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Soil to Sky: Climate Solutions that Work



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About this report

This report aggregates research on the use of grassroots solutions in addressing climate change. It was prepared by California Environmental Associates at the request of the CLIMA Fund (Climate Leaders in Movement Action), which is a collaboration between the Global Greengrants Fund, Grassroots International, Thousand Currents, and the Urgent Action Fund for Women's Human Rights. The CLIMA Fund helps large funders directly reach grassroots organizations and social movements that are working at the intersection of climate mitigation, climate resilience, and human rights. GRAIN and the Indigenous Environmental Network also provided critical writing and research. The intended audience for this report is the full range of grantmakers and actors working to address climate change; the recommendations included in this report are not designed for any particular actor and, in fact, would necessarily need to be undertaken by many different actors in order to achieve optimal impact.

This report was developed through extended desk research during the fall of 2018. We reviewed dozens of publications and drew from a broad set of data sources. The authors are solely responsible for the report's content, including any errors. We extend our warmest gratitude to the CLIMA Fund partners for their materials, support, and insights during this process.

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ON BEHALF OF



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Currents**



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Executive summary

Despite the best efforts of advocates and communities around the world, the most recent Intergovernmental Panel on Climate Change (IPCC) report suggests we remain on a path toward 4°C of warming by 2100 and all of the devastation that entails—both human and ecological. Over the last 20 years, larger funders have collectively focused heavily on shifting national policies, reforming industry sectors, developing new technologies, jump-starting carbon trading markets, and transforming global energy production. In pursuit of leverage and our fear of climate catastrophe, these funders have prioritized scale above all else. And in doing so, the funder community has largely missed significant opportunities deemed too small or too dispersed to matter. Not only are grassroots community-focused grants important globally from a mitigation perspective, but they are also essential in building the longer-term political base for the climate movement and increasing the effectiveness of mitigation, adaptation, resilience, and economic-transition strategies. Grassroots climate funding needs to become a significantly larger share of the portfolio of interventions philanthropy pursues if we hope to succeed.

Grassroots solutions are those led by communities local to the problems they seek to solve, rather than those led by international policy or corporate actors. They are led by communities instead of industry leaders, institutional environmental NGOs, and academic panelists. They require working at a local scale that has often been considered out of reach for large, international philanthropies. Furthermore, they are perceived as being riskier, harder to measure, and labor-intensive. While these factors make grassroots solutions difficult investments to justify on a one-off basis for large funders, the evidence shows that these approaches ultimately yield the most success in the stated aims of global climate philanthropies: reducing emissions, promoting alternatives, securing human rights, improving public health, increasing global education, and ensuring community resiliency in the face of a changing world. Given the limited investment so far by climate philanthropies, the evidence suggest that grassroots solutions have a high potential for even greater and more rapid results with additional support.

This report outlines why climate-change funders should consider incorporating grassroots solutions into their portfolios. It examines two foundational strategies—movement-building and gender equity—and four types of grassroots solutions that have been underexplored and underfunded by major climate funders. The solutions have significant emissions reductions potential and create economic empowerment, advance public health, and improve human rights for all. The solutions are agroecology, community governance of renewables, direct resistance to resource extraction, and Indigenous Peoples as frontline defenders. This report is not an exhaustive examination of the types of solutions that can be employed, but rather an example of overlooked opportunities.

Finally, this report introduces a mechanism for institutional climate funders to implement these strategies. Through its thousands of locally grounded, internationally connected partner organizations, the CLIMA Fund is a bridge to grassroots climate work that incorporates an equity and justice lens. The grantee partners of the CLIMA Fund are advancing solutions that address the underlying drivers of climate change and build resilience in communities worldwide through recognizing the leadership of women, youth, Indigenous Peoples, small-scale farmers, and Afro-descendant communities. These solutions are critical, yet largely underexplored, pathways for addressing climate change among U.S. and European funders. To overcome the shared global challenge of climate change, and to advance human rights and global resiliency, funders will need to incorporate grassroots climate movement-building support into their portfolios.

Union of Organizations of the
Sierra Juarez of Oaxaca, Mexico
Agroecology

Introduction

Introduction



The indicators of climate change are already here, with carbon dioxide levels at 37 percent higher than pre-industrial levels and increasing by 0.7 percent per year, global temperatures up 1.8°F since 1880, and sea levels rising almost 7 inches over the last 100 years.¹ The impacts of climate change are already visible, from tens of thousands of climate refugees to eroding coastlines, and the loss of both ecosystems and livelihoods. Economies are growing faster than our ability to reduce the associated emissions, which are still within the boundaries of what could be considered “business as usual,” and which would mean catastrophic impacts to the planet and its communities. Philanthropy has an outsized role to play in shifting this trajectory, given the competing incentives of industry and governments.

