigenous people and resources.

The core of the C4C training's effectiveness lies in its grounding in behavioral science, and the recognition that human behaviors are at the heart of both the threats to biodiversity and the solutions aimed at alleviating them. The tools and products of the workshops work within the social connections and influences that affect human behaviors, and offer ways to motivate change, make it easy, and ingrain it as the new option of choice.

Taken to scale, behavior changes and community-based solutions for reconciling farming production and biodiversity preservation can make a profound difference. They can help spur a transformation of food and land use systems that can strengthen rural economies, making them more inclusive and food secure, while also bringing our world closer to achieving its broader Sustainable Development Goals, the post-2020 UN Global Biodiversity Framework and Climate Agreement targets.

The pages of this report describe how small community-based and led campaigns are leveraging our human connections and the lessons of behavioral change science to align the course of farming and biodiversity for their benefit, and for ours. They demonstrate the force of bottom-up solutions, and the vital synergies between local action and global objectives. They offer hope and tangible recommendations for how different stakeholders—from high-level donors and policymakers to businesses, investors, researchers, consumers, and communities themselves—can support small-scale solutions, and their wide-scale potentials.

Table of Contents

Why We Need Farming *and* Biodiversity: A Necessary and Self-reinforcing Alliance

Human existence depends on biodiversity and the rich array of traits within the world's plants, animals, and organisms. Without them we could not grow the food we need, maintain vital water supplies, or shape our ability to confront the course of a changing climate. However, harmful human practices are endangering our natural environments and driving biodiversity to the brink, including in our agricultural ecosystems. Poor land use and water management are often to blame, as are practices such as the overexploitation of natural resources, unabated pollution, and overreliance on chemical fertilizers and pesticides. The intensification of agricultural production, which relies on a very small pool of dominant crops and livestock, is further eroding genetic stocks and decreasing the arsenal of diverse varieties on which we rely in the face of climate change or threats, such as new pests and diseases.[1,2]

At the same time, the awareness of the importance of preserving the world's treasure trove of biodiversity is growing, too. Biodiversity-friendly approaches are on the rise worldwide, both in the way we produce food and how we consume it.[3] Agroecological approaches and regenerative farming practices are gaining footholds—as are more sustainable systems for forest management, agroforestry, aquaculture, and fisheries. Consumer demand for goods that are organically grown, sustainably sourced, wildlife friendly, and fair-trade also is on the rise, as buyers vote with their pocketbooks and shift their spending habits away from unsustainable brands.[4]

Further economic calculations are coming down on the side of biodiversity preservation, too, backing the argument that sustainable agriculture can feed more people and protect the ecosystems that harbor precious biological diversity, while also improving the livelihoods of rural communities.[5] The World Economic Forum estimates that each dollar spent restoring natural resources generates at least nine dollars in economic benefits. Moreover, it finds that the adoption of eco-friendly agricultural and food production methods could generate new business opportunities worth $4.5 trillion per year by 2030, along with trillions more dollars in cost savings from social and environmental harms.[6,7] The transformation of food and land use systems within the next decade could strengthen rural economies to make them more inclusive and food secure, while also bringing our world closer to achieving its broader Sustainable Development Goals, the post-2020 Global Biodiversity Framework, and Climate Agreement targets.[8]

Why Empowering Local Change Makers Matters

The world has everything to gain from the use of sustainable farming practices, but we cannot begin to meet our global and national objectives for preserving biodiversity without investing in the community-level solutions that undergird much of the needed change in our agricultural production systems. Small-scale farming and fishing communities produce most of the world's food and have the greatest stake in finding ways to ensure that farming and biodiversity are self-reinforcing and not at odds with each other.[9,10] They are on the front lines of climate change and coping with its effects on their lives, living conditions, and livelihoods. Rather than passively accepting defeat, many communities are applying sustainable solutions, taking on the mantle of biodiversity guardianship to benefit both their agricultural productivity and the resilience of their natural environments.

The Solution Search contest brought forth concrete examples of the ways in which local communities are demonstrating how to translate national or international sustainable development goals into actual practice. Communities are adopting mixed farming systems—combining multiple crops, livestock, and trees to maximize both their land's biodiversity and its productivity. Initiatives are tapping into the expanding demand for organic and bio-friendly products, connecting farmers to markets that offer more lucrative returns for greater environmental stewardship. Programs are offering alternatives to harmful practices, such as poor waste management or the overuse of chemical fertilizers and pesticides, and demonstrating ways to better support vital native habitats and resources. They are working with local governments, schools, and organizations to form the next generation of biodiversity champions and to institutionalize conservation activities within policies that also support food production, economic growth, and social betterment.

Communities are finding solutions and are important drivers of change. But if we do not recognize their role, if we do not empower the local solutions and their leaders, many of the strategies, lessons learned, and practical applications they have tested and revised will be lost. The solutions highlighted in the Farming for Biodiversity contest were small in scale and in budget, but their contributions have wide significance and display the beginning of a pathway towards sustainable and biodiversity-friendly food systems. They need to be part of our global and national investments, funding streams, and acknowledgments. Moreover, the sustainable management of local resources cannot be realized without a devolution of decision-making and management, responsibility, and benefits to those leading the change and ensuring that it is maintained.[11] Proper funding, technical support, and recognition can thus build on the strength of community interconnectedness, agency, and identity to ensure the resilience of locally-driven initiatives and the landscapes they are working to preserve.

What Works? Soliciting Community Solutions

The 2017 Farming for Biodiversity Solution Search was a bold experiment. Using a crowd-sourced contest that drew 338 submissions from 86 countries, it provided a compelling tableau of the vast range and promises of community-based initiatives working to align biodiversity preservation with agricultural production. From the largely untested to the highly researched, the solutions focused on applying best practices, whether rooted in tradition or embracing new technology and ways of doing, to benefit both agricultural communities and the environment they call home.

The Solution Search strategies addressed different drivers of biodiversity loss by promoting more sustainable management of land, water, forests, pests, and livestock. They recognized key socio-economic dynamics, such as the need to improve or diversify local livelihoods, or to give voice to groups that often go unheard. Activities were designed to meet people within their different cultural contexts. They leaned on pride of place and heritage, but also pushed traditional boundaries to introduce new attitudes and offer new options—particularly for youth, women, the elderly, or indigenous communities.

For all their promise, the community initiatives solicited by the contest continue to face challenges when it comes to strengthening the impacts of their activities within their own localities and beyond. While they hold the keys to new ways of doing that could also be applied elsewhere, they lack the tools to replicate and take those solutions to scale. Fortunately, small investments in their capacity development can go a long way toward spreading their successes and bolstering their capacities as change makers. Such funding must be integrated into trickle-down planning and spending, however, and reach the local level entities that are turning potential solutions into active practice.[12,13,14]

The Farming for Biodiversity contest confirmed that community responses to the challenges of climate change and environmental threats are happening already. What we must recognize is that the actions of small-scale farming communities are as critical to our global community as are larger-scale strategies in ensuring our future resilience. As noted by the IUCN Species Survival Commission, we just need to support more of them.

> **“Many conservation actions have shown that we can reverse the trend of biodiversity loss. From in situ and ex situ species recovery programmes, the establishment of protected areas and control of invasive species, to sustainable use, behavior change, and many other possibilities. We just need to do more of it.”**
>
> **- IUCN Species Survival Commission[15]**

Why Behavior Change Matters

Human behaviors are at the heart of biodiversity threats. Thus, reversing the loss of precious genetic resources means that we must start behaving differently—individually and collectively—as producers, consumers, influencers, and decision-makers. The Farming for Biodiversity contest elicited many examples of projects that are convincing communities to let go of unsustainable practices and adopt new ways of doing that foster healthier ecosystems. For example, one area of focus was improved forestry management, recognizing that 80 percent of wood harvested in the tropics is used for firewood and charcoal, contributing to both deforestation and carbon emissions. Projects proposed alternative ways of using forested lands, generating income, and feeding cookstoves that not only save biodiversity resources but also allow local stakeholders to experience the direct results of their improved environmental stewardship.

The human practices that harm biodiversity may reflect long-standing practices or expectations, but they are not hard-wired into our DNA. We are adaptable beings, embedded in social networks and influences that affect our actions and choices deeply. Changing behaviors requires meeting people where they are, socially, culturally, geographically, and also in terms of readiness to embrace new ways of thinking and behaving. It depends on an ability to understand the barriers that may stand in the way of change, particularly in communities where livelihoods are precarious and members do not control all the factors (e.g., land use policies, access to technology or financing) that impact their ability to adopt more eco-friendly practices.

