

Farming for Biodiversity

Proven Solutions Meet Global Policy

Analysis report based on a worldwide Solution Search



Convention on
Biological Diversity

Supported by:



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We are grateful to all 338 individuals and organizations for sharing their solutions with us, and the technical and high-level judging panels evaluating submissions.

This report also benefited from helpful comments by Paul Butler, Gabor Figeczky, David Gould, Jörg Lohmann, Kate Mannle, Gerald Miles, Katie Velasco and Ariane Steins-Meier.

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Foreword

FEDERAL MINISTRY FOR THE ENVIRONMENT, NATURE CONSERVATION AND NUCLEAR SAFETY, FEDERAL REPUBLIC OF GERMANY

Rich biodiversity and viable ecosystems are the foundations of human existence and well-being. They protect us from natural disasters, regulate the climate, and provide food, fertile soil and medicine. Therefore, conserving biological diversity is key to achieving sustainable development worldwide. However, recent scientific findings paint a bleak picture: biological diversity is in decline in all regions of the world. Although we know a lot about the drivers behind this loss, we still need to do more to address them. One such driver is unsustainable agriculture, for example the excessive use of chemical pesticides, fertilizers and monocultures.

Over 300 solutions gathered by Rare and IFOAM - Organics International through Solution Search: Farming for Biodiversity prove that sustainable agriculture can also contribute to the protection of biodiversity. In addition, this report identifies the success factors they have in common, allowing us to scale up and replicate proven solutions elsewhere.

One particularly important finding is that technical innovations, additional finance and stricter regulations are often not enough to stop the loss of biodiversity. In order to succeed, these measures need to take into account local knowledge and the social context. The report shows how the most successful solutions combine technical and socio-economic strategies to bring about positive change in the ways we grow and consume food and other agricultural products.

Solution Search: Farming for Biodiversity has put a spotlight on the many ways in which local champions and communities can spearhead the transition to sustainable land use. Focusing on the cases where people succeeded in biodiversity-friendly farming – and supporting the champions behind them – can lead to a major multiplier effect.

In order to enhance implementation of the Aichi Biodiversity Targets and design a robust post-2020 global biodiversity framework, we need strong global momentum – and the ingenuity and experience of local communities.



Svenja Schulze

Federal Minister for the Environment, Nature Conservation and Nuclear Safety,
Federal Republic of Germany

Foreword

CONVENTION ON BIOLOGICAL DIVERSITY

Biodiversity and the services that nature provides are essential to the food we eat today and to our food security tomorrow. We only need to turn to our plates to see, smell and taste the value of biodiversity, or examine closely the nature of famine, to discover the consequences of extreme biodiversity loss. The evolution of farming systems since the development of agriculture some 10,000 years ago is now at a critical juncture in history. If we make the right choices, we have an opportunity to conserve, restore and sustainably use biodiversity, and reverse, in this way, some of the prevalent trends in agriculture and land use that threaten our planetary boundaries and food security.

There are reasons to be optimistic. Over the past couple of years, there have been positive changes — brightspots. A 15 percent increase worldwide in organic farmland and a steady growth in consumer interest in sustainable food sources are examples that show that the systems transformation we need has already started.

By teaming up with Rare, a global leader in behavior change and the environment, and IFOAM - Organics International, the Convention on Biological Diversity (CBD) Secretariat has started to explore the drivers that are making positive change in this sector. The results are impressive. Through the global crowdsourcing contest Solution Search: Farming for Biodiversity, we unearthed another 338 brightspots across all continents, which show how agriculture can succeed by working in harmony with nature.

This report brings the stories behind those solutions to life. It also provides valuable guidance by identifying success factors common across solutions, as well as the role that change agents can play — including policymakers, investors and citizens — to enable success.

The report could not be more timely: Parties to the Convention are discussing what is needed to accelerate progress on the current 20 Aichi Biodiversity Targets as well as to lay the foundation for a New Deal for Nature that will take us to 2030 and beyond. One thing the report makes clear is that agricultural communities will play an essential role in showcasing their contribution to a nature action agenda: in the transformation of public thinking, attitudes and policies (Goal A); finding context-sensitive solutions to biodiversity threats (Goal B); safeguarding biodiversity by acting as its champions (Goal C); creating win-wins that incentivize sustainable behavior (Goal D); and driving implementation of the Convention (Goal E).

This message is of crucial importance, as our natural ecosystems provide the essential infrastructure supporting human development and life on the planet. We cannot halt the biodiversity crisis by working in isolation, cocooned in specialized bubbles that do not interact with each other. The complexity of the interdependencies between human, social, and economic systems, and the Earth's natural systems requires interconnected measures and solutions. **Community-led solutions that work on the ground and can be scaled and replicated elsewhere are at the heart of this change. Together with a deeper understanding of what drives and motivates human behavior, these types of solutions will bring about the change that will allow the Convention to impactfully touch people's lives.**

We are looking forward to the training and behavior change campaign stage of the initiative, as we scale up selected solutions in eight countries. And it is with sincere gratitude that I thank the German Environment Ministry (BMU) and its International Climate Initiative for making this project possible.

As one global community “United for Nature,” we can transform the way we relate with biodiversity for our benefit and for future generations.

Enjoy your read!



Dr. Cristiana Paşca Palmer
UN Assistant Secretary General
Executive Secretary
Secretariat of the Convention on Biological Diversity

Executive Summary

FARMING FOR BIODIVERSITY LESSONS LEARNED REPORT



The Convention on Biological Diversity's Executive Secretary Cristiana Paşca-Palmer describes the loss of biodiversity as a "silent killer". For many of us, the loss may not feel immediately palpable in everyday life. By the time we feel what's happening and recognize the changing face of the Earth, it may be too late.

There is still hope for preserving what's left of the world's rich diversity of life. Producers and consumers that adopt and spur demand for sustainable farming practices — such as those that protect soils, water, forests, and fish stocks — play a key role in stopping biodiversity loss. But too often, these innovative actors and their solutions operate unseen and unheard — silent, like the issue they face. We must, then, be willing to search for them.

As part of a global initiative, Solution Search: Farming for Biodiversity set out in 2017 to identify, reward and spotlight the people and approaches that have successfully driven the adoption of biodiversity-friendly agriculture. Initially aiming for 100 submissions, the contest's 26 partner organizations unearthed 338 proven solutions.

The solutions came from a diversity of sources, ranging from established international research institutions to young scientists testing a proof of concept, from private companies to community led initiatives, and from foundations to family-run projects. The six winners of the contest (pages 9-10) exemplify this diversity.

The solutions not only showcase biodiversity-friendly farming approaches that work on the ground, but also point to valuable lessons for the global policy frameworks needed to protect our shared environment.

While solutions vary in approach and scale, this report identifies "steps to success" that are common to all of them and correspond with the current Convention on Biological Diversity (CBD) Strategic Goals:

1. Transforming public thinking, attitudes and policies combined with behavioral insights to change people's practice is crucial for achieving **Goal A** – Mainstreaming biodiversity across government and society (pages 18-20)
2. To reduce direct pressures on biodiversity (**Goal B**), local solutions suited to ecological and economic contexts are most successful (pages 20-22)
3. Identifying and working with biodiversity champions is key to CBD **Goal C** – the safeguarding of ecosystems, species and genetic diversity (pages 22-24)
4. Setting incentives and economic returns for farming communities is crucial for **Goal D** – enhancing the benefits of biodiversity and ecosystem services for all (pages 24-26)
5. Creating spaces and support for bottom-up community engagement is fundamental to enhancing implementation (CBD **Goal E**, pages 26-28)

This shows that communities – be they producer or consumer communities – are at the heart of biodiversity protection and sustainable use of its resources. Efforts to stop biodiversity loss should seek to strengthen and support the positive potential of community involvement, underpinned by a better understanding of what motivates human behavior and decision-making.

The Post-2020 global biodiversity framework could therefore benefit from increased attention to communities and behavior insights. Using proven solutions as case studies, the report further shows the close relation and interdependency between biodiversity and the Sustainable Development Goals.

The final section of the report (pages 30-32) identifies recommendations for funding partners, policymakers, researchers and program planners focused on removing barriers to community engagement in sustainable farming solutions as well as providing enabling governance framework and funding structures.

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The Search for Solutions

Why reinvent the wheel? Find what works and repeat it.

Solutions to some of the world’s greatest conservation and development challenges are being devised in communities across the globe. However, all too often, they remain at the local level and go unnoticed by society at large. Solution Search: Farming for Biodiversity¹ was devised as a crowd sourcing contest to identify and help replicate community-driven solutions from around the world that align biodiversity preservation with agricultural production.

With the understanding that local action can inspire national and global leaders to act, this report aims to collect insights and learn from the solutions in order to scale and multiply them. In turn, the report aims to inspire peer-to-peer learning and discussions.

Biodiversity provides a rich genetic treasure trove for maintaining food and livestock production in the face of climate change and other unexpected forces. Current rates of biodiversity loss², however, are destabilizing ecosystems and reducing their ability to deal with natural and man-made stresses such as drought, pollution, and unpredictable weather patterns. Preserving biodiversity is thus a critical element of safeguarding food security and improving incomes for the world’s smallholder farmers. Rising demand for organic and sustainably-produced food offers positive economic incentives for producers to implement more biodiversity-friendly methods, helping to create win-wins for farmers and for the future of our planet.