Despite the urgency, climate change receives only 1 percent of philanthropic funding from U.S. foundations.² This is a dangerously myopic distribution given the wide-ranging consequences of rampant climate change. The limited philanthropic funds available for climate mitigation have primarily focused on the most direct mitigation wedges—namely energy, industry, and transportation policies. These strategies have focused on the major emitting countries and regions with the hope that tackling the largest slices first will add up to global significance. In pursuing that top-down strategy, philanthropy has largely ignored localized opportunities under the assumption that they do not have impact that will scale.

Beyond just missing opportunities to address climate change through grassroots efforts, institutional climate funders have undercut their ability to address the root causes of climate change by not supporting groups that are challenging traditional power structures. Many mitigation-funding strategies tend to enable wealthy communities to continue to pollute, while placing the burden of action on those already suffering the impacts (see examples in Chapter 4: Indigenous Peoples as Frontline Defenders). Solely partnering with governments, businesses, and large NGOs means that mitigation strategies do not redistribute power towards those that are hardest hit. The voices of those impacted hold knowledge and intellectual diversity that are essential to sustaining habitable life on earth.

There is increasing recognition that the strategies currently being pursued by institutional philanthropy are not sufficient. Many of institutional philanthropy’s largest investments (e.g., U.S. climate policy) have seen devastating setbacks, in part because they have not been connected to the people most impacted by the climate crisis. New research has identified a need for philanthropy to tackle more of the basic drivers of climate change, including our extractive economy and human rights abuses.³ Many of these areas, which have aggregate greenhouse gas mitigation potentials similar to leading strategies at the center of climate funders’ agendas, have enormous benefits in other areas, such as climate change adaptation, gender equality, economic development, human rights, and public health. Thus, these strategies inherently address multiple priorities for global funders.



We call these strategies **“grassroots climate solutions.”** They are solutions that move systems toward equity through networks rooted in the power of the people; are the result of principled, collective, and direct action; create targeted pressure; and are born out of the communities in which they operate. These community-based solutions are essential to achieving a low-carbon, equitable world.

Indigenous Peoples, small-scale farmers, women, and youth working in and as movements advance grassroots climate solutions. Recognizing women’s leadership and advancing gender equity is especially important to optimize the potential impact of grassroots climate solutions, because women are some of those hardest hit and are often closest to changing ecologies (e.g., agriculture). Movement building helps to broaden the political base for advancing effective climate policy, build the self-determination of impacted communities, and increase public will and awareness—all of which are crucial for creating systemic change. Recognizing women’s leadership secures the rights of those on the frontlines of climate change and harnesses their expertise as traditional knowledge holders, crisis responders, and community decision makers.

Grassroots climate solutions vary significantly across geography and sector, but include certain similar characteristics:



ADDRESS
ROOT CAUSES



ARE LED BY
COMMUNITIES



BUILD
LOCAL RESILIENCE



ARE
PLACE-BASED



ELEVATE FRONTLINE
LEADERSHIP



ADVANCE
HUMAN RIGHTS

- **They address the root causes of climate change.** These strategies move the needle on the key drivers of climate change, including resource consumption and land-use change. One measure of success for these strategies is a reduction in emissions against a business-as-usual scenario.
- **They are led by communities.** For these strategies to be successful and sustainable, they must be led by impacted communities. These include Indigenous communities as well as organizations endogenous to the place of operation that have buy-in from and are accountable to local stakeholders. Local leadership and focus on community issues means that they work independently of international and national politics, and thus don’t depend on the outcome of national elections or political trends.
- **They develop local resilience.** Responding to climate change requires communities to be able to react and adapt to changing circumstances. These strategies improve the ability of local communities to manage new circumstances through local governance and control of natural resources. These solutions strengthen communities’ political power, adaptive capacity, ability to respond to variations in climate over time, and capability to transition their systems and institutions to excel in emerging clean economies.⁴
- **They are specific to a place.** Grassroots climate solutions may have common characteristics globally, but are unique to specific geographies, communities, landscapes, and ecosystems. Because the impacts of climate change are place-based, their solutions must also be customized to locales to maximize effectiveness and local buy-in, which help ensure success.
- **They elevate and emphasize the leadership of frontline impacted populations.** Recognizing the leadership and wisdom of those that have experienced systems of oppression increases overall human and environmental well-being. For example, historically marginalized populations, such as women, youth, and Indigenous Peoples, have significant power to decrease deforestation when in positions of leadership and when their rights to land and territory are respected. As those closest to the problem, these peoples can assess and mount interventions that address the root causes of climate change, rather than merely temporary mitigation or adaptation fixes. Furthermore, more diverse leadership in the climate movement leads to more diverse knowledge, ideas, and options, resulting in better and more resilient solutions.
- **They advance human rights priorities.** By tackling climate change through lenses such as health and gender equity, grassroots solutions more effectively tie climate action to broader development goals. Providing solutions to impacts of climate change, such as increased frequency of extreme climatic events and drought, also helps to support human rights, such as rights to food, water, health, and sustainable local livelihoods.