Promoting behavior change may rely on a range of incentives and entry points to help people switch gears and make sustainable practices the *de facto* preference. Creating an enabling environment for change may include material or financial incentives, supportive government policies, or easier access to needed resources. They may entail the empowerment of existing and potential change leaders, through activities such as those that recognize women's contributions, embrace inclusivity, celebrate the keepers of traditional knowledge, engage children and young people, or reach out to faith leaders. They may address biodiversity preservation directly, through actions to preserve habitats or species, or by addressing indirect influences through changes in consumption habits, public policies, and social norms.

As Rare has demonstrated based on behavioral science evidence, conventional ways of promoting change using incentives, information campaigns, and regulations may be helpful, but are not sufficient to fully target the social and material influences that shape our behavioral choices.[16] Thus, we need tools and approaches that not only help *motivate the change*, by harnessing the right incentives, emotions, and subjective perceptions, but also *socialize the change*, leveraging the deeply social nature of what guides and influences our behavior. Moreover, they also need to help *ease the change*, by removing barriers, taking advantage of timely moments, and putting in the supports that switch the preferred ways of doing to become the default option rather than the exception.[17]

Replicating and Scaling Up Solutions

The Farming for Biodiversity Solution Search contest identified many projects with promising potential for expansion and replication in other localities. Six official winners, chosen by a global jury and the general public, received prize money, practical support for going to scale, and formal recognition on the global stage and at the sidelines of the UN Framework Convention on Climate Change 23rd Conference of the Parties (UNFCCC COP 23) in Bonn, Germany. Nine of the top contenders were selected to host a series of Campaigning for Conservation (C4C) training workshops designed to enable local champions to enhance and replicate their approaches and to create community campaigns to promote them.

The workshops combined two approaches:

1. Rare's C4C methodology, which teaches participants how to create and implement a social marketing campaign aimed at catalyzing behavior change around unsustainable behaviors.
2. Training on the techniques and benefits of organic agriculture, led by IFOAM Organics International.

To help further scale up the lessons and outputs of the workshops, 38 partner projects from 12 different countries joined in the trainings and were invited to create their own spin-off community campaigns to promote additional, proven agricultural solutions.

The workshops were intensive, immersive, and highly interactive. Each session included participatory classroom instruction on social behavior change tools; including the concepts of behavior change, development of a targeted theory of change, SMART objectives, social marketing tactics, qualitative and quantitative research techniques, and effective campaign design. Two days were devoted to field research, with participants interviewing local farmers and conducting surveys to fully comprehend their concerns and considerations, including key barriers or motivators that would affect their likelihood of adopting desired changes in their behaviors and practices. Another field day was devoted to the IFOAM training on organic agricultural production and certification, including its integration within broader ecological, economic, and socio-cultural frameworks and networks. Finally, participants worked as teams over several more days to produce and validate (with local children and community members) a full range of campaign materials. Examples included everything from the choice of a slogan and key messages to design features for such articles as a public mural, billboard, discussion board, comic book, poster, puppet show, song, or words for a sermon connecting campaign messages with scripture.

Tailoring the Message to Foster Understanding and Uptake

The C4C trainings culminated in the creation, testing, and application of compelling campaign materials meant to help create new social norms and behaviors. They targeted both a primary audience of people involved in unsustainable behaviors and a broader secondary audience of children, community members, and other stakeholders. The materials included products and activities that can be developed quickly, locally, and at minimal cost. The formats and designs reflected local traditions and cultural mores, and conveyed messages that were easy to understand, retain, and translate into action.

Slogan

Building on pride and emotion, slogans are meant to capture the essence of what the campaign is all about in a short, catchy way.

Posters/Billboard/Mural/Song/Play

These materials are designed to be culturally relevant and to build awareness, spur discussion, and generate engagement They are meant to inspire the adoption of sustainable behaviors as the new default options.

Puppet Show and Comic Book

Children are tomorrow's leaders and also today's messengers for generating inter-generational discussion and behavior change. Materials targeting children convey the how's, why's, and benefits of behavior change in ways that are relatable to everyone and touch on adults' aspirations for their childrens' futures.

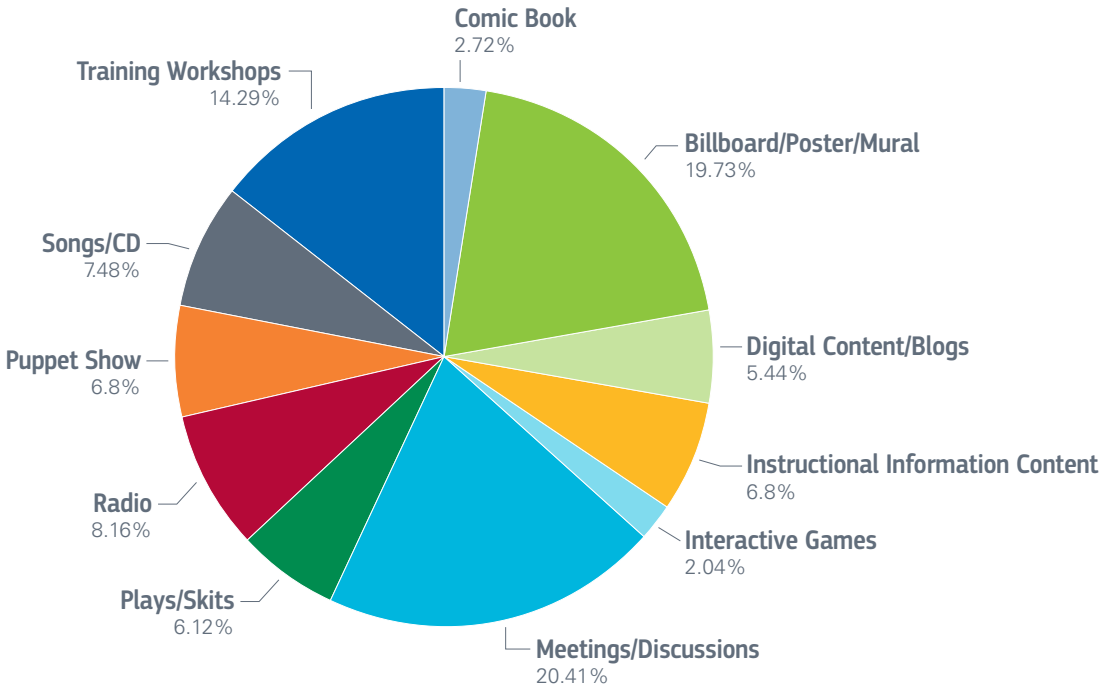
Discussion Board

Designed to get people talking, the discussion boards feature a "before" and "after" depiction illustrating what the new behavior can mean and produce. The point is to help validate new ways of doing among peers.

Sermon

Religious leaders are key influencers and can be powerful motivators if they speak about a campaign during a service, or praise/ bless its actions. Sermon sheets integrate campaign and behavior change messages within scripture and spiritual lessons.

Tools Utilized by Campaigns



Based on the experience, the partner organizations were invited to apply for small grants, which they were able to use to create their own C4C campaigns in their respective countries and regions. Through the ripple effects of the trainings and partner campaigns, the sustainable behavior change messages and tactics spread far beyond the original workshop trainees. Globally, the local campaigns directly reached 43,000 audience members—including farmers, youth, women, and indigenous communities, who were directly targeted to adopt new ideas, practices, and ways of doing. In addition, their influence spread to reach more than 570,000 wider community members, who were reached through different campaign events and represent an important part of the creation of a supportive environment for change.

The workshops also had profound effects on the trainees themselves. Beyond building their practical skills and experience in working directly with communities, employing organic techniques and marketing, and understanding the dynamics of behavior change, the sessions empowered participants in a whole new way. They taught them to listen and collect insights from local communities, not only to shape campaign activities but also to open their own minds to different perspectives, sources of learning, and ways of framing problems and solutions. The workshops were motivating, career enhancing, and starting points for new connections and networks among the participants. The engagement with various stakeholders, and with each other, created powerful communities of practice among trainees and further honed their roles and recognition as change leaders.

As described by C4C training observer, Professor Adam Levine of Cornell University, who studies how people with diverse forms of knowledge work together to address social challenges, the workshops fostered greater self-efficacy and created new cohorts of leaders poised to build a change movement. "Rare focuses on cutting-edge applications of the psychology of behavior change," he explains. "I would argue that they're also at the cutting-edge of the psychology of relationship-building, and that's what's necessary for creating leaders who will then go persuade others to change their behavior. If you want to truly build a behavior change movement, these leaders are essential."

In Their Own Words: Creating Change Movement Leaders

Campaign participants described how the C4C training changed their lives, expanded their perspectives, and created a new, global community of practice for them.

"During the workshop, we had the opportunity to discuss and exchange ideas on topics that we handle from a different perspective. We have been incorporating the knowledge we obtained in the workshop in our activities, and we have noticed a change in the way we express ourselves to the producers, and the impact that we have had has been greater."