The Farming for Biodiversity³ contest is part of a broader initiative led by Rare,⁴ aimed at taking agricultural solutions to scale in multiple contexts around the world. Contest partners included Blue Solutions⁵; the Convention on

“Biodiversity is an integral part of agriculture and of any and every decision made in agricultural activity. Be it animal or plant-based, biodiversity is a crucial resource for sustainable farming and agricultural activities.”

– **Jörg Lohmann**, Biodiversity and Ecosystem Services in Agrarian Landscapes⁹, German Federal Enterprise for International Cooperation (GIZ) and Farming for Biodiversity Technical Contest Judge

Biological Diversity⁶; EcoAgriculture Partners⁷; Global Island Partnership⁸; IFOAM Organics International⁹; Panorama¹⁰; Patagonia¹¹; Save the Children¹²; and Young Professionals for Agricultural Development¹³ (YPARD). The initiative is supported by the German Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety¹⁴.

Solution Search: Farming for Biodiversity set out to uncover sustainable behavior changes and activities that could be adopted not only by farmers and other contest participants, but also by consumers and decision-makers across all sectors. The contest offered the chance to learn from the diversity of actors engaged in the topic to inform and improve policies, programming, investments, and

priorities directed at increasing the food supply while also protecting the environment.

The response to Solution Search: Farming for Biodiversity and its call for entries surpassed expectations, with 338 submissions from all over the world. Submissions came from a diversity of sources, ranging from established international research institutions to young scientists testing a proof of concept, from private companies to community led initiatives, and from foundations to family-run projects.

Contest submissions also reflect a rich array of partnerships among government agencies, research institutions, environmental groups, food and agribusinesses, and others. Their collaborations span multiple sectors and are helping to push a paradigm shift in agriculture by filling knowledge gaps in the science and economics of sustainable food production methods. They are contributing to the transformation of conventional agricultural practices into ones that take into account the value¹⁵ of natural resources and the societal costs of environmental and biodiversity losses. Indeed, the ability to associate hard numbers with the price of biodiversity loss and resulting ecosystem declines can prompt decision-makers to recognize and incorporate the worth of these natural resources in social and business policies.

Many of the world’s greatest biodiversity hotspots¹⁶ are located in countries burdened with high rates of poverty¹⁷, food insecurity, and the effects of intensifying climate change¹⁸. More than 85 percent of the Solution Search: Farming for Biodiversity entries are focused on developing countries. But the risks facing biodiversity (Figure 1) easily cross geographic and economic boundaries. Farming for Biodiversity analyzes the surfaced ideas from a global perspective, as the job of finding solutions — to safeguard biodiversity, food security and livelihoods — is shared across the global community.

Upon receiving the 338 submissions, an international jury of more than 30 agriculture and biodiversity experts from multiple disciplines^A selected a short list of outstanding solutions in six categories. In a second stage, a group of high-level judges picked the finalists, followed later by the selection of a “Judges’ Choice” grand prize winner. The winner of the “People’s Choice” grand prize was selected by a global audience following an online voting process.

These are the award-winning local champions, who were recognized and celebrated for their solutions at the 2017 climate change conference in Bonn (COP23).

SOLUTION SEARCH: FARMING FOR BIODIVERSITY – BY THE NUMBERS

338

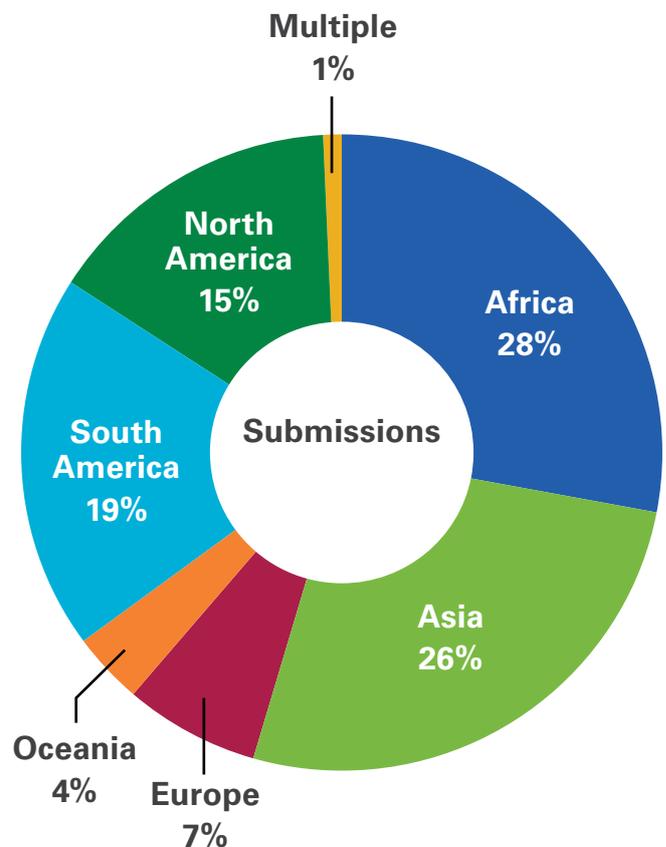
Submissions

19,522

Votes cast online

474,946,477

Media impressions reached through contest campaign



A The following 26 organizations joined as contest partners and judges: Blue Solutions, CONABIO, Cornell University, Deutsche Welle, EcoAgriculture Partners, EcoLogic, FoodTank, Global Alliance for Improved Nutrition (GAIN), Global Environment Facility (GEF), GIZ, Global Island Partnership, Greenpeace, IDB, International Indigenous Peoples’ Forum on Climate Change, Joint Nature Conservation Committee (JNCC), Michael Otto Stiftung, Nuru International, PANORAMA, Patagonia, Save the Children, Stockholm Environment Institute, Stockholm Resilience Center, the United Nations Rapporteur for the Rights of Indigenous Peoples, USAID, WWF, Young Professionals for Agricultural Development (YPARD)

SOLUTION SEARCH: FARMING FOR BIODIVERSITY – WINNERS



People's Choice

Apis Agribusiness (Ethiopia), fighting youth unemployment and deforestation with organic honey production



Judges' Choice

National Disaster Risk Reduction Centre (Nepal), working with 14,000 indigenous households to switch to climate-resilient land management



Biodiversity Impact

Fundación Ecotop (Bolivia), introducing successional agroforestry to tackle malnutrition and forest degradation

SOLUTION SEARCH: FARMING FOR BIODIVERSITY – WINNERS



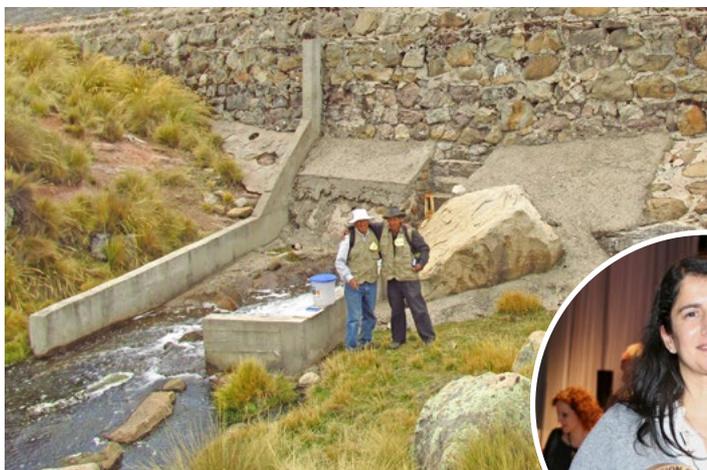
Community & Social Impact

Fairventures Worldwide (Indonesia), creating an economically viable alternative to palm oil monoculture in Borneo



Food Security & Nutrition Impact

Desarrollo Alternativo e Investigación A.C. (Mexico), saving local maize and bean species while increasing yields by at least 10%



Water Impact

The Mountain Institute (Peru), reviving ancient Pre-Incan water systems to protect the Puna grasslands and strengthen water security

SOLUTION SEARCH: FARMING FOR BIODIVERSITY – HIGH-LEVEL JUDGES



Bonnie McClafferty
Director, Agriculture and Nutrition, GAIN



Cristiana Paşca Palmer
Executive Secretary, Convention on Biological Diversity



Ilona Porsché
Head, Blue Solutions Initiative (formerly)



Jason Clay
Senior Vice President for Markets and Food, World Wildlife Fund



Juan Pablo Bonilla
Sector Manager, Climate Change and Sustainable Development, Inter-American Development Bank



Manuela Kasper-Claridge
Deputy Editor-in-Chief and Head, Business and Science Department, Deutsche Welle



Naoko Ishii
CEO and Chairperson, Global Environment Facility



Pedro Álvarez Icaza L.
General Coordinator for Biological Corridors & Resources, CONABIO (Mexico)



Per Olsson
Stockholm Resilience Center



Sarah Hayes
Senior Material Research & Innovation Manager, Patagonia Inc.



Victoria Tauli-Corpuz
United Nations Rapporteur on the Rights of Indigenous Peoples

PRACTICING “SOLUTIONOLOGY”

Rare has been holding Solution Search contests together with partners since 2011. The contests have surfaced over 700 proven or promising solutions to problems such as overfishing, climate change, and natural disasters. A panel of judges, with expertise ranging from economics to agriculture and from biodiversity to behavior change, reviews the submissions and debates their merits and replicability. Contest winners are chosen by both the judges and the general public. They receive prize money and practical support to go to scale, and they are featured at prominent global events and trainings to shine the spotlight on successful innovations that can be taken up around the world. Selected solutions from the contests have been taken up and adapted by Rare in the course of its conservation and development work, and by other global development partners as well. Visit solutionsearch.org to read more about Solution Search.