Why have grassroots solutions been overlooked by climate funders?

1. **They are time-consuming and labor-intensive for philanthropy.** Most funders do not have the relationships, time, or capacity to meaningfully connect with grassroots work. In part, these barriers are due to the work's decentralized nature, cultural differences, and the administrative challenges associated with issuing and monitoring numerous small grants. Currently, only 1 percent of international giving from U.S. foundations is for general support to local organizations.⁵ The majority of grants supporting organizations addressing climate change are larger than \$50,000.⁶ Some philanthropies perceive the due diligence required on smaller grants too labor intensive to pursue.
2. **Funders are risk-averse and tend to fund what they know.** The funders' lack of familiarity with grassroots work and communities creates uncertainty relative to mainstream environmental and policy nonprofits. The emerging emphasis on diversity, equity, and inclusion (DEI) in the philanthropic community is now shining a light on how siloed the environmental-funder community is.⁷
3. **Success can be less clear-cut and more difficult to measure.** The dispersed and long-term nature of these solutions generally makes it more difficult to derive short-term quantitative success metrics or extrapolate outcomes trans-locally. For funders that prioritize numeric and short-term outcomes, incremental, siloed solutions are valued over systemic, holistic solutions from the grassroots. In addition, foundations' measures have often been designed without consideration of the reality and proposals of actors and communities on the ground.
4. **Grassroots work can be perceived as not "scalable," "efficient," or "effective."**⁸ On the contrary, grassroots organizations are more efficient and effective at their work because they are not bureaucracies that have trouble reaching their target constituencies. These often scrappy organizations can do much more work on relatively small grants than large, international NGOs can do with the same amount of money. The community-based nature of these organizations creates greater trust among other local groups, and quickly leads to scale through network and coalition building. Moreover, developments in technology and the growing interconnectedness throughout the world are now breaking down the local/global dichotomy, making community-based efforts more easily transferable, although in a way that is different from the cut-and-paste scalability funders are familiar with.

Grassroots solutions are supported by two foundational strategies: movement building and gender equity.



Movement building is executed by interconnected, strategically aligned organizations and groups, including Indigenous Peoples, women, and youth, that attempt to shift power and change culture. Funding movement building means providing resources and support to community-led organizations across the globe that are calling for immediate and ambitious climate action and providing the bottom-up pressure necessary to implement emissions reductions at scale. This also means supporting grassroots organizations whose mission is not directly tied to the climate movement, but whose work yields emissions reductions and resilience building (e.g., advancing women's empowerment).



Recognizing women's leadership and advancing gender equity is not often framed as a climate change issue but is crucial to success, in part due to the disproportionate impacts of climate change on women and their ability to provide outsized emissions reductions, as well as the key roles that women play in defending Mother Earth.⁹ Advancing women's rights means women have agency to make decisions for themselves, their families, and their communities. Beyond the climate change benefits, advancing women's rights and equity is integral to human development—studies have shown that empowering women advances both human development indicators and measures of democracy. As a foundational climate strategy, advancing women's leadership and gender equity are necessary for the success of grassroots solutions such as agroecology, Indigenous land rights, and resistance to extractive industries.



The Via Campesina,
South Africa
Movement Building

Examples of grassroots climate solutions

There are many examples of grassroots climate solutions; this report explores several that are particularly compelling. These solutions are well-studied examples of ways to reduce greenhouse gas (GHG) emissions and build resilience to climate change through bottom-up strategies. Each solution is summarized below and explored in greater detail in the remainder of the report.

Agroecology



Agroecology is a practice, science, and movement that uses ecological concepts and principles in the design and management of sustainable agricultural ecosystems in which manufactured, external inputs are replaced by natural processes. It empowers

local communities by leveraging traditional knowledge, local seed production, local consumption of food, and crop diversification. Along with significant yield and resilience benefits, agroecology is believed to have the potential to mitigate 390 to 490 gigatons of CO₂e (carbon dioxide equivalent) by 2050 through practices such as the elimination of fertilizer use, improved soil management, implementation of co-generation systems, and decreased transportation emissions.