– Kevin Farrera, Mexico

"At [the COP], I was initially nervous and intimidated—I didn't know how/if coming from a small organization I could contribute. But slowly, throughout the week, I realized that we are all humans, concerned about similar environmental issues and that it's really important for decision-makers to hear about our experiences and practices at the local level."

– Daniela Borja, Ecuador

"I think that something much more valuable [than our initial expectations] emerged in each one of us, which was to reconnect with our deeper interests thanks to the experiences we have lived, confirming that we are in the correct road. In my case, I fully reinforced my interest in working with communities. For me, this was much more transcendental than my initial expectations, which were related to learning a new methodology of work."

– Consuelo Andrade, Bolivia

"The training energized me to work with the local community, which I hadn't thought to work with before. Before, I just thought about my work—my farmer's market, my rooftop garden, my women's group. Now, I want to replicate what I am doing in Kathmandu with rural farmers. I came back from the training, and event, and people started to look at me differently—with respect. Now they believe in me and what I am doing. This is a kind of behavior change."

– Bimala Acharya Dahal, Nepal

"The training and event changed me. At the COP meeting, I saw people sitting around a table, making decisions that will affect you directly. And I realized that if you don't take part in these decisions, then your challenges and ideas won't be implemented. [These experiences] reinforced my confidence in myself and my work. I came away very confident in understanding an audience and targeting a message. One thing I took away, is that to believe in something, you have to follow it through... I now know that I can do this—I can believe in me."

– Phidel Hazel, Kenya

Solution Search Launch Pads for C4C Campaigns

Nine organizations hosted the C4C trainings, which culminated in the development of their own behavior change campaigns. Based on the training and experience, 38 participating organizations then produced their own campaigns.

Actions Pour l'Environnement et le Developpement Durable

Benin

Training Date:

April 2019

Solution:

Making compost from the invasive water hyacinth plant, improving local lake systems and farmers' yields through more sustainable fertilization.

Primary Threats to Biodiversity:

- Invasive alien species

Underlying Threats to Biodiversity:

- Social pressures
- Lack of awareness/knowledge

Campaign Slogan:

"Water hyacinth compost, the best fertilizer."

CAMPAIGNS

Serge Balley

Act for Development

Intended behavior change/solution:

Community farmers shift from non-sustainble farming practices to organic farming. Families increase profit and become community leaders.

Imaranth Adeoti

CREDEL

Intended behavior change/solution:

Farmers shift to organic and environmentally friendly methods (compost,mulch, chicken droppings). Quality of the coastal lagoon is improved.

Joie Sossoukpe

Aguegues

Intended behavior change/solution:

Community fishers shift from the use of wood made sedentary fisheries to the use of red mangroves as spawing areas. Fishers and women restore mangrove population.

Mikhail Padonou

ECO-Benin

Intended behavior change/solution:

Improve feelings/ attitudes towards mangroves. Community women adopt eritrean-type fireplaces that consume less wood, therfore their livelihoods and the environment is improved.

Edgard Kingissode

CIDEV

Intended behavior change/solution:

Hunters uptake organic farming as a source of subsistence.

Junior Ohouko

ODDB_ONG

Intended behavior change/solution:

Development of aulacodiculture (aulacode farming), as a substitute for bushmeat from threatened animal species in the community forest Gnanhouizoun.

Desarrollo Alternativo e Investigacion (DAI)

Bolivia

Training Date:

June 2018

Solution:

Moving communities from conventional farming systems towards agroecological ones, revitalizing traditional crops and systems using local maize and bean seeds—and incentivizing the establishment of enterprises that invest in agrobiodiversity.

Primary Threats to Biodiversity:

- Habitat loss and deforestation

Underlying Threats to Biodiversity:

- Loss of traditional utilization of native species
- Lack of awareness/knowledge
- Poor/unsustainable farming practices

Campaign Slogan:

"Modernizing agriculture—with old wisdom and traditional seeds."

CAMPAIGNS

Marioly Cespedes Zardan

DAI Bolivia

Intended behavior change/solution:

Community adopts agroecological practices and participates in biodiversifying their crops.

Mauricio Sanchez

DAI Bolivia

Intended behavior change/solution:

Community adopts agroecological practices and participates in biodiversifying their crops.

Consuelo Andrade Hanke

Descubriendo-Rio Crochane, Chile

Intended behavior change/solution:

Community adopts organic farming to their practice and reduces the amount of chemicals used in their foods.

Stephanie Kaylene Mladinich

Legado Mozambique

Intended behavior change/solution:

Communities implement sustainable agricultural techniques and become advocates for the forest as source of water purification for farms.This results in improved ecosystem function for Ribaue Mountain.

Canopy Bridge EcoDecision

Ecuador

Training Date:

June 2018

Solution:

Using gastronomy as an agent of change by connecting indigenous producers of specialty ingredients with leading chefs and restaurants.

Primary Threats to Biodiversity:

- Invasive alien species
- Habitat loss

Underlying Threats to Biodiversity:

- Social pressures
- Loss of traditional utilization of native species

Campaign Slogan:

"My [traditional] farmland is wealth, culture, and life, that's why my farmland is worth it."

CAMPAIGNS

Daniela Borja

Red de Semillas Ancentrales

Intended behavior change/solution:

Female Quito workers and store owners become advocates for ancestrial seeds and encourage their production by selling more.

Estefania Baldeon

Canopy Bridge

Intended behavior change/solution:

Farmers increase collaboration and communication to improve trade of organic markets, attend and collaborate in workshop.

Apis Agribusiness

Ethiopia

Training Date:

November 2018

Solution:

By training unemployed and landless rural youth in organic wild honey production, Apis Agribusiness not only creates income opportunities linked to the growing market in sustainable honey—the initiative also sets strong incentives for protecting the forests where wild bees live.

Primary Threats to Biodiversity:

- Habitat loss and deforestation
- Unsustainable overexploitation of natural resources

Underlying Threats to Biodiversity:

- Social pressures
- Lack of awareness/knowledge
- Poor unsustainable farming

Campaign Slogan:

"No bees, no trees—no honey, no money."

CAMPAIGNS

Nasir Haji

Oromia Forestry & Wildlife

Intended behavior change/solution:

Farmers adopt Transitional BeeHives Production Activities In Forest Areas.

Rabiu Nasir

Oromia Forest Agency

Intended behavior change/solution:

Adoption of small scale irrigation to improve the existing cropping land productivities.

Abdella Mohammed

Ale District Rural Development Office

Intended behavior change/solution:

Farmers and youth uptake sustainable wood harvesting, bee keeping, and coffee practices.

Manor House Agricultural Centre

Kenya

Training Date:

March 2018

Solution:

Introducing biointensive agriculture to improve yields and sustainability. The methods reduce water consumption significantly, regenerate the soil and clean river flow, and strengthen food security—rebuilding a sense of community in the process.

Primary Threats to Biodiversity:

- Climate change
- Habitat loss
- Unsustainable overexploitation of natural resources

Underlying Threats to Biodiversity:

- Social pressures
- Lack of awareness
- Reliance on limited genetic pools for crop production

Campaign Slogan:

"Strengthen crops using conservation agriculture."

CAMPAIGNS

Phidel Hazel

YPARD

Intended behavior change/solution:

More youths engage in green jobs, youths believe that agricultural jobs can be lucrative.

Teresia Wairimu

Kenya Organic Agriculture Network (KOAN)

Intended behavior change/solution:

People in the community adopt a more organic diets.

Irene Musumba

Anglican Development Services

Intended behavior change/solution:

Farmers engage in agricultural conservation practives which are more lucrative than conventional practices. Farmers will engage in crop rotation and intercropping, permanent soil cover, soil and water conservation, and improved soil fertility practices.

Philip Kabiru

KIINI Sustainable Initiative

Intended behavior change/solution:

Community uptakes beekeeping as source of subsistence and harvest of forest wood decreases.

Vivian Nekesa

Kipsaina Crane & Wetland Conservation Group

Intended behavior change/solution:

People in the community adopt goat dairy farming and beekeeping as primary sources of income.

Desarrollo Alternativo e Investigacion (DAI)

Mexico

Training Date:

March 2018

Solution:

Rebuilding community cohesion through greater crop diversification using native seeds and improved soil/land management. Farmer families benefit from an enriched diets and a greater sense of autonomy in driving their food production.

Primary Threats to Biodiversity:

- Nutrient loading and pollution
- Habitat loss

Underlying Threats to Biodiversity:

- Underutilization of native species
- Reliance on limited genetic pools for crop production

Campaign Slogan:

"Our good agriculture, strengthen our culture."