Why Farming for Biodiversity Matters

Growing the food to feed our planet takes more than 570 million farms worldwide²⁰, most of which are small, operating on less than two hectares, and family-run. In developing countries, small-scale agriculture is a mainstay of employment and subsistence for men and women, and it supplies most of the food consumed in urban areas.

Biodiversity is essential for agriculture²¹ and serves as its base. All species of crops and livestock have their origins in biodiversity. Variability within that diversity has ensured the evolution of farming systems since the development of agriculture some 10,000 years ago and will continue to do so into the future. Moreover, as species vary in the ways they acquire and maintain resources (such as water, nutrients, or carbon), biodiversity enhances farming ecosystems. More biodiversity leads to greater biomass and healthier soils, which are critical for ensuring and increasing food production. Conversely, when 40 percent or more²² of the species in an ecosystem disappear — whether plant, animal, insect, fungi, or microbe — the effects can be as devastating as those caused by major drought.

The interrelationship between farming and biodiversity is a delicate balance.

“Agriculture and biodiversity are often perceived as being in conflict, but that represents a flawed understanding of ecology and how things work. From biodiversity we get food security. If we are farming in a way that supports biodiversity, we will ultimately be supporting ourselves.”

– **Kate Mannle**, Director, Campaigning for Conservation, Rare and Solution Search Technical Judge

Unsustainable agricultural practices such as deforestation, environmental degradation and overfishing, along with an over-reliance on a narrow range of plant and animal varieties in intensified food systems, are key threats to biodiversity. For example, the UN Food and Agriculture

WHAT IS BIODIVERSITY?

Biodiversity is the genetic variety among and within plant, animal, and microbial species inherited over millennia. The biodiversity among agricultural crops or livestock is known as agrobiodiversity. It results from thousands of years of natural and human selection for preferred traits, affecting such things as yields, size, taste, and adaptation to different production conditions. Ecological biodiversity also exists across ecosystems, natural communities, and habitats.

Organization (FAO) estimates²³ that the number of crop varieties used in agriculture represents a mere 10 percent of those that could be grown for food, while the practice of monoculture over crop rotation is depleting soils and damaging wider ecosystems.

Yet agricultural development can have a key positive role to play in preserving agro- and ecological biodiversity, and ensuring that food production both promotes and is enhanced by biodiversity. Sustainable farming practices — such as those that protect soils, water, forests, and fishing stocks — can conserve and enhance biodiversity. Connecting the practices and their products to value chains and increasing consumer demand for sustainably-developed products also results in improved incomes and livelihoods for smallholder farmers. Thus, shifting attitudes, behaviors, policies and practices toward greener food production and consumption systems is essential for increasing the sustainable use and conservation of biodiversity — and practicing farming for biodiversity.

The rich array of approaches elicited by the Solution Search: Farming for Biodiversity makes it clear that communities hold the key to connecting agriculture and biodiversity for a sustainable future – be they communities of farmers, consumers, youth, policymakers, or other engaged stakeholders. The task for program planners, donors, and decision-makers is to value and support such community-led efforts with enabling policies, new technologies, and wider socio-economic or behavioral change incentives that can drive best practices and further spur game-changing solutions.

Global Framework to Empower Local Biodiversity Solutions

The Convention on Biological Diversity (CBD) identifies five primary threats²⁴ to biodiversity, including climate change, habitat loss and deforestation, invasive alien species, nutrient loading and pollution, and unsustainable overexploitation of natural resources. However, the underlying drivers of biodiversity loss are broader and widely associated with human activities and behavior.

For example, a new report²⁵ published by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) underlines the role of the high-consumption lifestyles of wealthy countries, combined with rising consumption patterns in emerging economies, in the current increase in biodiversity loss. Amplified by continued population growth in many parts of the world, our insatiable demand for consumables is

pushing unsustainable levels of agricultural expansion, natural resource and mineral extraction, and urbanization, which are degrading our land, forests and water systems. The toll on our planet’s biodiversity and ecosystem services is estimated to cost²⁶ the equivalent of about 10 percent of the world’s annual gross product.

However, this trajectory is far from inevitable. Human behavior is as intertwined with preserving biodiversity as it is with driving its loss, and stable ecosystems are fundamental to maintaining social stability and economic growth. As exemplified by the Farming for Biodiversity contest’s most outstanding solutions, switches to more sustainable behaviors and attitudes do happen in producer and consumer communities – offering an outlet for hope and sustainable change.

Threats to Biodiversity

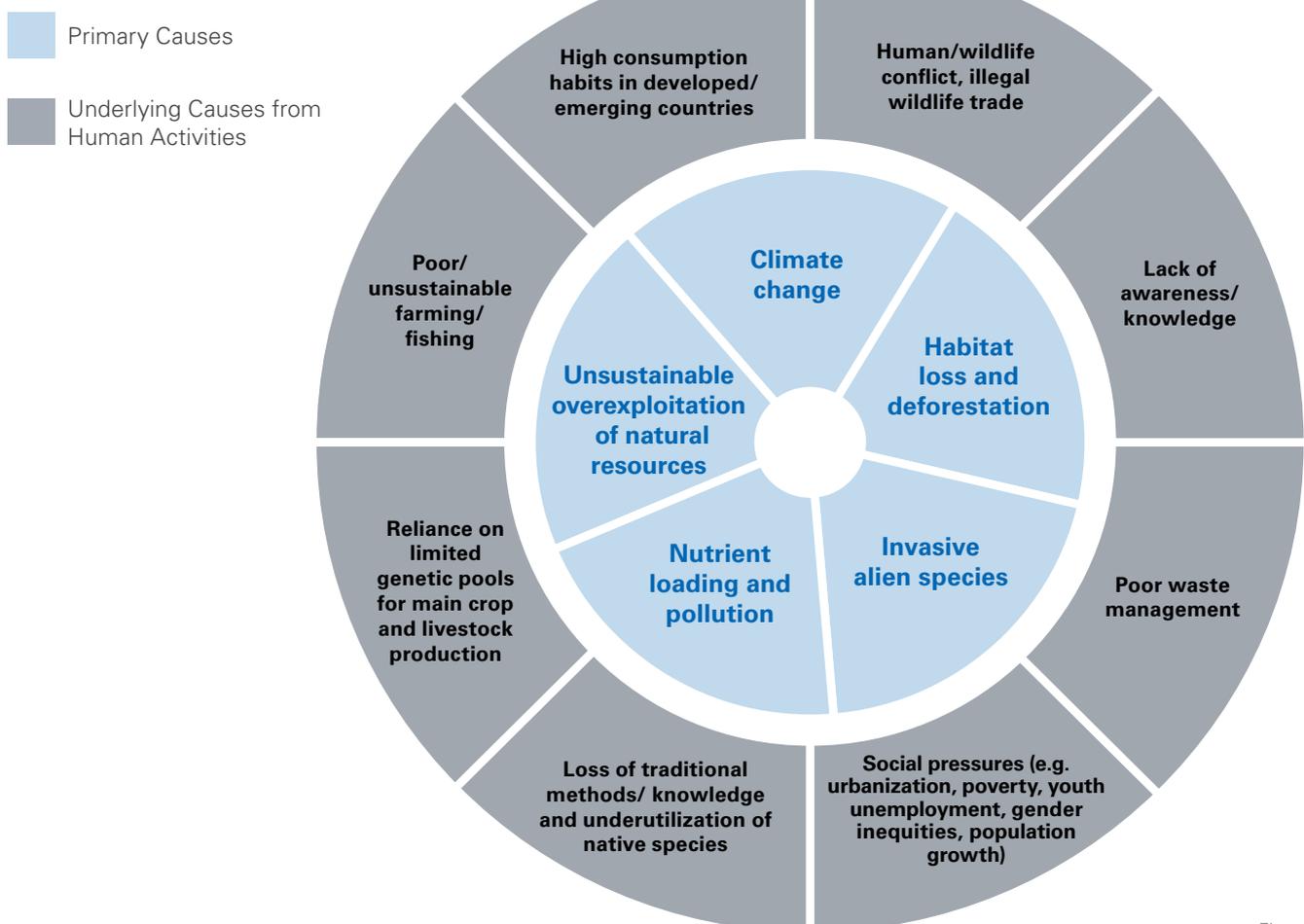


Figure 1



SUSTAINABLE DEVELOPMENT GOALS



Sustainable Synergies

Preserving biodiversity and ecosystem services contributes directly to human well-being and development priorities, creating great synergies between the 20 Global Biodiversity Targets and the Global Sustainable Development Goals. In this report we have linked the SDG icons with projects and findings from the Farming for Biodiversity Solution Search to serve as a visual reminder of their important interconnections.

The Convention on Biological Diversity and its parties identified 20 biodiversity-related targets — The Aichi Targets — to be achieved by 2020. Among them were pledges to sustainably manage areas under agriculture, aquaculture and forestry to ensure biodiversity conservation.

While these targets supported the development of the Sustainable Development Goals (SDGs), current experiences show that a greater emphasis has to be put on the empowerment of local and national leaders to develop, implement and scale solutions. Throughout its most recent Global Biodiversity Outlook²⁷ (GBO-4), the CBD calls for underpinning efforts to protect biodiversity with a better understanding of people and their relationship to the natural world: technical and economic interventions alone will not be sufficient to achieve the Aichi targets or long-term aspirations.