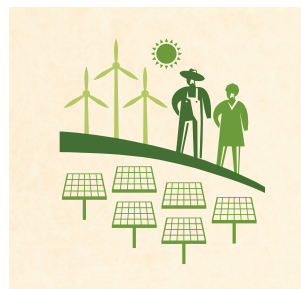
Direct resistance to resource extraction



Direct resistance to resource extraction advances not only a climate change agenda, but also public health and economic and political empowerment. Places dependent on resource extraction often suffer from both Resource

Curse economies ¹⁰ (having a wealth of natural resources but also less economic growth, a weaker democracy, and worse development outcomes) and poor public health indicators. From a climate perspective, preventing a 1.5°+ future requires a moratorium on new fossil fuel development. Often, communities directly affected by fossil fuel extraction, transportation, and processing are some of the most committed opponents of fossil fuel development, and strongly favor the introduction of clean economic opportunities and energy alternatives.

Community renewables



Community governance of renewables emphasizes replacing centralized fossil fuel production with local control of renewable energy. This has the potential to simultaneously reduce emissions from fossil fuel production to the tune of 250 gigatons of CO₂e

by 2050, improve resilience by providing a decentralized system more able to respond to shocks, and return control of energy resources to those with the greatest stake in ensuring sustainable and just distribution. Local control over production and distribution of energy resources allows communities to optimize how energy is used relevant to their place.

Indigenous Peoples as frontline defenders





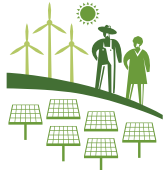





Ensuring and strengthening the rights of Indigenous Peoples is a human rights issue. Many studies have shown that land managed by Indigenous Peoples with strong land tenure has significantly lower rates of deforestation than land under

other governance systems, including protected areas. Studies also show that carbon pricing mechanisms, such as REDD+¹¹, compromise and harm Indigenous cultures, their relationship to their land, and carbon mitigation outcomes. Strengthening indigenous peoples' tenure of lands and forests they already manage can ensure the protection of 200 gigatons of CO₂e stored in standing forests, and prevent 850 gigatons of carbon dioxide from entering the atmosphere. Expanding Indigenous land rights onto lands where Indigenous Peoples already informally manage the land can prevent additional deforestation, resulting in the reduction of another 6 gigatons of CO₂e by 2050.

Greenhouse gas estimates

Figure 1 aggregates our estimates of the size of carbon pools—reservoirs of carbon that can absorb carbon—that each grassroots strategy in this report explores. Rather than using specific numbers, which may imply a false sense of certainty about the size of the carbon pool at stake, we instead are presenting carbon pools as rounded, cumulative estimates between 2018 and 2050. Individual sections dedicated to each of the strategies explore these estimates with more nuance, and each section cites literature and analysis that has been used to develop these estimates.

Figure 1: **Carbon pools that grassroots strategies address**

Strategy		Emissions reductions mechanism	C Pool by 2050 (GT CO ₂ e)	Roughly equivalent to
		Eliminating synthetic fertilizers, increasing local food consumption, implementing silvopasture, etc.	490	Emissions from China by 2050
		Reaching 100 percent global renewable energy	250	9 years of global energy emissions
		Keeping fossil fuels in the ground; eliminating emissions from resource extraction	1,300	Standing stock of all global forests
		Strengthening property rights on lands already managed by Indigenous Peoples; expanding land managed by Indigenous Peoples	200	Emissions from the U.S. by 2050

Estimating emissions reductions from grassroots climate solutions is admittedly tricky, which is one of the reasons why grassroots movements have been hesitant to use them. We attempt to estimate the full greenhouse gas potential of these strategies in this report, but in doing so make a number of assumptions.

First, we assume in our calculations that each of these strategies is adopted fully and globally. In the case of supply-side fossil fuel development, for example, production is likely to be displaced to other geographies unless production is stopped everywhere more or less simultaneously. Of course, any specific grant cannot address the full nature of these issues, and some attempts to address these issues will fail, but nonetheless it is important to estimate what is at stake with regards to each strategy. There is also value in adoption of these strategies, even on a limited scale, in building the foundation for a just transition from a fossil fuel-dependent economy to one based on equity and sustainable livelihoods.

Second, many of these solutions are complementary and overlapping; for example, agroecology and keeping fossil fuels in the ground assume that fewer fuels will be burned than in a “business-as-usual” case. Our estimates for both of these strategies count only the emissions benefits of the strategy itself. In this way, our attempts to quantify the **emissions benefits are not additive**, but rather should be considered as stand-alone boundary estimates for the magnitude of carbon at stake.