CAMPAIGNS

Noe Martinez

Centro de investigacion y Servicios Profesionales (CIRSEP)

Intended behavior change/solution:

Community members using Milpa crop growing system increase the production of native biodiversity and soil fertility through native seed trade. The community is nutrionally benefitted.

Rufino Grajales

Independent

Intended behavior change/solution:

Youth farmers use more natural/ sustainable practices in agriculture.

Kevin Farrera

DAI Mexico and DAI Ibestic

Intended behavior change/solution:

Mexico: Community improves the quality of backyard agricultural production using agroecological solutions to increase agricultural biodiversity and improve community nutrition.

Ibestic: Community improves the quality of agricultural production using agroecological solutions to increase agricultural biodiversity using native seed exchange and improve community nutrition using native seed exchange.

National Disaster Risk Reduction Centre

Nepal

Training Date:

June 2018

Solution:

Working with 14,000 indigenous households to switch from shifting agriculture to climate-resilient land management. Besides improving soil biodiversity, erosion control, incomes, and food security, collaborations with local communities have reduced conflicts between indigenous groups by 70%.

Primary Threats to Biodiversity:

- Climate change
- Habitat loss and deforestation

Underlying Threats to Biodiversity:

- Social pressures
- Loss of traditional methods

Campaign Slogan:

"Zero Tillage Our Choice."

CAMPAIGNS

Bimala Dahal

Himalaya Organic

Intended behavior change/solution:

Community members adopt organic practices as a way of creating profit and exchange through participation in farmer markets.

Chetana Shahi and Ishwor Mallaa

WUAC Mugu

Intended behavior change/solution:

Adoption of organic, climate resilient cash crops (including how to select and farm climate resilient crops).

Bir Bahadur Hamal and Bishnu Khana

Integrated Social Development Center and Fine Smart Consultancy

Intended behavior change/solution:

Community adopts organic and environmentally friendly vegetables and cash crops (including production of organic manure and organic pesticides).

Subash Belbase

Youth Endeavour for Sustainable Agriculture (YES Agriculture)

Intended behavior change/solution:

Adoption of organic agricultural practice through the use of vermicompost manure and implementation of technology among all farming communities.

The Mountain Institute

Peru

Training Date:

November 2018

Solution:

Protecting grasslands and water resources with improved livestock and land management.

Primary Threats to Biodiversity:

- Climate change
- Unsustainable overexploitation of natural resources

Underlying Threats to Biodiversity:

- Loss of traditional methods
- Lack of awareness/knowledge
- Poor unsustainable farming

Campaign Slogan:

"Smart grazing is my people's pride."

CAMPAIGNS

Hacinto Jimenez

TANTA, Hacinto Jimenez

Intended behavior change/solution:

Communities formalize active discussions and planning of land & ranching management for the purpose of improving sustainability.

Rondan Vidal

TMI – Carania

Intended behavior change/solution:

Community members have pride in the protection of their water systems and uses sustainable water management techniques.

Olwer Huanca and Elmer Segura Jiménez

Nor Yauyos Cochas Landscape Reserve

Intended behavior change/solution:

Ranchers actively communicate and discuss ranching practices to better prepare for effects of climate change.

Doris Alicia Vásquez and Oscar Mauricio Cifuentes

TMI – Canchayllo

Intended behavior change/solution:

The entire ranching community is engaged and committed to sustainable water and land management using ancestral practices.

Margoth García Gómez and Mario Gonzalez

Conservation International Colombia

Intended behavior change/solution:

Ranchers, farmers, fishers diversify in practices to profit, allow soil recovery, and improve forest connectivity.

"A Growing Culture" Centre for Creativity and Sustainability

Vietnam

Training Date:

August 2018

Solution:

Introducing bio-beds for pig husbandry to mitigate waste runoff and create new income generation options through the sale of locally-available absorbent materials needed for the hog beds.

Primary Threats to Biodiversity:

- Nutrient loading and pollution

Underlying Threats to Biodiversity:

- Poor unsustainable farming
- Poor waste management
- Lack of awareness/knowledge

Campaign Slogan:

"Clean pig breeding, a bright future ahead."

CAMPAIGNS

Tuyet Nguyen Thi

Vietnam Technology Application and Organic Agriculture Development Institute

Intended behavior change/solution:

Farmers switch from traditional practice of raising pigs on cement floor to using biobeds. Animal and human health improves.

Đỗ Tiến Dũng

Hoa Xa

Intended behavior change/solution:

Farmers switch from traditional practice of raising pigs on cement floor to using biobeds. Livelihoods of community and environment improve.

Diep Nguyen Ngoc and Duong Le Binh

Hong Ha Commune

Intended behavior change/solution:

Farmers switch from traditional practice of raising pigs on cement floor to using biobeds. Farmers increase revenue while reducing pollution.

IUCN Threats Addressed in Campaigns

The C4C Campaigns have spanned 12 countries worldwide and are addressing nine of the critical threats to our planet's biodiversity, as identified by the International Union for Conservation of Nature (IUCN). See below for the number of campaigns by primary IUCN threat category.

2.2.1 Agriculture & Aquaculture / Annual Perinneal Non Timber Crops / Small-holder (Mixed Agro-forestry systems)

9.3.1 Agricultural & Forestry Effluents / Nutrient Loads

9.3.4 Agricultural & Forestry Effluents / Type Unknown / Unrecorded

2.3.2 Agriculture & Aquaculture / Livestock Farming & Rancing / Small-holder Grazing, Ranching, or Farming

5.3.1 Logging & Wood Harvesting / Intentional Use: Subsistinance / Small Scale

5.4.1 Biological Resource Use / Fishing & Harvesting Aquatic Resources

5.1.1 Biological Resource Use / Hunting & Collecting Terrestrial Animals

7.2.3 Abstraction of Water Management Use, Abstraction of Surface Water, Wetlands

9.3.2 Agricultural & Forestry Effluents / Soil Erosion, Sedimentation

Behavior Levers for Scaling Farming for Biodiversity

As humans, we are guided by an array of thoughts, emotions, connections, and influences such that the choices we make and behaviors we undertake are rarely based solely on rational reasoning. As a result, activities meant to help us rethink our approaches and adopt new behaviors need to address this full decision-making context. They need to see behavior change as the adoption of particular social ideas, services, or practices—and do so in terms that are realizable. For example, behavioral science research suggests that messages focused on actions that are achievable and specific are far more likely to be successful than broad pleas to save the planet or instructions that rely on long lists of facts. Likewise, messages of fear and doom may capture attention, but are not as effective as the promotion of positive alternatives when it comes to inducing people to adopt new behaviors and better ways of doing.[18,19]

Using evidence from behavioral science, Rare has developed a framework for behavior change with six different "levers" that can be "pulled" in multiple combinations to address the full range of biases and social systems that drive our behavioral choices. These levers reflect both the direct and more subtle ways that our feelings, social connections, and place in society help determine what we do and our willingness to try new alternatives.

The Rare Behavior Levers include conventional methods that have long been used to try to incite behavior change, including *information* sharing to raise awareness, *material incentives* to prompt the adoption of new ways of doing, or the application of new *rules or regulations* to shift behavioral choices. Additional levers address conscious and unconscious behavior drivers, tapping into both internal motives and external social forces that affect our behavioral choices. These levers harness the power of *emotional appeals* as well as our dependence on *social influences* or on following the lead of people we admire to impact our willingness to cooperate, conform, or change what we do. They also take into account the *choice architecture* in which we function, which is composed of the habits, routines, and biases that frame our decision-making context.

While the levers are quite distinct, they are also complementary, with important overlaps. To maximize the effectiveness of their appeals and activities, the C4C campaigns used the behavioral levers in combination, building synergies between them and establishing multiple entry points to spur action, engagement, and transformative change.

Emotional Appeals

This lever speaks to the heart, leaning on the strong motivational forces of emotion, pride, and how our actions make us feel. It helps make the connection with what people care about, leaning on messages that are personally relevant, relatable, and appealing. Because emotional impulses are strongly guided by social context, it is important to do the research and gather the data to understand the cultural, economic, and political pressures that drive emotions and elicit strong positive or negative responses.

Many of the C4C campaigns appealed to emotions—particularly to a sense of pride, responsibility, and community belonging—in their campaign slogans. In Peru, campaigns aimed at improving livestock management to protect the high-altitude grasslands from overgrazing appealed to local communities with the slogan, "Smart Grazing is My Peoples' Pride," which was featured in a campaign song as well as on campaign materials. The campaign also created a presentation in the form of a soap opera, to appeal emotionally to local farmers and communities directly with a storyline that was compelling, relatable, and dramatic. The first presentation of the campaign products and activities took place during a traditional event, called the Cultural Evenings of Tanta, which had been through a six-year hiatus. The relaunching of this favorite gathering, along with the materials and festivities, further elicited strong emotional reactions and connections from community members, young and old.