While parties to the Convention are discussing a new biodiversity framework beyond 2020, the depth and breadth of the response to Solution Search: Farming for Biodiversity is a testament to the growing global movement for positive change in behaviors and attitudes toward natural resource conservation and sustainable use.

These local solutions and the leaders behind them bring a face and story to the implementation of the current CBD Strategic Plan as well as other global frameworks such as the SDGs. But they also guide us in considering how a new Post-2020 Biodiversity Framework can empower agents of change and make agriculture work for biodiversity, livelihoods and food security.

What are the Solutions?

Solution Search: Farming for Biodiversity has revealed many game and behavior-changing solutions submitted by people in the field, often community members themselves. The solutions are bringing farming into harmony with the natural environment to protect and increase the biodiversity of surrounding plants, animals, and microbes on the agricultural land itself. They highlight sustainable land use management practices that promote the natural balance and benefits of biodiversity. They promote alternative pest control, fertilization, and waste management to protect water sources and ecosystems. They address human/wildlife

conflicts and put in place livestock control measures to protect both flora and fauna. They bring newfound economic benefits and recognition for traditional varieties, knowledge, and practices. And they celebrate the potential of youth and women farmers to drive change.

The 338 solutions submitted to Farming for Biodiversity contest address the drivers of biodiversity through a combination of technical and socio-economic strategies (Figure 2).

TECHNICAL STRATEGIES



SOCIAL & ECONOMIC STRATEGIES



Figure 2

TECHNICAL STRATEGIES

Because land degradation and fragmentation are at the heart of the habitat loss that threatens biodiversity, most solutions focus on protecting or restoring land, water or forest systems, often in combination. Solutions employ various methods to enhance natural resource management, with an emphasis on organic farming, integrated farming and conservation agriculture to replace the overuse of chemical fertilizers and pesticides, and restore ecosystems. Better control of waste and crop residues are addressed, including turning them into compost, animal feed, or biofuel. Numerous projects engage in tree planting and agroforestry practices, with incentives (e.g., more food production, nutrition, income generation) for local communities to benefit from the sustainable use and preservation of forest systems.

Many innovative technologies are being used to control pests, manage livestock, and address human/wildlife conflicts. For instance, beehives are used as natural barriers to keep elephants out of farmers' fields, and cow urine and garlic spray are used to control invasive crop-destroying caterpillars. Some solutions are combining old and new methods for more effective land management, such as the use of modern algorithms to design livestock grazing plans that mimic the natural balance of traditional animal migrations, and the use of new materials to rebuild ancient pre-Colombian irrigation systems.

SOCIO-ECONOMIC STRATEGIES

To address the human-powered drivers of biodiversity loss, many of the solutions employ strategies that incorporate key social and economic development aspects. Since older generations are often seen as the primary guardians of biodiversity, or "keepers of the seed," they are targeted by programs promoting the traditional ways and intergenerational transfer of indigenous seeds, breeds and knowledge. Women and youth are specifically recognized as agricultural agents of change, with projects offering them leadership and skills development, job creation, and ways to diversify their livelihoods and better value their contributions. Many programs integrate economic incentives to reward methods that preserve biodiversity and bring value addition to their production; for example, partnering with chefs and businesses to use and market traditional and underutilized species as gourmet foods and natural medicines.

Official certifications, (e.g., organic, fair trade™, wildlife friendly) are widely used across projects to improve quality while increasing product value, consumer trust and sustainability. Another strategy applied across various programs and used effectively by the designation of



Land degradation, biodiversity loss, and climate change are three different faces of the same central challenge: the increasingly dangerous impact of our choices on the health of our natural environment. We cannot afford to tackle any one of these three threats in isolation – they each deserve the highest policy priority and must be addressed together.”

– **Sir Robert Watson**, Chair of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (March 2018)

Ambassador or Flagship species works to symbolize an environmental issue or system for campaigns aimed at raising awareness, building pride and changing behaviors.

COMBINING STRATEGIES

In many cases, projects are finding synergies between technical and socio-economic approaches and are therefore applying a mix of both to address the range of issues affecting biodiversity and the sustainability of food production practices. Apis Agribusiness in Ethiopia, the winner of the People's Choice prize, illustrates this concept. The project combines forest management and agroforestry promotion with livelihood diversification, economic incentives, valuation of traditional methods, the use of organic certification for value addition, alternative fuel sources, and engagement of youth to protect rare forest habitats and improve lives for rural communities.

Biodiversity loss is not sectoral, and no single type of solution can mitigate or reverse it. Many of the Solution Search entries are seeking to address more than one challenge. But even in the cases where they are tackling a single primary issue, the answers require multiple layers of activities and incentives targeting a particular community to drive the desired changes in attitude and practice. Such is the case with The Mountain Institute's project in the Peruvian highlands, which won the special Solution Search Side Prize for Water (see page 19).

**People's
Choice
Winner**

Solution Search:
Farming for
Biodiversity



Connecting Bees to Trees to Business Success

Ethiopia's forests are disappearing, leading to a loss of water sources and habitats for plants, animals, and micro-organisms. Causes are linked to high rural unemployment, land grabbing, demand for cash crops (such as coffee), and dependence on wood for rural cooking and energy supply, as well as a lack of effort to engage communities in forest protection.

Apis Agriculture²⁸ is updating the traditional practice of beekeeping in Ethiopia's Oromia State to help reverse deforestation trends, while improving livelihoods among rural communities and tackling the rural youth exodus.

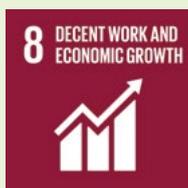
The program trains and mentors unemployed youth in certified organic honey production and business skills, using the latest apiary technologies and an established market for their product, sold at a premium price.

Local Ethiopian youth learn about the critical links between forest conservation and honey production, following the slogan "no tree, no bee, no honey, no money." For each hive given to them, they must plant ten trees, and each youth is expected to train five others in beekeeping. The project has established 50 self-employed young beekeepers, with another 25 in training. It has increased incomes, reduced

youth out-migration, improved livelihoods, and connected youths to formal financial services. More broadly, Apis Agribusiness has spurred changes in attitudes and practices by linking economic incentives to forest preservation and climate change mitigation.

**People's Choice Winner -
Solution Search: Farming
for Biodiversity.**

Also chosen as one of eight solutions to be scaled up through social marketing, technical training, and in country campaigns, with support from Rare and IFOAM-Organics International.



Steps to Success

The Convention on Biological Diversity (CBD) has identified five high-level strategic goals²⁹ for preserving biodiversity:

- A. To address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society.
- B. To reduce direct pressures on biodiversity and promote sustainable use.
- C. To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity.
- D. To enhance the benefits to all from biodiversity and ecosystem services.
- E. To enhance implementation through participatory planning, knowledge management and capacity building.

The steps to success suggested by the Solution Search entries line up closely with these five goals. Indeed, they demonstrate how the Convention's higher-level goals can be implemented on the ground with local communities and regional stakeholders (e.g., government, business, consumers, researchers and investors). Moreover, the projects highlight the, often overlapping, processes needed to lead to sustainable changes.

These success steps, identified by analyzing proven solutions from the bottom up, will aid in the design of a Post-2020 Framework for global biodiversity targets.

1 STARTING AT THE CORE: TRANSFORM PUBLIC THINKING, ATTITUDES AND POLICIES

CBD Goal A:³⁰ **To address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society.**

Boosting social awareness and behavior change

Efforts to stem biodiversity loss must start with the human factor, as so many of the threats to biodiversity are associated with individual or collective behaviors, choices, and demand. Social awareness campaigns may draw on human reason and emotion to build pride in natural assets and tradition, with the goal of educating people on conservation issues to catalyze change in practices and broader social norms. Many successful solutions include outreach to educational institutions and the general public, in programs such as "Junior Guardians of Biodiversity."

As illustrated by an entry from the Wutong Foundation, such programs provide opportunities for children and adults to practice hands-on methods of biodiversity recognition and preservation.

Some of the projects identify Ambassador and Flagship species for use by social marketing campaigns to raise the profile of particular biodiversity risks, leverage support for wider conservation issues, change behaviors, and serve as rallying points to stimulate action. The campaigns capture the imagination of the public and influential policy or decision-makers, working from both emotions and socio-economic considerations. In addition, the designation of flagship species is used to amplify the efforts of understaffed government conservation departments, and help accelerate policy efforts for greater biodiversity protection by garnering public pressure and engagement.

“We need to get people to understand biodiversity in the wild, and in urban areas, and in places they cannot see, like soil microbiology. We must permeate the public mindset with examples and stories that they can grasp in daily life and that will get as many people involved as possible.”

– **David Gould**, Senior Facilitator, IFOAM - Organics International, and Solution Search Technical Judge

Train-the-trainer and other human-to-human approaches create a multiplier effect for spreading skills-building and greater involvement. Such initiatives can represent good returns on investment in terms of personal and social capacity. Results encourage the establishment of local leaders, who spur development and uptake on the ground, and the formation of key influencers, who help promote change across different sectors and levels. Rural extension services also serve as key levers for stimulating changes in attitudes, knowledge, and practices – including those enhanced through digital information services.