Rural Women's Support Network of
West Africa and Chad, Burkina Faso
Women's Leadership

Foundational strategies

Movement building



If the people who are most affected by climate change impacts have the power to organize political, social, and economic institutions to prioritize climate and community outcomes—or create their own institutions to achieve those aims—communities would then have significantly more ability to both cut emissions and increase their resilience in the face of climate impacts. Movements that include Indigenous Peoples, small-scale farmers, women, and youth—intrepidly organizing in communities and internationally—are what build that political power. Increasing self-determination rather than advancing top-down reforms is the crux of personal and community resilience. And through the work of organizing, communities develop the relationships and social cohesion so critical for responding to climate disasters.¹²

The fundamental shifts in priorities, power, and social norms that can result from movements inherently create multi-issue benefits, such as in public health and education.¹³ Through movements, the voices of marginalized communities can be amplified to influence decision-making bodies, which is particularly important in contexts where these voices are not typically represented and decisions ultimately affect their lives and livelihoods.

Climate change funders have, in the name of scale and efficiency, largely focused on top-down international, national, and corporate strategies to set targets and install instruments to reach those targets. As can be seen with the failure of national climate policy in the United States, the absence of enforcement mechanisms in the Paris Accord, and the failure of Nationally Determined Contributions to fall within a 1.5° scenario, traditional funder approaches to climate action have not succeeded. Top-down climate strategies continue to fail due to a lack of political accountability and a failure to address the root causes of climate disruption. Politicians and governments have followed a path of political expediency, entering into and discarding already weak climate commitments without consequence, as the U.S. has done with the Paris Accord. By contrast, civil-society movements are calling for much greater ambition on emissions reductions and economic transformation than political and corporate leaders are willing to enact. Barring this political will, funders will need to invest quickly and significantly in the infrastructure of climate movements to push for the social change needed to address the gravity of the climate crisis.¹⁴



Black Fraternal Organization of Honduras (OFRANEH), Honduras
Movement Building

A keystone component of movement building is the development of networks, alliances, and coalitions that provide an opportunity to broaden the tent of those advocating for climate change policy to include adjacent sectors such as health, faith, and education. Resourcing grassroots and community-based organizations can help build the public support needed to create lasting political will for climate strategies and initiatives. This broader base can put pressure on state and corporate actors to reduce emissions, and guarantee the political resiliency and enforcement of useful national and international climate policies when they are enacted. As recent research shows, only 3.5 percent of a population is needed to push governments to adopt demanded action.¹⁵ Movements directly build the political power of frontline communities to participate in the realization of their own objectives, which are often more aligned with ecologically sustainable and equitable practices than the objectives of policymakers and industry. The leverage and pressure of well-resourced social movements are necessary for any of the above grassroots strategies to scale and succeed in their efforts to change our global energy matrix, food production, land use, and forest protection. Movement infrastructure and organizing enable such strategies to move from isolated good ideas to game-changing global trends.

Movement building is often underfunded because of the cognitive dissonance associated with a desire to secure an incremental win “now,” as opposed to investing in solutions that can provide systemic shifts in the long run, and the difficulty of attributing movement wins to a particular grantee organization. Corporations with opposing interests often utilize their money and power to suppress community organizing.¹⁶ At times this has threatened and taken—in the case of the 297 documented murders of environmental activists in 2017—the lives of movement leaders, discouraging future organizing.



Oaxacan criole corn,
Mexico
Movement building

Case Study: Sin Maíz No Hay País

In 2009, Mexico began issuing permits for biotech firms such as Monsanto and Syngenta to plant genetically modified (GM) corn in the country. When the first GM seeds were planted in 2011, local farmers and organizations identified this as a threat to Mexico's tradition of seed exchanges and seed banks. Even the farmers who didn't participate reported that GM seed drift from neighboring farms was cross-contaminating their native corn. The stakes were catastrophic: There are more than 59 native varieties of corn, and local corn production and seed collection supports small-scale farming and food security across the country. In response, 73 organizations came together to create an opposition movement under the banner of the *Sin Maíz No Hay País* coalition. Although the biotech firms employed international and top national law firms, the *Sin Maíz No Hay País* coalition, using a pro bono legal team, was able to win an indefinite ban on GM corn in the country from a judge, citing uncertainty about human and environmental health as the primary reason.

Recognizing women's leadership and promoting gender equity



Women are some of the first and worst impacted by climate change, due to structural sexism. Yet, women are not just victims, as is often portrayed in policy spaces;¹⁷ they are powerful agents of change as caretakers of family, land, seeds, and waterways.¹⁸ Achieving gender equity would directly confront the patriarchal social structures that have generated or are complicit in climate injustices. As gendered impacts of climate change influence the strategies and outcomes of the grassroots solutions outlined above, understanding and then integrating a gender lens into grantmaking is an imperative. Effective philanthropy must support work that ensures women have access to decision-making power, technology, and the human rights necessary to face disproportionate climate impacts and develop solutions. Gender equity means women have autonomy over their livelihoods, health, education, and reproductive rights.