In Mexico, the slogan, "Our Agriculture Strengthens Our Culture" was chosen to convey pride in native crops and the rich diversity of traditional varieties that could enrich the diets of farmer families, while also giving them greater autonomy in determining what to plant. The outreach projects included participatory seed exchanges, which also led to greater exchanges of knowledge, experience, and ideas. There was a cooking fair, and a native varieties recipe book, created and distributed through a collaboration with students from the University of Arts and Science of Chiapas—further expanding the pride in and recognition of traditional crops. The emphasis on pride and ownership not only helped to build engagement in activities to better manage local land and value native crops, but also it brought a shared purpose to the direct and wider audiences of the campaign. The result has been to help build community cohesion around a common local heritage and its shared stewardship.

Similarly, campaigns coming out of the C4C training in Bolivia adopted slogans such as, "Modernizing Agriculture—With Old Wisdom and Traditional Seeds" or "Let's Plant What is Ours" also appealed to community pride and feelings of responsibility for native crop varieties. The programs are revitalizing the use of local maize and bean seeds as part of initiatives to move farmers from conventional agricultural systems to ones that protect and restore agroecology and biodiversity. Likewise, the slogan "Youth Build the Future" is shining a light on young people, and tapping their pride and aspirations, as part of another campaign in Mexico, directed at promoting the uptake of more sustainable agricultural practices.

Social Influences

Our behavioral choices are highly influenced by the people and social norms that surround us. Social pressures—whether positive or negative—and the people we look up to play a major role in determining our willingness to cooperate, conform, or change. Social influence levers aim to turn desired behaviors into social norms through engagement with the people we turn to for leadership, inspiration, or validation. They work to make the desired behavior visibly present through various media and public forums, and to make it become the socially and personally desirable alternative as people follow the lead of individuals they like or admire.

In Ethiopia, C4C campaigns featured a variety of respected leaders and social energizers are part of their approaches. Leaders from the District Government visited the trainings in person to emphasize their support for the campaigns and activities. The campaigns also developed sermon sheets for local clergy, to align the campaign messages and behavior change initiative with the perspectives of the faith community and its leaders. The CEO of Apis Agribusiness, which hosted the C4C training in Ethiopia as one of the Solution Search winners, is himself a dynamic community influencer. As an entrepreneur and person active in recruiting young people to take up organic beekeeping and farming methods that preserve local forest ecosystems, Jony Girma has the charisma and drive that engages others and encourages them to follow his example. A central part of his "pitch" is to describe examples of how many young farmers have been trained and taken up the recommended behaviors and activities of the program, and the ways

> **[The last day of the C4C training] provided us with the grand finale to all our efforts over the past two weeks. The puppet show was performed by our talented youngsters in front of an audience of school kids and their parents under the cool shades of a mango tree. And finally, our billboard was introduced at a strategic location in the watershed, where everyone traveling this route is set to pass by. All of us were amazed by the great passion with which community members took to our materials, culminating in a great dance-off to our campaign song 'Sunia Zotai, Hamru Rozai'—'Zero Tillage, Our Choice.' "**
>
> **– C4C Campaign, Nepal**

it has transformed their livelihoods and life options. To further strengthen the social acceptability and preference for recommended behaviors, the campaigns organized discussion forums, conversations with faith leaders, and disseminated farmer success stories through media and dramatic performances.

In Bolivia, program strategies featured local champions to serve as social influencers and encourage the uptake of best practices. As described by one of the campaign developers, "Legacy champions are elemental in the program strategy. In each community, we have champion community members or innovators." Campaign projects also set up Natural Resource Committees, who bring together ideas regarding best practices and look outwards to increase environmental awareness, advocate for forest preservation, and demonstrate their own implementation of sustainable farming techniques.

In Kenya, campaigns used barazas, which are public meetings held by a collective group of respected community leaders, as social influence levers to present their recommendations for taking up biodynamic agricultural practices and creating green jobs to employ young people. They also created sermons for local religious leaders and developed community communication boards to "normalize" the option of preferring sustainable farming practices to the more destructive applications of monocropping and fertilizer overuse.

In Ecuador, the campaigns focused on gastronomy as a force to rekindle social appreciation for indigenous producers and their specialty products. The projects advocated for changes to preserve and utilize ancestral crops, connecting small-scale farmers to leading chefs and restaurants to elevate their value. The chefs themselves took on the role of social influencers by holding their own high-level events featuring native products. Two offered cooking workshops at the Madre Semilla (Mother Seed) Festival featuring ancestral seeds, drawing some 700 participants. Similarly, influential food bloggers on social media were tapped to promote recipes using ancestral seeds to further expand public demand for them.

Information

Information influences behavior by providing a foundation of awareness and understanding that helps people take action. It brings knowledge about why certain behaviors are undesirable, why there is a need to change, and instructions for how to do so. To help motivate behavior change, information needs to contain messages that resonate with target audiences and are culturally relevant, palatable, and appealing. It needs to be trustworthy, but rather than a list of facts and figures, information needs to be conveyed in ways that reflect cultural characteristics (e.g., color, design, sayings) and spur interest.

In Kenya, C4C campaigns spread information through a variety of media, including live talk shows, with questions and answers about the implementation of sustainable practices. They created an informational website on good agricultural practices (GAPs), and produced billboards, skits, and t-shirts featuring program messages. Pickup from some of these initiatives was tangible, as noted by one of the C4C training participants. "Within the first hour after our performance and launch of the billboard, we received the first request from a small/medium sized enterprise for organic training," he reported. The information dissemination was bolstered by social influencers, demonstrating the complementarity of behavior change levers. Government officials were involved in spreading the messages and encouraging participation in campaign activities to schools and community groups.

Children were an important target of informational materials across all of the campaigns, as they are important influencers within their own families. Children act as portals of new information and discussion, potentially questioning decisions, choices, or behaviors that adults take for granted. Materials such as plays, puppet shows, and comic books were directly designed to appeal to children, but kids also engaged with other material such as posters, billboards, and music. In Bolivia, one of the campaign training participants noted the novelty for her organization of including children, recognizing how long-lasting such efforts could be. "This is the first time that the children have been taken into account," she said. "We even left them a song that will stay with them and that they will always identify." In Nepal, another participant commented on how empowering it was for the children to take part in the campaign activities. "When I saw the children perform the play at the C4C training, I was surprised by their confidence, and I am confident that they can carry the message forward!" he noted.

The C4C campaigns are designed to foster dialog among peers and with the broader community, using face-to-face opportunities for two-way exchanges of information and ideas. The input from community stakeholders

is key to understanding the context and beliefs guiding their behavioral choices, thus it is essential in the crafting and testing of the campaign materials. But the insights gleaned from conversations with community members also affected the attitudes and behaviors of the campaign designers, as evidenced by this comment from a C4C training participant in Nepal: "After returning from here, I will adopt all my learnings in my own behavior first," he said. "For example, I want to lead more interactive trainings myself, incorporating focus groups and material creation instead of purely classroom-based trainings. I find this training quite motivational and inspirational," he concluded.

Material Incentives

Behavior change can involve a subjective cost-benefit comparison of alternatives, leaning in favor of the option that proposes rewards that exceed the price of adoption. Campaigns used material incentives to help tip the balance towards behavior change, making it easier and more appealing for farmers to change or adapt new behaviors.

In Benin, one campaign project proposed income-generating activities to locals by offering them livestock, such as pigs or chickens, or setting them up to undertake fish farming, gardening, or the raising of cane rat (a source of high-value meat) in exchange for giving up the practice of hunting local wildlife as bushmeat. In Ethiopia, a campaign promoting the uptake of more efficient and sustainable farming techniques among farmers and unemployed youth offered access to training, improved seeds, and irrigation equipment. Another proposed training and beehives for the production of organic honey as an alternative to unsustainable farming and deforestation practices. In Vietnam, a campaign to introduce pollution-eliminating "living bio-beds" for pig farming presented income-generating incentives for farmers through the sale of finished compost, as well as fly larvae and red worms that could be sold as poultry or fish feed. Moreover, it demonstrated the benefit exchange in labor savings and healthier livestock compared to traditional pig pens.

In multiple cases, a major incentive of campaigns was helping to connect farmers to more lucrative markets to raise their incomes and business growth potential. In Ecuador, a program promoting organic polyculture used economic incentives and linked farmers to a guaranteed market for native macambo—a protein-rich relative of cacao with a bean that is lightly toasted and eaten like nuts. The capacity training they offered focused on sustainable, organic production, including an emphasis on quality and hygiene to ensure that their market linkages remain robust. Similarly, projects in Ethiopia and Kenya helped farmers to obtain organic certification for their products and connections to higher value markets that offer better prices and visibility.