Water Impact Winner

Solution Search:
Farming for Biodiversity



3,000-Year-Old Technology for Solving a Modern Climate Change Threat

The high-altitude Andean “puna” grassland ecosystem in Peru supports pastoral livelihoods and water supply, along with unique biodiversity that includes the endangered vicuña (a wild relative of the llama). Puna soils serve as major carbon sinks and as a natural way to capture, store and regulate water flow. But they are drying out due to climate change and the concentration of livestock herds in remaining wet areas.

The Mountain Institute³¹ led participatory action research that supported local farmers in initiating the restoration of ancient pre-Incan canals and reservoirs designed to slow water flow through grasses and soils, for better absorption and as a buffer against floods

and drought. Implementing the solution required layers of technical and social activities to instill the hydrolic and community systems needed to ensure longstanding changes in local water management.

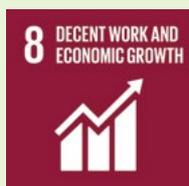
The Mountain Institute engaged youth through targeted outreach and brought in external experts to help communities reconstruct the ancient infrastructure. They used modern green-gray hybrid solutions to improve the system’s functionality during dry seasons and reduce the labor needed for maintenance. In addition, the project strengthened community governance and natural resource capacity through participatory trainings, and the communities developed grassland and water

management plans to safeguard the puna and avoid future community conflicts.

Results have improved water supply and livestock productivity, generating greater food security and economic benefits. Based on the success of this project, The Mountain Institute is replicating it in other highland sites.

Winner Side Prize for Water Impact - Solution Search: Farming for Biodiversity.

Also chosen as one of eight solutions to be scaled up through social marketing, technical training, and in-country campaigns, with support from Rare and IFOAM-Organics.



Institutionalizing biodiversity in public policy and planning

To further mainstream biodiversity across government and society, the projects try to demonstrate their economic and development benefits to policymakers and public-sector actors. The aim is to convince decision-makers of the importance of adopting supportive policies and creating an enabling environment for increasingly normative use of sustainable practices.

As part of this tactic, some Solution Search projects have connected their work with national and regional development or conservation plans. For example, the New Jersey Audubon Society³² is aligned with the Agricultural Smart Growth Plan for New Jersey (USA). Its project to grow black oil sunflower seed in rotation with corn and beans as a niche market product is helping to intensify food production and increase farmers' incomes on limited agricultural land, within a "farming for ecosystems" model. Moreover, the Society is further collaborating with the state of New Jersey to promote conservation by donating revenue from the project to help establish and manage native grassland habitats on State Wildlife Management Areas.

Many projects, ranging from research institutions to small community programs, are collaborating with government partners to instill a greater level of official support and institutionalization for biodiversity preservation. For example, the Sustainable Income Generating Investment Group³³ (SINGI) in Busia, Kenya, has negotiated with local schools and health programs to serve as primary buyers at a negotiated fair price for the African Leafy Vegetables. The project teaches communities to establish vegetable gardens using sustainable agricultural practices featuring indigenous crops that promote both nutrition and biodiversity. SINGI is part of a consortium with members from civil society, private NGOs, and County Government Ministries (Health, Education, Agriculture, and Environment). The partnership developed a draft biodiversity policy framework that was adopted at the county government level to mainstream biodiversity conservation and utilization in various projects and programs.

2

GETTING TO THE PROBLEM: IN REDUCING THREATS, CONTEXT IS KING

CBD Goal B: To reduce direct pressure on biodiversity and promote sustainable use

One of the findings from analysis of the Solution Search entries is the wide variety of ways in which communities are tackling direct and indirect pressures on biodiversity, with initiatives suited to their ecological and economic contexts. For instance, places with lush environments but limited

space are more likely to apply systems with diverse crops for food, feed and sale, and may use a system integrating livestock with crop production. Those with vast stretches of fields may counter the negative impacts of monoculture by rotating production, reducing the use of chemical inputs through organic farming and conservation agriculture, and using land on the edges of fields to create swaths of wild biodiversity. Agroforestry is favored for its multiple benefits in areas where communities have access to forest resources – particularly as an alternative to unsustainable clearing of forests for agriculture, timber or charcoal.

“We are working hand in hand with [rice production] corporations to stop the contamination of our natural resources, since in some areas the [rice] husks are thrown directly into the river, causing sedimentation and flooding. When this happens we blame the Government or the company leaders, but we fail to realize that we are to blame, too, for the problems we complain about during times of flood.”

– **Fernando Rafael Jimenez Osuna**, Asomojasub

Drilling down

The targets of projects range from specific to broad biodiversity risks. For example, among the more narrowly-focused projects, the Action Center for the Environment and Sustainable Solutions³⁴ in Benin is collecting invasive water hyacinth for use as fertilizer in market gardens and for the production of biogas, which has the added benefit of replacing the use of firewood to meet energy needs. Likewise, Biomass Ventures³⁵ is working in Sri Lanka to promote the use of *Gliricidia* – a rapidly growing local tree – for biomass to replace the use of coal. The tree is produced organically and sourced from smallholders. In Colombia, Asomojasub³⁶ is working to reduce water contamination from rice cultivation by transforming the production waste into planks for construction, organic compost, and flour for poultry and pig feed.

Going wide

Many projects are applying broader, more holistic strategies to address a range of problems leading to environmental destruction and habitat loss. Organic production is



City Slickers Tasting the Fruits of Urban Forests

In Hsinchu (Taiwan) and Seattle (US), the Wutong Foundation⁶⁵ has established two urban food forests. Meant to create a perennial landscape and be self-sustaining, they place people in direct contact with the environmental, economic, and social benefits of forest ecosystems. The forests are planted on municipal land through agreements with city agencies. They combine native varieties and non-invasive food-producing

plants (fruit trees, berry bushes, edible perennials) to foster pest control, pollination and habitat for beneficial creatures. The forests also include gardens, ponds, rain water collectors, composting and a public plaza. The program draws on dedicated individuals, who engage others through free tours, tree-planting activities, social media and monthly educational “work parties.” It also involves city agencies and staff, community groups, residents,

schools, universities and others. The forests are improving soil, water and air quality. In addition, they are attracting tourists and effecting the restoration of native species, cooling of urban heat sinks, reduction of runoff, water conservation, increased production of nutritious foods, greater local knowledge, and stronger human connections to nature.



emphasized widely to mitigate the contamination and degradation from chemical fertilizers and pesticides. Obtaining official Organic Certification is used as strategy across numerous projects to access niche markets and higher prices. To make it profitable, projects like Banyan Roots Organics³⁷ in India are helping to link small-scale organic producers to more lucrative markets through supply chain improvements, communal processing and value-addition. Moreover, the use of organic methods is not restricted to rural environments. In Portugal, Cantinho das Aromáticas³⁸ operates a large urban organic farm producing certified herbs and plants. The farm, open to the public for visits and sales, demonstrates the benefits of urban organic agricultural ecosystems. It also showcases indigenous livestock.

Several holistic methods are being applied by contest entrants across vastly different ecosystems, adopting various names and methods. The Balkan Ecology Project³⁹ in Bulgaria is designing biological polyculture systems relying on native ecology rather than external manufactured inputs to produce food, with an open-source policy for its models and records to encourage replication by others. The Africa Centre for Holistic Management⁴⁰ in Zimbabwe integrates livestock in its holistic management system, and has successfully restored soil and perennial grass cover, benefiting from the use of animal manure as fertilizer and the passage of animals' hooves to break up soil for better air and water penetration. Bio Strategies⁴¹ in French Polynesia implements an eco-cultural system that integrates plants, animals and agroforestry, along with a social component of community management and education. Integrated farming combines crops, livestock, pest, land and water management to promote biodiverse and organic agricultural systems. A popular approach, coined integrated farming, is being applied in projects ranging from lush highlands to periurban areas in Costa Rica, Ecuador, Italy, India, Singapore, Honduras, and Zambia.

Agroforestry is another inclusive solution that brings multiple benefits to people and landscapes. Trees, crops and livestock are managed together in a complementary and mutually beneficial system that encourages forest protection (along with its biodiversity) and food production using limited land. Forest products, such as fruits, nuts and medicines, are reaped alongside those from crops and livestock, which often include honeybees. To add further value to agroforestry products, projects such as Reforestamos Mexico⁴² are promoting a zero deforestation labeling for commodities, such as avocado, grown within systems that protect forests and watersheds.

Permaculture, which takes advantage of natural ecological processes by integrating a variety of crops, animals and natural pest controls into one farming system, is used in projects that span the globe. Platanera Río Sixaola⁴³ is implementing permaculture techniques such as bio-corridors and natural fertilizers on banana plantations in Costa Rica. The Ministry of Agriculture's Agricultural Ecology and Resource Protection Station⁴⁴ in China promotes

permaculture techniques like farmland water conservation, efficient cultivation, recycling and re-utilization of waste, as well as intercropping in its demonstration gardens. Manor House Agricultural Centre⁴⁵ in Kenya offers bio-intensive agriculture training, research and extension services. They test ecological solutions on both farms and their own research station, and have successfully completed a five-year project developing conservation agriculture production systems, which restore soil health and create more resilient fields through crop diversification, use of permanent ground cover, and minimization of tillage. (*Manor House has been selected by Rare and IFOAM-Organics International as one of eight training and campaign partners in additional efforts to bring their insights to scale.*)

With communities at the center of risk-reduction approaches, they also play an important role in informing or resetting research and policy agendas to incorporate changing needs, preferences and innovations on the ground. Thus, research projects and institutions are working in close collaboration with communities through participatory methodologies and human-centered design to ensure that solutions are relevant and appropriate at the local level.