The impacts of climate change include massive desertification and changing ecosystems. As a result, women are walking longer distances to access water and find fuel sources, experiencing heightened sexual violence during climate disasters, and sacrificing their education to care for increasingly ill family members.¹⁹ For example, sociocultural and institutional sexism means women and girls have less access to nutrition and medicine in geographies with rapidly increasing diseases and resource scarcity on account of climate change.²⁰ Overall, climate change is an impact multiplier of existing inequities. For example, women often work the lowest-wage jobs, which can be the first and worst hit by climate disasters (such as hospitality), and women suffer from significantly increased sexual violence in refugee camps.²¹

Despite these data, funders do not often support women's movements because of both perceived and real barriers around the costliness and efficiency of grantmaking in women's rights. Gender equity, despite its direct relevance to tackling the climate crisis, is vastly underfunded, with only 0.02 percent of global philanthropy supporting women's climate change solutions.²²



Yet, around the world, women are at the forefront of community struggles and social movements defending the planet. They are increasingly coming under attack for this activism—criminalized, threatened, assaulted, and even assassinated for their resistance. Indigenous women in particular are at risk due to their marginalization, proximity to remaining natural lands, and historical lack of political legitimacy and access.

Women are often those most urgently advancing work that mitigates climate emissions. For example, the Women's Earth and Climate Action Network (WECAN), a global network of women fighting climate change, launched an Indigenous Women's Divestment Delegation which, after extensive advocacy around Free Prior and Informed Consent policies, forced DNB bank to sell the \$2.5 billion line of credit it had in the Dakota Access Pipeline. WECAN also uplifts Indigenous women's voices at the UN Framework Convention on Climate Change, including presenting on Indigenous women-led resistance of extractive industries in Morocco in 2016 and in Germany in 2017.²³

Women are critical first responders to climate impacts, and leaders in building their communities' resilience in the face of uncertain futures. For example, women are often some of the first to establish community-based relief after major climate disasters. In Puerto Rico, a network of local grassroots groups run primarily by women, Centros de Apoyo Mutuo, uses a variety of strategies to build resilience and just recovery, such as peoples' kitchens, food sovereignty through collective gardens and farms, decentralized community-controlled energy (see Chapter 2: Community Governance of Renewables), and more.²⁴

Gender equity must be included in the strategies and organizations climate funders support, as it is an integral part of each of the grassroots solutions above. For example, because women farm the majority of land in developing countries, they are leading the global movement for agroecology. Because women are among those whom climate change impacts the most, they are leading efforts to shut down fossil fuel industries and promote community renewables. Thus, to support the success of grassroots climate solutions, funders will not only need to support rights-based climate work that addresses inequitable gendered climate impacts, but they also need to work with organizations that are focused on women's leadership.



Case Study: Mayan women beekeepers

Land and water in Mexico are being threatened by energy companies, infrastructure projects, and mining corporations, which is compounding the effects of climate change. As gender roles are clearly defined in their culture, women are often the sole caretakers of land and food. Yet, women are rarely in decision-making roles to steward the protection of land to which they are connected. For example, a grassroots group of Mayan women beekeepers was being impacted by the agribusiness company Monsanto, whose genetically modified soybean pesticides were killing bees, polluting local water, and contaminating the women's honey—a chief export to the United States and Europe and a key source of revenue in their traditional economy. Globally, agricultural activity, including pesticide use, accounts for over half of greenhouse gas emissions, with some pesticide fumigants being 300 times more potent than carbon dioxide. These harmful pesticides were compromising the beekeepers' livelihoods and making their families ill. Backed by the Mexican government, Monsanto was a powerful entity in an arena in which the women don't typically have a voice; however, a small grant supported the beekeepers to mobilize, increasing their political power at local, regional, and national levels. Ultimately, the beekeepers' activism led to a lawsuit and Supreme Court ruling against Monsanto and its toxic agricultural practices.²⁵

A photograph of two women standing outdoors in front of a steep, lush green hillside. The woman on the left is wearing a red shirt and a white shawl with red and green vertical stripes. The woman on the right is wearing a green short-sleeved shirt with a red and white striped collar. A white building with a dark roof is partially visible on the right. The background is a dense, green hillside.