Rules and Regulations

Policies that prohibit or encourage certain behaviors can help support an environment of change that turns the desired way of doing into the default option. For example, regulatory reforms that streamline bureaucratic processes or officialize commitments to sustainable solutions can help remove hurdles and promote the socialization of new processes. Likewise, laws prohibiting such things as forest burning, the hunting of wildlife, or the dumping of toxic substances in waterways may help deter unsustainable practices. However, official interdictions can be difficult to enforce and may not be enough to change behaviors on their own. Complementary levers may be critical for reinforcing the intent of various policies and for translating them into actual change. Likewise, bringing community input, experiences, and solutions into the drafting process of rules and regulations can help to ensure they are more relevant and likely to achieve desired effects.

In Colombia, one project took advantage of policies to invest in climate change adaptation to promote the adoption of sustainable practices among local farmers, fishermen, and livestock keepers. Likewise, in Nepal, campaigns built on policies for building resilience to natural disaster to convince farmers to adopt agroecological methods and stop their excessive use of chemical fertilizers, pesticides, and herbicides in fields and of antibiotics to livestock and aquaculture. Another project in Benin used regulations prohibiting the hunting of wildlife for bushmeat, particularly the sitatunga antelope, to offer more sustainable alternatives.

In Vietnam, the C4C training included a participant working for the Ministry of Agriculture and Rural Development assigned to formulate a national organic agricultural decree and organic agricultural development projects. For her, the experience of speaking with stakeholders and developing a C4C campaign helped to inform how to integrate organic agriculture within sustainable development policies and

projects. Speaking of the campaign's promotion of bio-beds for pig farming, she noted, "This is a new start for microbiological fertilizer sources, if the concept of living bio-beds in pig raising is popularized rather than the current ways of pig raising using concrete flooring."

Choice architecture

Our choices about which behaviors to adopt, or not, can be strongly affected by how they are presented or prompted. Individuals are more likely to be swayed into new actions if they are well-timed, salient, or laid out in ways that ease their uptake. All of the C4C campaigns carefully considered where to place information materials, such as billboards, so that they would be visible in places where people naturally passed by or congregated. In Peru, campaign demonstrations were integrated into the normal working schedule of community members, so that they would become a natural extension of everyday activities and contribute to habit formation. The recommended behavior changes were couched within the context of the region's cultural heritage, and campaign launches were scheduled to coincide with local celebrations, anchoring them deeply within cultural traditions and values.

In Benin, a campaign aimed at curbing the destruction of mangrove forests for firewood worked with village women to encourage them to take up the use of improved cookstoves. Along with providing all the material and training support involved in introducing this more sustainable technology, the campaign offered local women a valuable forum for getting together. Thus, the desired behavioral changes were integrated within a framework that tapped into and strengthened their feelings of female solidarity and self-awareness, as well as a form of public commitment that influenced their choices.

In Mexico, a campaign to introduce sustainable agroecological practices for backyard gardens targeted women through their role as family guardians of health and nutrition. The recommended behavior changes and activities were introduced through group trainings and reinforced through a cooking fair and recipe book featuring biodiverse local products, which served as a prompt to use those products. Another similar Mexican campaign aimed at male and female small-scale backyard farmers instituted participatory exchanges of native seeds through fairs and workshops as a way to preserve traditional varieties and promote sustainable agricultural practices. The seed exchanges generated great pride and excitement, and they prompted the sharing of knowledge, ideas, and solutions, as well. Recommended practices were reinforced with visits to demonstration plots and training workshops to serve as reminders and showcase the how-to's and benefits of improved practices.

Moving the Bar

Equipped with tools taught through the 9 C4C trainings in Farming for Biodiversity, local champions set out to replicate their solutions and developed 38 campaigns, spread across Asia, Latin America, and Sub-Saharan Africa. Data from those campaigns demonstrate considerable shifts in attitudes, knowledge, interpersonal communication, and behaviors—particularly compared to expected results.

Each campaign created a theory of change that outlined specific objectives for knowledge, attitudes, interpersonal communication, and behaviors. After collecting baseline data, the campaigners calculated targets for each objective for what they might realistically achieve within the timeline of their campaigns based on a standard rubric created from averages from a meta-analysis of past campaign data.[20] Looking at the objectives by theory of change category (knowledge, attitude, interpersonal communication, behavior change) most campaigns met or exceeded the targets they set which also means that in some cases they outperformed historical campaigns averages.

Of 36 Campaigns with final results at the time of publication[21]

36 campaigns
showed shifts in knowledge = 100%

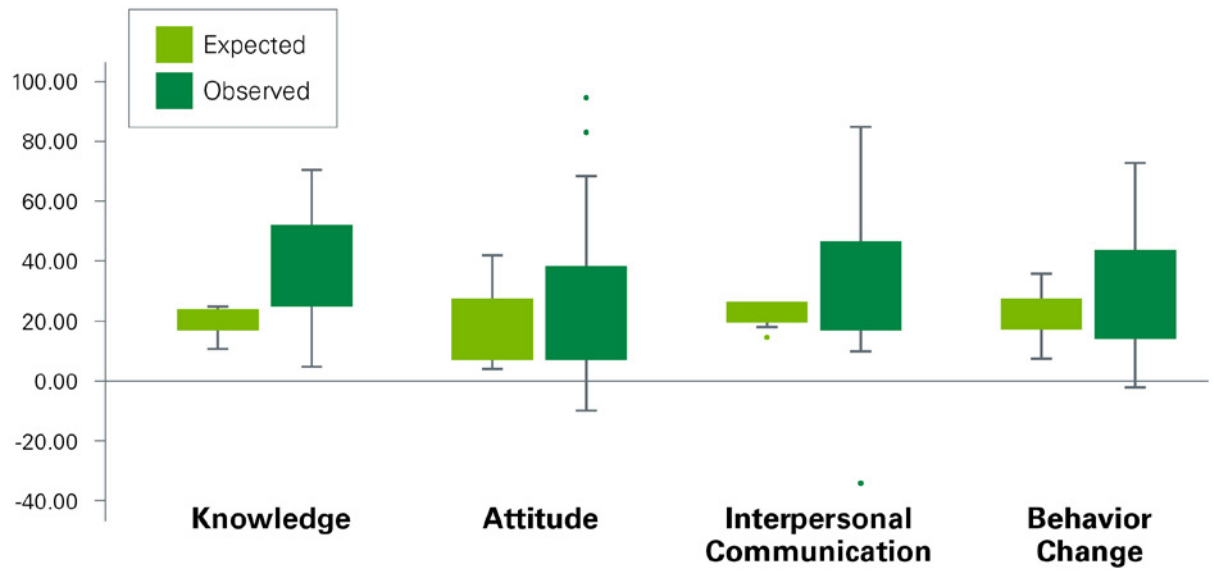
33 campaigns
showed shifts in attitudes = 91%

35 campaigns
showed shifts in interpersonal communication = 97%

31 campaigns
showed shifts in behavior change = 86%

Theory of Change Overview

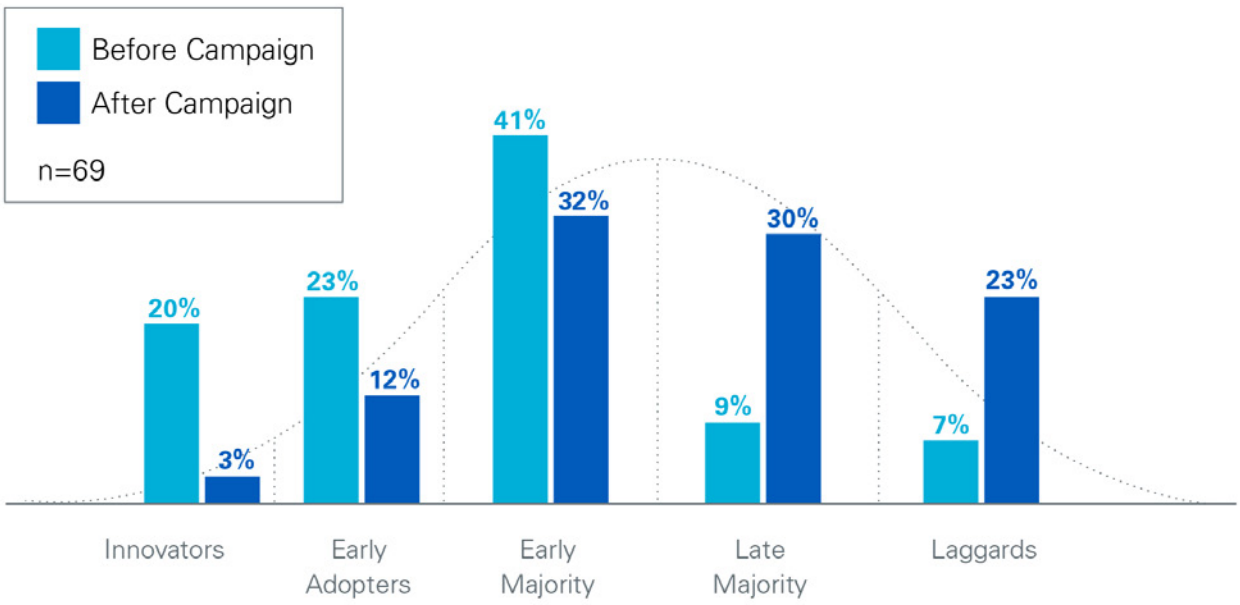
Mean Percent Change Expected vs. Observed by Campaign