SAFEGUARDING BIODIVERSITY: CHAMPION ITS CHAMPIONS

CBD Goal C: To improve the status of biodiversity by safeguarding ecosystems, species, and genetic diversity.

Identify and Preserve

Biodiversity conservation relies on two complementary approaches: *In situ* conservation efforts seek to preserve the natural resources and balances that promote plant, animal and microbial biodiversity in their natural environments. Examples may include nature or marine reserves, biospheres, biocultural heritage trails, conservancies and conservation areas, and conservation agriculture methods. *Ex situ* conservation targets species that are endangered or have disappeared from their native areas. It preserves their genetic stock outside of their natural habitats in places such as zoos, gene banks, botanical gardens and other specialized reserves.

Along with habitat loss, one of the key threats to biodiversity in livestock and food crops is the use of hybridization techniques that affect the vigor of genetic stocks of traditional breeds, in favor of higher-producing ones and greater yields. The need to produce more food per plot or keep more animals per plot must be balanced with the necessity of preserving genetic traits that may protect crops and animals from changing conditions — such as the ability of indigenous breeds to be more resilient to drought, pests and diseases.



Ambassadors for Hearts and Minds

Flagship species, no matter how small, can serve as important ambassadors to capture public sentiment around conservation issues – and promote change. Fazenda Ambiental Fortaleza⁶⁶ is using the Brazilian Bob-o-Link – a bird disappearing due to intense agro-businesses both north and south of the equator – as its symbol for a program promoting permaculture, links to market, water conservation through sustainable coffee production, and protection of clean water sources and wildlife.

In China, the Firefly Conservation Research Center⁶⁷ is using a rare aquatic firefly species as a symbol for more sustainable rice production. The insects are

important bio-indicators of water quality – disappearing when the quality is diminished. The project produces “Firefly Rice” using sustainable methods, attracting higher prices for producers as well as attracting eco-tourism to the area. Results are increasing biodiversity awareness and convincing rice farmers to change their planting practices to reduce their use of harmful chemical pesticides, herbicides and fertilizers.

In South Africa, the Endangered Wildlife Trust’s⁶⁸ *Operation Oxpecker* is re-establishing the Red-billed Oxpecker bird as a natural way to control ticks in livestock and wildlife, eliminating the need for chemical pesticides or toxic home brews. Along with

awareness-raising campaigns, the program has played a catalytic role in the development of a standardized green label for all oxpecker-compatible products, further promoting consumer behavior change and demand for safer tick control products. The Trust also is advocating for the designation of the Sungazer lizard as South Africa’s National Lizard to make it an emblem for protecting the country’s threatened grassland biome. It is using South Africa’s Biodiversity Stewardship approach to promote voluntary agreements with private and communal landowners, municipalities and other government entities to control detrimental grazing and burning.



Celebrating Stewards of Biodiversity

The knowledge and understanding of indigenous varieties and technologies traditionally reside with older generations, often women, and are at risk of being lost. This problem is particularly acute in regions where indigenous populations have disappeared or been pressured to adopt the conventional farming and mainstream cultures. In response, programs to promote biodiversity are ascribing value to traditional knowledge keepers, designating biodiversity champions, establishing intergenerational exchanges, and working with school children to cultivate young stewards of biodiversity. Community-run seed banks and seed networks also are being established to continue the identification, conservation and application of native varieties.

In Mexico, Desarrollo Alternativo e Investigación⁴⁶, winner of the contest's Food Security Side Prize, has trained 75 farmer "champions" as Agrobiodiversity Pollinators. The program uses participatory plant breeding and seed dissemination to reintroduce traditional maize and bean varieties. Organizations and farmers have formed the *Red Maíz Criollo* (Criollo Maize Network), a platform for strengthening local varieties, conducting seed fairs, and undertaking farmer field trials with 50 farmer groups (including 35 womens' groups) to inform research and varietal development. Four women-run seed supplier businesses have been launched, featuring traditional varieties.

The Convention on Biological Diversity calls for ensuring fair and equitable sharing⁴⁷ of the benefits arising out of the use of genetic resources, especially to protect local communities. One of the practices being used by Solution Search projects is the application of free prior and informed consent (FPIC) to formalize agreements between indigenous populations and researchers or projects. FPIC outlines clear working arrangements regarding the gathering and use of native varieties, and the rights and protections pertaining to the use or sharing of traditional knowledge, practices and innovations. Other strategies include conducting applied research with indigenous researchers and community members, and recognizing the importance of giving space in official reports to local names of tribes, people, and native varieties.



CREATING WIN-WINS: SET INCENTIVES AND ECONOMIC RETURNS

CBD Goal D: To enhance the benefits to all from biodiversity and ecosystem services

Costs and returns

Nature provides ecosystem services – such as fresh water, fertile soil, clean air, fish and timber – for free. But the loss of these resources carries tolls and economic costs that are only beginning to be understood. A new report⁴⁸ from the 129-member Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services⁴⁹ (IPBES) suggests that land degradation is negatively impacting the wellbeing of at least 3.2 billion people. The Economics of Ecosystems and Biodiversity⁵⁰ (TEEB) initiative is currently assessing the global costs associated with biodiversity loss – to provide numbers to spur political action. Preliminary⁵¹ TEEB findings suggested that ecosystems and biodiversity have an economic value that is between 10 and 100 times greater than the costs associated with conservation.

While calculations of global biodiversity benefits are critical for fostering high-level policy change, it is the more immediate and personal cost-benefits that are stimulating greater biodiversity stewardship at the community level. Numerous proposed solutions from this contest are finding ways to associate financial incentives and benefits with activities that protect and promote biodiversity, setting a course to ensure both economic and environmental sustainability.

In some cases, the incentives are directly monetary. For example, in Mexico, the Grupo Ecológico Sierra Gorda IAP⁵² is working with the the Council of PRODUCE Foundations and the Ministry of Agriculture's Directorate of Agricultural Development and Productive Innovation to pay smallholder farmers for land-use changes that conserve biodiversity and combat climate change and poverty, using state-level funds from carbon taxes. Bioversity International⁵³ is testing a program to pay farmers directly for biodiversity stewardship of priority indigenous crops in Peru. Participants define which priority varieties to cultivate, what level of reward is required, who will take part, and how payments will be shared. Collaboration with the Peruvian Ministry of the Environment and Ministry of Economics and Finance has ensured government support for the program, leading potentially to the first-ever inclusion of "green public investment projects" in the 2019 Budget Cycle.

Bettering livelihoods with biodiversity

More often, programs are finding ways to diversify and improve livelihoods – particularly among smallholder farmers or herders – using indigenous varieties or biodiversity-friendly production methods, and connecting producers to market value chains for greater earnings. For example, BioConcepts Pune⁵⁴ in India is promoting cottage industries featuring hardy local medicinal plants that are in high demand for ayurvedic medicine, and because they are unpalatable, also serve as buffer crops along farmers' fields against raiding herbivores. The Cameroon Gender



Improving Conditions for Land and People “Under the Canopy”

Unsustainable farming practices like deforestation threaten the biodiversity and watersheds of the Uluguru Mountains in Tanzania. Sustainable Agriculture Tanzania⁶⁹ is creating incentives for farmers to practice agroforestry, forest protection, and more sustainable farming methods. The program combines modules on topics such as agroecological farming methods, leadership training and financial management, using a learning-by-doing approach through

Farmer Field Schools. Project planning is participatory and trainings encourage continued farmer-to-farmer learning. Incentives include payments for carbon sequestration associated with tree planting. In addition, willing participants are walked through the process to become certified organic farmers, giving them access to the favorable prices of the organic market in town. Nearly all participating farmers (95%) have given up slash-and-burn practices; 76

percent report eating a more balanced diet, having added leafy greens, fresh beans and fruits; and 60 percent report an increase in farm production, including the addition of poultry and other farm animals. Through capacity-building in organic farming, leadership training and networking, the farmers are becoming ambassadors of the agroecological movement, speaking at meetings and conferences.



and Environment Watch⁵⁵ is working along the green value chain with an apiculture program promoting the production and sale (locally and internationally) of Oku White Honey and beeswax, creating employment for women and youth, and catalyzing community engagement in the protection and regeneration of the local forest.

Foundation Ressources et Nature (FORENA)⁵⁶ in Mauritius is combining micro-entrepreneurship and conservation of native forest biodiversity with a program targeting women and youth to plant *Moringa oleifera* tree plantations on land previously used for sugarcane. The tree produces oil with multiple nutritional and pharmaceutical uses and leaves that serve as natural pesticides. With business training and organic production, the program is fostering employment and better land management in line with the Strategic Plan of the Ministry of Agro-Industry for the Non-Sugar Sector in Mauritius.

Along with using organic and other official certifications to bring value addition to local products, programs are looking for ways to connect small producers with lucrative markets to ensure fair and sustainable prices. For example, in Nepal, Local Initiatives for Biodiversity, Research, and Development⁵⁷, has developed a “landscape label” that markets local agricultural products based on the tourism appeal of the local area, introducing buyers to niche products to create new demand. The community-based Kenya Organic Oil Farmer’s Association – which has a mixed membership that includes women and youth – has a contractual agreement with Earth Oil Extracts⁵⁸ to produce Organic and “Fair for Life” (a Fair-Trade standard and certification system) tea trees for essential oil extraction. Currently, they have trees covering about 500 acres, and each member has between one to three acres of land on which they grow a mix of food and essential oil crops. Similarly, in China, Fairbiotea⁵⁹ is building connections between engaged tea importers, exporters, and organic tea producers to strengthen market access and returns for the tea farmers.