DESMI (Organization for Social and Economic Development of Indigenous Mexicans), Mexico
Agroecology

Highlighted solutions

“Food has not been the focus of climate change discussions as much as it should have been ... We can still act and it won’t be too late.”²⁶

— Barack Obama

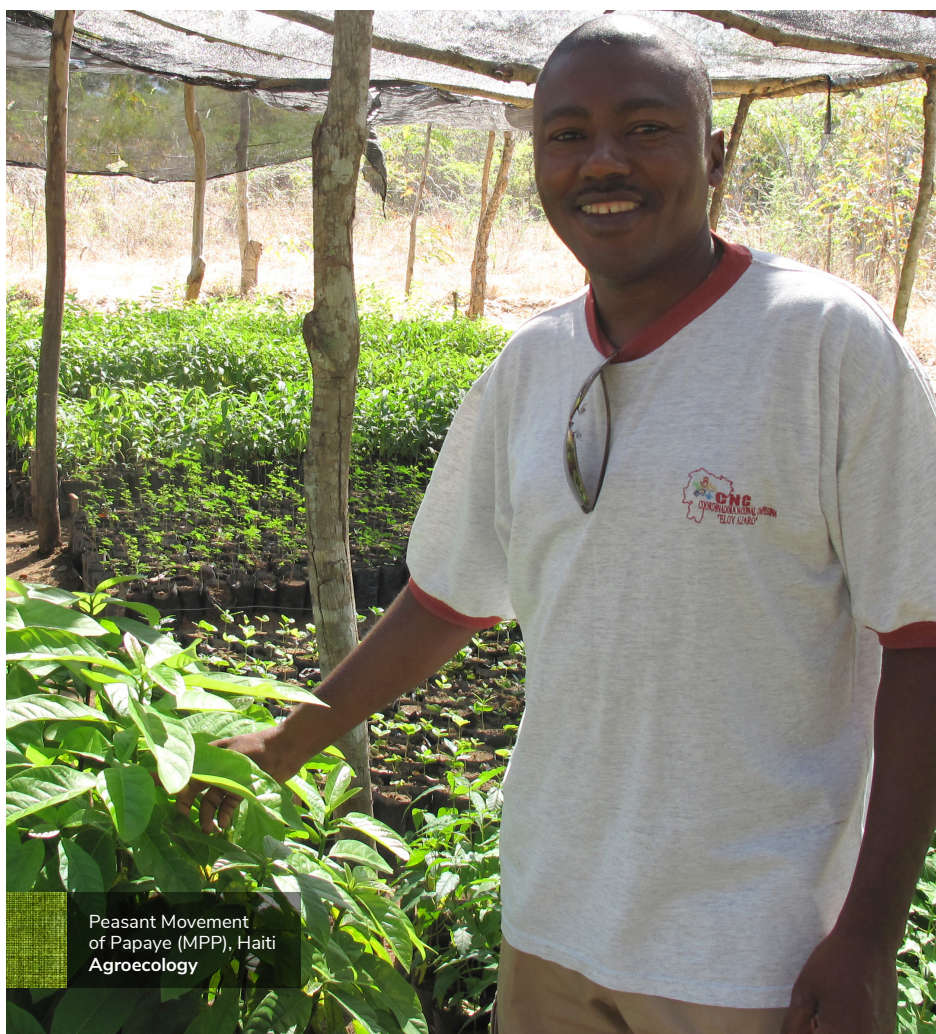
Agroecology



Agriculture is a critical element of the climate crisis—depending on how it is done, it can either contribute to the problem or to the solution. Studies estimate that our current food system is responsible for 30-50 percent of global GHG emissions.^{27, 28, 29} Agriculture is supposed to be the process of turning the energy provided by the sun into food and fiber. However, since the industrialization of agriculture began, food production started emitting much more carbon dioxide due to reliance on fossil energy for activities such as producing chemical fertilizers and pesticides, running tractors, and pumping water for irrigation. The use of nitrogen fertilizers on soils produces another potent greenhouse gas: nitrous oxide. And the gases originating from the bellies of cattle and from the manure lagoons that accompany factory farming contain yet another one: methane.

Agroecology is a practice, science, and movement that uses ecological concepts and principles in the design and management of sustainable agricultural ecosystems in which manufactured, external inputs are replaced by natural processes. It values the knowledge and practices of traditional farming systems as inherently resilient due to their long tenure of successful implementation, during which they have withstood changes in climate and environment. It is also community oriented, empowering local populations and allowing for a local food system that shortens the food supply chain and increases self-sufficiency. This self-reliance includes reducing the need for external inputs such as seeds, fertilizers, and machinery. While the concept was initially developed in Latin America, it is now rapidly growing in popularity and implementation across the world—north and south.