For any single behavior change objective, the goal is to determine how much change is needed to achieve an impact that is meaningful to the overall campaign. Across the campaigns many had more than one behavior change objective so in summarizing the collective impact of all of the behaviors across all of the campaigns, it's useful to look at the Diffusion of Innovations curve[22] which seeks to explain how new ideas and behaviors spread among groups of people. Using their baseline data, campaigners assessed how many members of their target audience had already adopted the desired behaviors stated in their campaign theories of change. Using that information, they understood where their audience started from along the standard Diffusion of Innovation curve, used that information to help tailor their messages and materials based on the characteristics of different adopter groups, and then compared to adoption rates in their post-campaign surveys. The hope is to increase adoption so that the target audience advances along the curve to the next category of adopters. Overall, this graph shows how the campaigns shifted from one adopter category to the next (in some cases two categories), meaning higher percentages of their target audiences adopted the desired behaviors. This also helps the campaigners to the define the path of their future work whether it be to update calls to action and continue to reach new audience members or provide reinforcing messages and support to maintain adoption at current levels.

Innovation Curve Comparisons

Percent of behavior change objectives reaching categories of adopters along the Diffusion of Innovations curve



Standard adopter categories from (Rogers, 1962)

Spreading Solutions—and Their Benefits

The impacts of the C4C campaigns spread well beyond those measured by the expected outcomes and can be gauged through impacts such as increased social cohesion, greater valuation of indigenous people and resources, and the development of a new cadre of biodiversity leaders and networks. Campaigns also reported such advances as livelihood improvements within their target communities and the establishment of natural resource management committees. Young people, including children, became highly engaged in the campaign activities themselves, both as message makers and message takers. Women and their roles as community change makers were validated, with many rising to new levels of leadership on local and even international stages.

The campaigns strengthened the capacities of small organizations to play big parts in sharing solutions and stimulating the behavior changes that can reconcile food production with biodiversity preservation. They helped raise community consciousness about how agricultural products are produced and consumed, and the extent to which local stakeholders can themselves spearhead the sustainable practices that will guide their future development and resilience.

The C4C trainings also highlighted the invaluable role of "multipliers"—those individuals who help drive the positive ripple effects of the campaigns as connectors between the community and recommended practices. While their job titles and roles may vary, they are the people who inspire behavioral change through of their ability to motivate and connect with target audiences. One of the key lessons of the training workshops was the need to identify these individuals across different organizations and interventions, and find creative ways to support their contributions and strengthen their capacities.

Another lesson is in the power of networks. Following the C4C trainings, the project created an opportunity for the individuals running campaigns to connect globally with each other via quarterly Zoom meetings. The campaigners helped, motivated, and supported each other regardless of their backgrounds, geographies, and languages—an inspiring testament to the importance of creating spaces for these networks to grow.

Thanks to the support of networks and partners, the campaigners received recognition from policy makers. As part of the project, some of the local champions had the opportunity to speak at esteemed global events such as the UN Food and Agriculture Organization's (FAO) Committee on Food Security (CFS) in Rome, the World Social Marketing Conference and the UN Convention on Biodiversity 13th Conference of the Parties (UN CBD COP13). This did not only give campaigners the opportunity to build a network and to develop critical professional skills. It also linked local voices to the global policy stage which was welcomed by many partners and organizations.

The campaigners also benefited tremendously from the support of other networks. Deutsche Welle and the 27+ media outlets we worked with created visibility for the project and amplified the stories of several campaigners. Other partners such as PANORAMA provided additional platforms for hosting and promoting the solutions to a global audience. Further, the Young Professionals for Agricultural Development (YPARD), the Global Landscapes Forum (GLF) and many more promoted both the solutions and individual campaigners within their networks.

> **We have noticed a strengthening of solidarity among women in the same village. Which solidarity is needed to enable them to strengthen their leadership and assert their rights."**
>
> **– Final C4C Campaign Report, Benin**

Voices of Change

The broader effects and impacts of the Farming for Biodiversity C4C campaigns also can be measured by the comments and testimonials of participants.

"I am a stay-at-home mom with two kids, but I also look after our 26 goats. My husband is currently in Malaysia, working as a driver for a company there. The host of this training, NDRC, did a lot of good things in our community. After I heard of this training, I knew I had to go, so I could educate the other women in my village. There are a lot of illiterate women where I live, and one of the first things I want to tell them about is the benefits of zero tillage and organic farming. Right now, they are buying a lot from stores, but I will advise them that they can actually grow a variety of crops in their field. I feel there should be specialized trainings for women like me. If you can empower us, we can empower others."

– Kamala Sunari Magarand, Nepal

"I have a Master's Degree in Project Management and I am the coordinator of an NGO called AFVA. I learned a lot from this training, and as soon as I return home, I will teach other women about the methods and benefits of organic agriculture. I also expect to put into practice the Theory of Change methodology we have learned to address the problems we are facing. In the past, we had projects that failed because they were not set within such a framework, but thanks to this training and the social marketing tools I have gained, I know that I can be successful."

– Elise Tama, Benin

"[We train] our students to be future facilitators for transforming schools and colleges into green, clean, healthy and productive environments. In fact, this training has really empowered me to approach the community, with the goal of changing their behavior and farming practices."

– Stephen Masetu Indikah, Kenya

Since we did the Campaigning for Conservation workshop here in March, things have changed. We have done more than five farmer trainings, including for a group that came all the way from South Sudan. We are proud of our campaign."

– David Mwangi, Kenya

I have just completed my secondary education. The most interesting thing I learned is that my mom and dad actually always practiced this thing called zero tillage farming. But I did not know about all the benefits it has! When I get back to my community, I will be spreading the word more around organic farming!"

– Nimkala Saru Magar, Nepal

The training has helped me as I learned about more ways to interact with communities. I also had the chance to link up and network with other organizations and I hope that we can collaborate with them in the future."

– Zablon Musumba Ombima, Kenya

Creating Two-Way Synergies Between Local Action and Global Goals

This table shows how global goals can empower local solutions and how C4C campaigns and local solutions fit into the Global Framework for Biodiversity Solutions and the Objectives of United Nations Decade on Ecosystem Restoration (2021-2030).

Global Framework for Biodiversity Solutions	Objectives of United Nations Decade on Ecosystem Restoration (2021-2030)	C4C Campaigns
Avoid duplication and enhance complementarity with existing frameworks.	Showcase successful government-led and private initiatives to halt ecosystem degradation, restore those ecosystems that have already been degraded.	C4C Campaigns fills a unique space, through their focuses on community-generated solutions and on the central role of behavior/choice in mitigation, adaptation, and the beneficial co-habitation of farming/biodiversity.
Reflect the pathway from where we are now to the changes we'd like to see in 2050. **Have focused, concrete and measurable Action Targets.**		C4C Campaigns are giving community initiatives and leaders the tools to articulate a vision, the pathways for reaching it, and the ability to measure advances (through smart objectives, Theory of Change, and qualitative/ quantitative analytical tools).
Reflect the objectives of the Convention on Biological Diversity as well as the three components of biodiversity.		C4C Campaigns address the preservation of genetic variety among crops, animal and plant species, microbia, as well as ecosystems and habitats.
Be a truly global framework creating synergies with other global conventions.	Enhance knowledge exchange on what works and why (policy, economics and biophysical aspects), and how to implement restoration at scale.	C4C Campaigns are spreading solutions across the globe, building partnerships, creating networks, supporting shared training and campaign designing, and showcasing them through international platforms .