Palatable solutions

Gastronomy is also a powerful agent of social and economic change, through its promotion of awareness, appreciation, and use of native varieties. Dishes derived from ancestral subsistence crops from indigenous communities are achieving gourmet status, opening the door for farmers to reap higher prices from increased demand.

5

GOING DEEP: CREATE SPACE AND SUPPORT FOR COMMUNITY ENGAGEMENT

CBD Goal E: To enhance implementation through participatory planning, knowledge management and capacity building.

The power of bottom-up approaches

It is clear from the Solution Search: Farming for Biodiversity entries that communities are engines of change for sustainably connecting agriculture and biodiversity. Local people know and use their environment, and given the right resources and incentives, can be among its most important stewards. Moreover, the force of community change can help overcome conventional policies and practices that cater to systems dependent on agro-chemical inputs and fossil fuels for delivering high yields.

Increasingly, programs are using participatory approaches designed to engage communities in decision-making, research agenda-setting, and program activities. Participatory methods aim to increase program success and sustainability. They are effective tools for shaping public policy and accountability, ensuring that program planning is grounded in real issues and adapted to local needs, demands and preferences. For example, much of the success of a community organization program in Nepal developed to combat erosion and slash-and-burn practices can be attributed to community participation and confidence in the initiative. Led by the National Disaster Risk Reduction Center⁶⁰, winner of the Solution Search contest’s “Judges’ Choice” grand prize, the program promotes agro-forestry, climate resilient crops, and sustainable technologies, using locally affordable and accessible technologies. Local communities have been mobilized to operate seven Disaster Management Committees, helping to sustain and institutionalize the project outcomes.

To foster community engagement, programs are identifying and empowering community leadership in efforts to drive widescale adoption of sustainable solutions and institutionalize practices that benefit both communities and the environment. Fundación Ecotop⁶¹ in Bolivia has an innovative program to grant exemplary farmers a university title of Agricultural Technician (cooperating with the Agronomy School of a public university in La Paz), which generates prestige in the communities and gives them greater credibility to interact with policy makers. Many have become local leaders and are strong voices for the “dynamic agroforestry systems” promulgated by the program.



Use It or Lose It

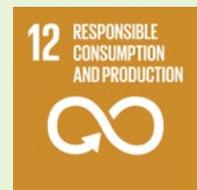
The conservation and preservation of indigenous plants and animals are greatly enhanced by strategies that ensure their continued use and value.

Biotechnology Research Innovations for Development, Growth, and Empowerment of Nigerians⁷⁰ is applying cryopreservation to secure the genetic resources of valuable male African catfish, in collaboration with the *ex situ* genebank and growing ponds of the Ministry of Science and Technology. At the same time, they are scaling up the production and use of cryopreserved sperm

to boost catfish aquaculture in Nigeria. The results aim to reduce national reliance on fish imports and prevent the destruction of indigenous catfish by commercial and smallholder fish farmers.

In Peru, Parque Chalakuy⁷¹ (Maize Park), spearheaded by the the Asociacion para la Naturaleza y el Desarrollo Sostenible, preserves indigenous maize varieties to boost local food systems, agricultural production and indigenous self-determination. The program conserves seeds *in situ* in the high Andes and trains community members on participatory plant

breeding techniques to enhance local capacity and encourage additional conservation and adaptation strategies. To further strengthen indigenous rights and representation, the project works with women on building their capacity for engaging in food security and policy decisions at local, national and international levels. To promote the use of indigenous varieties, the program has established a culinary sanctuary and restaurant (cooperatively managed by the community) to promote traditional dishes and beverages.



Engaging youth

Youth are a critical demographic for efforts targeting farming for biodiversity, especially in developing countries, where they make up the largest segment of the population. However, youth face cultural and practical barriers to accessing land for farming, they are seen as high credit risks by financial institutions, and many associate subsistence farming or herding with poverty. Combined with the lure of a better life perceived to be in cities, which pulls young people away from rural areas, these factors have pushed up the age of the average farmer in the world to 60 years⁶².

The Solution Search entries recognize that the engagement of young people in the business and long-term implications of food production and environmental conservation is essential. Nearly a quarter of the projects specifically listed activities targeting young people and schoolchildren (figure 3).

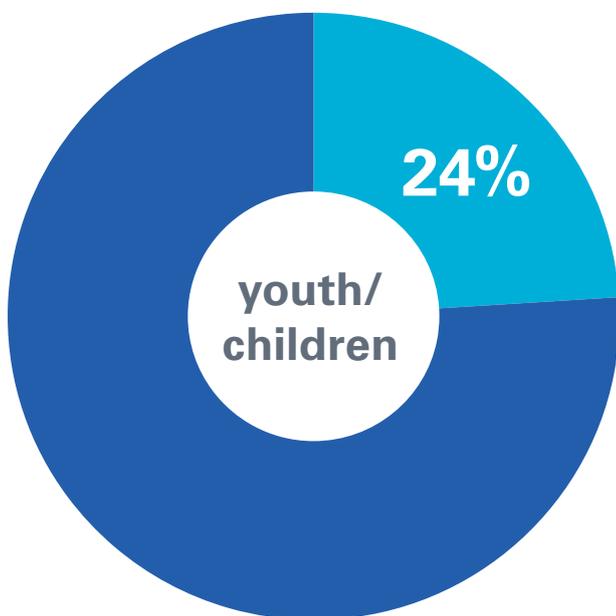


Figure 3: About a quarter of Solution Search entries specifically target youth/children and a third specifically target women.

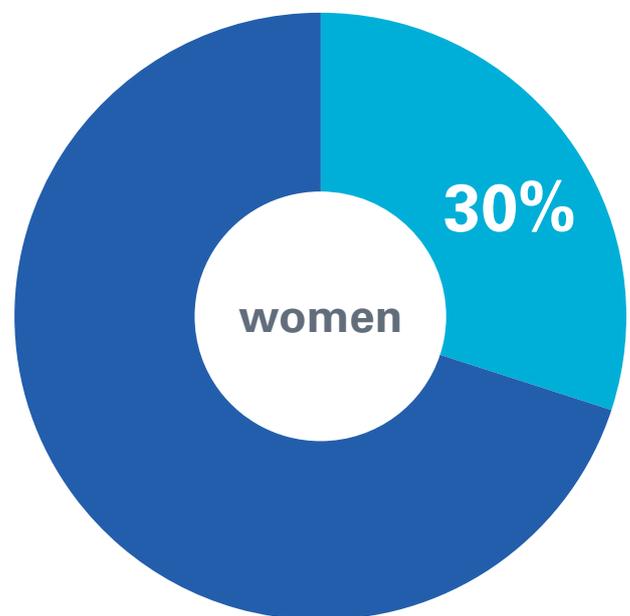
Young people tend to be future-focused and open to change, especially if it is associated with new technologies, digital systems, and a focus on farming or conservation as a business rather than a poor person's occupation. They can also be very engaged as consumers in sustainable food practices. For example, there has been a strong rise in the percentage of respondents between the ages of 15 and 20 who are willing to pay more for products and services that come from companies committed to positive social and environmental impact — rising from 55% in 2014 to 72% in 2015, according to a Nielsen global online study⁶³.

Tapping gender dynamics

Women are identified as target audiences in nearly a third of the Farming for Biodiversity contest submissions, and

in all likelihood are integral participants in more (figure 3). They traditionally hold different labor responsibilities on the farm than men. For example, women may be in charge of weeding or small livestock, while men may take on land preparation and the management of large livestock. Household priorities, decision-making power, knowledge and access to resources (e.g., income, land, financing, training) generally differ along gendered lines, which in turn has a bearing on how women and men manage biodiversity resources. Thus programs must consider the roles and contributions of both women and men, as well as the need to engage men in efforts to promote greater gender equity.

Across many Farming for Biodiversity projects, special efforts are being made to increase employment and income generation for women, through training, sustainable food production, the use of indigenous varieties, and greater



linkages to value market chains. Gender roles within households and communities are being considered more thoughtfully in projects aiming to increase family income, nutrition, and engagement in conservation practices.

Like the Convention on Biological Diversity and the Sustainable Development Goals, the contest submissions link gender equity with poverty alleviation, biodiversity conservation and sustainable development. They are helping to translate the Convention's 2015-2020 Gender Plan of Action⁶⁴ into tangible frameworks that can serve as examples for fomenting the transformative changes with the potential to improve lives for women, men and communities.

Top Ten Finalist

Solution Search:
Farming for Biodiversity



Targeting the Belly to Change Minds and Livelihoods

A burgeoning Latin American food movement is creating new opportunities for traditional farmers and their crops. In response, Familia de la Tierra⁷² in Colombia is working to protect the tropical, montane Páramo ecosystems — which contains more than 3,500 endemic species — while ensuring higher prices for local farmers through the organic production, transformation and commercialization of Andean ancestral foods. The program has recovered 10 varieties of native potatoes, now grown sustainably, and helped producers to aggregate and commercialize their crops for production as

colorful and nutritious potato chips. It has succeeded in negotiating a fair and agreed price and quantity with the buyers, ensuring that the farmers reap 50 percent of their crops' value addition. In addition, the program has identified 20 restaurants interested in featuring the native potatoes on their menus.