Global Framework for Biodiversity Solutions	Objectives of United Nations Decade on Ecosystem Restoration (2021-2030)	C4C Campaigns
Integrate Nature-based Solutions to safeguard and maintain ecosystems.		C4C Campaigns' collaboration with IFOAM is integrating organic and conservation agricultural methods. Locally sourced materials and resources are valued/emphasized.
Embrace all voices.	Bring a broader spectrum of actors on board:	C4C Campaigns work with indigenous peoples and local communities (with a special focus on women and youths) across the globe to form leaders and give voice to their needs, preferences, and solutions. They also collaborate actively with regional and city governments, faith leaders, the private sector, NGOs, schools, etc.
	Connect initiatives working in the same landscape, region, or topic, to increase efficiency and impact.	C4C trainings are building connections and cross-fertilization across communities facing similar challenges—creating networks, peer-to-peer linkages, and reinforcing commonalities across countries and continents.
	Create links between ecosystem restoration opportunities and initiatives with businesses interested in building a robust portfolio of sustainable production and impact investment.	C4C Campaigns are tapping into an expanding market for products that are certified organic or other designations (free trade, landscape label, wildlife friendly); and creating linkages between small-scale producers and high-end gourmet buyers for heritage crops/native varieties.

Conclusion and Recommendations for Action

In communities around the world, the Farming for Biodiversity approach is replicating promising solutions. Adapted to local cultures and contexts, projects and campaigns are moving the bar to reach locally led objectives and engagement for positive changes that can improve livelihoods, ensure sustainable food production, and protect the valuable ecosystems on which we rely.

The lessons and experiences of the Solutions Search contest and the Campaign for Conservation/IFOAM trainings offer a range of recommendations. They address a wide variety of audiences, as demonstrated below.

Donors, Investment/ Business Sector Partners

- Recognize and promote the value of community solutions by ensuring that funding and investments target the local level directly, where they can bolster local leaders, successes, and change-making capacity.
- Support initiatives that identify, recognize, and offer capacity strengthening for individuals who act as "multipliers"—those who are able to link solutions to communities by virtue of their people skills, cultural connections, and genuine interest in promoting sustainable practices.
- Integrate holistic campaigns including behaviourally-informed change communications, advocacy and citizen engagement, and social marketing efforts into solicitations for programs or partnerships that aim to advance more sustainable farming systems, livelihoods enhancement, and consumer demand.
- Reward programs and research that capture the processes and qualitative aspects of initiatives seeking to instill more sustainable behaviors, practices, and activities.
- Sponsor or adopt C4C campaigns and the further dissemination of their methodologies, products, and reach to scale up proven local solutions.
- Work in partnership with governments, investors, and fellow business community members to fund incentives (e.g., direct payments, carbon offset payments, academic certification, prizes, other recognitions) that reward environmentally and economically sustainable farming, so that it becomes an occupation of choice.
- Launch contests, rewards, scholarships, networks, mentoring programs, and events to encourage young people to engage in farming for biodiversity through strategies that integrate business development, financial inclusion, new technologies, communications, and innovative linkages.
- Invest in indigenous communities and women as agents of change in biodiversity conservation and agricultural/economic development.
- Review practices within your own institutions to ensure they are in line with sustainable behaviors. Such behaviors may include reducing food waste, purchasing organic and sustainable foods/supplies, adopting energy conservation/ clean energy solutions, eliminating plastic waste, promoting gender equity and indigenous rights with your organizations.
- For guidance on relevant documents and frameworks, see, for example, the CBD Secretary General's Note on Mainstreaming Biodiversity Across Sectors[23] and Rare Behavior Change Levers.[24]
- Take a cross-sectoral approach in planning and use the "Guidance on Agriculture, Crop, and Livestock" of the Cancun Declaration on Mainstreaming the Conservation and Sustainable Use of Biodiversity for Well-Being[25] when addressing biodiversity and food systems.

Policymakers

- Elevate local voices on the global stage and allow for their needs and aspirations to be heard.
- Establish mechanisms to support funding streams, monitoring & evaluation, and accountabilities that reach down to community levels and help advance (sub) national-level plans for reconciling environmental protection with agricultural production and socio-economic improvements.
- Create enabling environments through policies, social structures, and financial incentives that support community and local-level biodiversity stewardship with agricultural production.
- Bring on board other policy makers who may not have a full understanding of the economic, social, and environmental costs of biodiversity loss, nor of the financial and political benefits and opportunities related to sustainable food production.
- Work with policy actors from local and regional levels to inform and align with national and international strategies for conservation, agricultural development, and economic development.

- Find creative ways to link conservation activities within the country with international support mechanisms such as REDD+, the Sustainable Development Goals, the Paris Climate Accord, and the Convention on Biodiversity's strategic plan and vision.

- Beware of and eliminate the subsidizing of policies that harm biodiversity and its linkages with food production in the name of increased productivity (e.g., support for palm oil plantations, monoculture, overproduction, high use of chemical fertilizers/pesticides).

- Strengthen agricultural advisory services and establish farmer-to-farmer learning initiatives as well as networks to scale up and scale out sustainable innovations, and to demonstrate that biodiversity and increased food production can, and must, be compatible.

Researchers and Program Planners

- Empower local leaders/solutions through shared capacity strengthening, recognition, and collaboration.

- Apply, adapt, and improve the frameworks elaborated by Rare's Center for Behavior and the Environment to blend insights from behavioral science and design thinking for breakthrough solutions to environmental challenges.[26,27,28]

- Investigate ways to measure and validate the qualitative impacts of community-level initiatives, and their broader implications for supporting biodiversity and sustainable development goals.

- Apply participatory approaches and human-centered design models, putting leaders and communities at the center of problem solving and change, so that they truly become transformational.

- Respect,recognize, and leverage indigenous knowledge/rights. Establish free prior and informed consent with indigenous communities to define rights and protections. Conduct applied research with indigenous researchers and community members. Give space in official reports to local names of tribes, people, and native varieties.

- Show that conservation is not a barrier to economic development—produce the numbers and evidence base to demonstrate that biodiversity and increased food production can, and must, be compatible.

- Look at the big picture. Consider how broader social, political, economic, ecological, and physical dimensions (e.g., urbanization, farmland, forests, water sources) fit together and affect natural resource use and management.

- Practice gender equity.

- Promote ways to attract and retain young researchers.

Consumers

- Build demand for sustainably produced products, such as those certified as organic, wildlife friendly, fair trade, etc., and those promoting indigenous foods, people, and traditions.

- Pressure companies to monitor their supply chains, to ensure agricultural goods are being produced in ways that protect natural resources (e.g., are not destroying forests) and that regulations to protect people and the environment are being enforced.

- Take part in and support social marketing campaigns, become a force for change as a leader and by modeling changes in your own consumer behaviors (e.g., recycle, plant gardens, reduce use of fossil fuels, etc.)

- Get to know the biodiversity in your own environment, and what you can do to help preserve and value it.

Communities

- Increase awareness of farming for biodiversity solutions, and promote behavior changes that increase biodiversity stewardship, learning from each other.

- Support and advocate for government policies and actions that conserve ecosystems and promote sustainable food production (e.g., establishing protected lands or subsidies/payments for sustainable practices).

- Become educators, role models, and leaders in methods that reduce the risks to biodiversity and the environment, and that promote food production and improved livelihoods.

- Share the preservation and use of indigenous plants, animals, techniques, and knowledge by partnering with schools, seed banks, and organizations that respect local rights and resources.

- Devise and implement community agreements and management of natural resources for shared benefits and a cleaner environment.

Endnotes

1 FAO Calls for the Adoption of "Biodiversity-Friendly" Practices in Agriculture. (2019). http://www.fao.org/neareast/news/view/en/c/1244948/

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14 https://www.mercycorps.org/blog/climate-change-poverty

15 https://www.iucn.org/commissions/species-survival-commission/our-work/reverse-red/species-conservation-works

16 https://rare.org/report/behavior-change-for-nature/

17 ibid

18 https://behavioralscientist.org/fight-climate-change-with-behavior-change/

19 https://rare.org/report/behavior-change-for-nature/

20 Green, K. M., Crawford, B. A., Williamson, K. A., Dewan, A. A. (2019). A meta-analysis of social marketing campaigns to improve global conservation outcomes. Social Marketing Quarterly, 25, 69–87.

21 Of the 38 campaigns, about a third of them had campaign or post-surveys activities planned for the beginning of 2020 when the Covid-19 pandemic broke-out. While campaigners in many countries were able to creatively and safely resume activities according to local regulations in order to finish their final reports, two campaigns in Nepal completed their campaigns but have been unable to complete their post-surveys by the time of publication so are not included in these figures. We thank all of the campaigners for their resiliency and hard work during this difficult time.

22 Rogers, E. M. (1962). Diffusion of innovations. New York: Free Press of Glencoe.

23 https://www.cbd.int/mainstreaming/doc/mainstreaming-reference-document-SCBD.pdf

24 https://behavior.rare.org/behavioral-science-landing/

25 https://www.cbd.int/cop/cop-13/hls/cancun%20declaration-en.pdf

26 https://behavior.rare.org/behavioral-science-landing/

27 https://behavior.rare.org/behavior-centered-design-landing/

28 https://behavior.rare.org/resources/literature-review/

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