In Ecuador, CanopyBridge-EcoDecision⁷³ is linking sustainable indigenous farming with high-end chefs and niche markets to preserve the rich diversity of traditional foods. In collaboration with conservation NGOs, the project is developing

value chains for Amazon fresh foods that have substantial conservation benefits and great culinary potential. Through the establishment of a distribution chain from the Amazon to Quito, these products are now reaching specialty food markets and restaurants on a weekly basis.

CanopyBridge-EcoDecision was chosen as one of eight solutions to be scaled up through social marketing, technical training, and in-country campaigns with support from Rare and IFOAM-Organics.



Conclusion

While global conventions provide an essential framework for tackling global challenges like biodiversity loss, local solutions and leadership are essential for the realization of such global commitments. They can inspire change not only at the local level, but also at national and international levels, by helping define policies, research needs and funding priorities.

This report offers recommendations for informing the post-2020 Convention on Biodiversity agenda and inspiring the replication of solutions that can contribute to achieving its aims. They address a variety of audiences, from donors, policymakers and researchers to consumers, the business community, program planners and local communities.

RECOMMENDATIONS FOR ACTION

1. Funding, Investment and Business Sector Partners

- Promote and celebrate community solutions and leaders with funding to support tested initiatives, proof of concept, and new technologies and innovations for community-based and community-driven programs.
- Work in tandem or partnership with governments, investors and fellow business community members to fund incentives (e.g., blended finance models, 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.
- Highlight solutions through rewards, scholarships, networks, mentoring programs, social marketing campaigns, 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.
- Support scaling of proven local solutions horizontally and vertically through behavioral change trainings, policies and other incentives for transformative change.
- Invest in and empower indigenous communities, youth and women as agents of change in biodiversity conservation and agricultural/economic development.
- Review practices within your own operations to ensure they are in line with sustainable behaviors. Such behaviors include: suitable sustainable agricultural practices adapted to context (permaculture, bio-intensive, organic), soil, water and ecosystem protection, sustainable use of

biodiversity such as indigenous or traditional varieties, promotion of sustainable food consumption, reduction of food waste, and promotion of gender equity and indigenous rights).

- For guidance on relevant documents and frameworks, see for example the CBD Secretary General's note on mainstreaming biodiversity across sectors.⁷⁴
- Take a cross-sectoral approach in planning and use the "Guidance on agriculture, crop and livestock"⁷⁵ of the Cancun declaration on mainstreaming the conservation and sustainable use of biodiversity for well-being when addressing biodiversity and food systems.

“Land degradation is rarely, if ever, the result of a single cause and can thus only be addressed through the simultaneous and coordinated use of diverse policy instruments and responses at the institutional, governance, community and individual levels.”

– Remedial Options⁸⁸ from the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services

2. Policymakers

- 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 policymakers 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

Community Impact Winner

Solution Search:
Farming for
Biodiversity



Building Community to Repair Fractured Land

In Borneo, forests are disappearing, and the land is being depleted due to population pressures and the unsustainable use of a slash-and-burn agricultural model. Fairventures Worldwide⁸⁹ and the Borneo Institute have launched a joint project called 1 Million Trees, which is revitalizing the forest, land and livelihoods of farmers in Central Kalimantan, Indonesia. They are introducing multi-species agroforestry, with fast-growing timber for income generation and fruits

and vegetables as sources of nutrition. The approach is designed to generate enough income to replace mining, illegal logging, and conversion to palm oil plantations. It also addresses the need to function in areas with poor soil, follow government regulations, and be implemented by farmers with little disposable income. The program has established local nurseries, and offers an intensive program on best practices for agro-forestry and financial and organizational skills building. Results include

increased incomes for participating farmers (surpassing the Indonesian average, much less that of this poorer region), improved consumption of fresh fruits and vegetables, increased biodiversity, decreased erosion, cleaner water, and increased resilience to climate change. A key factor of success has been the strong focus on community engagement and feedback, based on Free Prior and Informed Consent standards.



such as REDD+, the Sustainable Development Goals, the Paris Climate Accord, the Cancun Declaration on Mainstreaming the Conservation and Sustainable Use of Biodiversity for Well-being, 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 large-scale palm oil plantations, monoculture, overproduction, high use of chemical fertilizers/ pesticides).
- Strengthen agricultural advisory services and establish farmer-to-farmer learning programs to scale up and scale out sustainable innovations, and to demonstrate that biodiversity and increased food production can, and must, be compatible.

3. Researchers and Program Planners

- Empower local leaders and solutions through shared capacity-strengthening, recognition and collaboration.
- 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 and recognize indigenous knowledge and 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 – outline 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.

4. 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.

- Be aware that guidance for sustainable consumption can take many forms – from well-known, third-party certified labels to participatory guarantee systems⁷⁶.
- 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.

5. Communities

- Increase awareness of farming for biodiversity solutions, and promote behavior changes that increase biodiversity stewardship, learning from each other and scaling up bright spots.
- 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 the adoption of methods that reduce risks to biodiversity and the environment, and 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.

WHAT'S NEXT FOR FARMING FOR BIODIVERSITY?

The solutions elicited by this project are now featured on a dedicated portal called PANORAMA⁷⁷ that is co-hosted by Rare, GIZ, and IFOAM - Organics International. There is also space for individuals and groups to contribute their own solutions.

Portal access: <https://panorama.solutions/fr/portail/agriculture-and-biodiversity>



Weaving the Way to Progress with Traditional Reeds

In Sri Lanka, wetland biodiversity is threatened, as is rice farming on tiny plots that have become economically unsustainable. Farmers have sought employment elsewhere, with youth leaving rural areas and women looking for jobs as garment workers in urban areas or as domestic workers abroad. The Rush & Reed Conservation and Diversification Programme⁹⁰ has reintroduced traditional reed farming and weaving to restore wetlands, revitalize marginalized micro-farms, and provide income

generation for women and youth by targeting niche markets. The program has introduced organic reed plots in rice fields, with edible and medicinal plants placed around the edges to increase biodiversity, food and income generation. It also has reintroduced traditional rice varieties, high in nutrition and market value, using organic cultivation. The program is tapping the knowledge of older women, who maintain traditional reed weaving skills to make eco-friendly products

that have become fashionable and in demand. The women are engaged as trainers, sharing their skills with younger men and women. Outreach to schools is also aimed at revaluing traditional knowledge and changing behaviors to promote biodiversity conservation. Water, soil and biodiversity have been regenerated, incomes have increased by as much as 60 percent, and the program is being adapted to suit drier zones.



In 2018, the Farming for Biodiversity initiative embarked on a new phase. Eight initiatives from the crowdsourcing contest were selected to be scaled up in-country and regionally, based on their levels of innovation and scalability potential. They include:

Manor House Agricultural Center, Kenya⁷⁸

Spreading bio-intensive agriculture techniques among smallholder farmers to increase resilience to climate-change and conserve soils

Desarrollo Alternativo e Investigación, Mexico⁷⁹

Promoting traditional maize and bean varieties and increasing yields through participatory seed distribution networks

CanopyBridge – EcoDecision, Ecuador⁸⁰

Linking top chefs to indigenous communities in order to promote indigenous sustainable foods

National Disaster Reduction Center, Nepal⁸¹

Promoting climate-smart cash crops for adaptation and economic benefits

Apis Agribusiness, Ethiopia⁸²

Using organic honey production to fight youth unemployment, migration and deforestation

A Growing Culture, Vietnam⁸³

Introducing living Bio-Beds for pigs to create a circular economy while reducing waste run-off into river ways

Centre d'Actions pour l'Environnement et le Développement Durable, Benin⁸⁴

Turning invasive water hyacinths into organic compost to minimize negative impact on waterways and create small income opportunities

The Mountain Institute, Peru⁸⁵

Reviving pre-Incan waterways to stem climate challenges and make livestock farming sustainable

Solution Search partners are conducting social marketing and technical trainings designed to equip local champions with the behavior change insights and practical agricultural expertise to take these solutions to the next level. See Rare's Campaigning for Conservation Programme⁸⁶ to learn more about the approach taken.

In addition, the Solution Search project is working closely with FAO, the Convention on Biological Diversity, and more than 30 partners⁸⁷ working on agriculture and land use to ensure that lessons learned from the implementation and scaling-up of these promising projects are taken up in policy and practice.



Following the Lead of Farmer-Driven Solutions

In a region where the use of agro-chemicals and hybrid rice is deeply implanted, the Zarraga Integrated Diversified Organic Farmers Association⁹¹ (ZIDOFA) in the Philippines employs a farmer-driven solution that uses an organic system of rice intensification for growing traditional rice varieties that reduces chemical and water input. The system uses 50 percent less water, 90 percent fewer seeds, and increases yields by 30 percent, because plants develop substantial root architectures. The fields sequester more carbon and are more climate change resistant, as the plants are better able to survive floods, droughts and strong typhoons. The central strength of the project has been rooted in behavior and attitude changes among committed farmers, who are now breaking a vicious cycle of debt and dependence on chemical inputs.



Farming For Biodiversity - Partners

POWER IN PARTNERSHIPS

The project is driven by a global alliance of organizations aiming for more sustainable land use and agriculture. Rare teamed up with IFOAM – Organics International as Implementing Partners to combine our expertise in behavior design and social marketing with IFOAM’s role as a global leader in organic farming. The German Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety (BMU) supports the project through the International Climate Initiative.



Convention on
Biological Diversity

Supported by:



Federal Ministry
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The initiative would not have been possible without our partners and advisors.



Endnotes

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