Agroecology is now rapidly gaining formal and institutional acceptance as a potential strategy to deal with two intertwined crises: food and climate. In the past few years, the UN Food and Agriculture Organization (FAO) has hosted a series of international and regional meetings on agroecology, and created an “agroecology knowledge hub” to promote its implementation across the world.³⁰ Graziano da Silva, head of FAO, summarized it this way: “We need to promote a transformative change in the way that we produce and consume food. We need to put forward sustainable food systems that offer healthy and nutritious food, and also preserve the environment. Agroecology can offer several contributions to this process.”³¹



Peasant Movement of Papaye (MPP), Haiti
Agroecology

Olivier de Schutter, then the UN Special Rapporteur on the Right to Food, went even a step further when presenting the report “Agro-ecology and the right to food” before the UN Human Rights Council in 2011: “Based on an extensive review of recent scientific literature, the report demonstrates that agroecology, if sufficiently supported, can double food production in entire regions within 10 years while mitigating climate change and alleviating rural poverty.”³²

Agroecology directly mitigates the emissions from our food system in the following ways:

Natural soil building and fertilization methods: Industrial monocropping uses chemical nitrogen fertilizers that are produced from fossil fuels and emit nitrous oxides when applied to fields. Agroecology substitutes synthetic fertilizers with natural soil building and fertilization methods, and small-scale farming reduces the need for fossil fuel-based machinery.

Leaving forests intact: Deforestation and land use change generate one-fifth of global GHG emissions. The expansion of agricultural production into forests and other natural areas, often for monoculture crops such as palm oil, soybean, and sugarcane, is behind 80 percent of the world’s deforestation. Agroecology integrates agroforestry and silvopasture, leaving forests intact, and restores organic matter on arable land. The integration of crops and livestock creates circular ecological flows and eliminates the need for large concentrated livestock rearing and the related animal-feed commodity plantations, which are both often linked to deforestation.

Shortens the food supply chain: Transport of food makes up 5-6 percent of global emissions.³³ Crops for animal feed may be grown in Argentina, fed to chickens in Chile, exported to China for processing, and eventually eaten in a McDonald’s in the U.S. Agroecology builds local food systems that shorten the food supply chain and reduce food miles.

Emphasizes local markets: Processing and packaging transform foods into ready-made meals, snacks, and beverages. The continuous refrigeration of foods and the packaging process contributes 10-14 percent of GHG emissions. Agroecology emphasizes local markets that source from small-holder farmers, which provide 80 percent of food in nonindustrialized countries.



Practices used in agroecology include diversification of resources and methodology, natural soil management and conservation, and leveraging traditional knowledge. Techniques such as polycultures, intercropping, and agroforestry are used to diversify farming practices, improving yields and strengthening the resilience of the farming system to pathogens or climatic events.³⁴ Agroecology also provides means for soil management independent of exogenous resources, through the use of green manures and mulching. Together, the benefits of these practices increase organic matter in soil, improve nutrient cycling, reduce runoff and erosion, and increase microclimatic amelioration, among other benefits. Building back organic matter and fertility into the world’s soils, impoverished and eroded by decades of excessive use of agrochemicals and chemical fertilizers in many parts of the world, has a powerful implication in terms of the fight against climate change, as organic matter consists mainly of carbon.

Agroecology



Agroecology is more than just improving farming practices. It can transform our global food system. Agroecology prioritizes decentralized, local markets, which reduces GHG emissions from the global transport of food and animal feed. It promotes fresh produce and local indigenous food-processing techniques. It involves shifting

consumption patterns away from hyper-processed food with too much fat, salt, and sugar content, and reduced consumption of meat and dairy. With proper policies in place, a focus on agroecology and small-scale farming allows for productive farming with less machinery that requires fossil fuels. And it keeps more people in rural areas making a living from the land, and thus avoids the further buildup of increasingly unsustainable, huge, urban metropolises. Current initiatives to promote a global transformation toward agroecology-based food systems are being driven largely from the bottom up by civil society, social movements, and supporting organizations. It is critical to ensure that agroecology can continue to be implemented under the control of millions of small-scale farmers and Indigenous Peoples across the world.



Agroecology as a grassroots climate solution



ADDRESS
ROOT CAUSES

- Sequesters carbon through crops with standing carbon stock (i.e., trees), and by increasing organic matter in the soil through regenerative farming practices.
- Implements low-carbon farm practices such as the elimination of synthetic fertilizers.



ARE PLACE-BASED

- Emphasizes the growing, eating, and preserving of culturally relevant crops.



ARE LED BY
COMMUNITIES

- Relies on the governance of local communities, not multinational corporations.
- Gives more political power to local institutions (town and city councils, district authorities, etc.) to help create and promote local agroecological food systems.



ELEVATE FRONTLINE
LEADERSHIP

- Relies on and gives voice to traditional knowledge of Indigenous Peoples and other local communities.



BUILD
LOCAL RESILIENCE

- Saves, multiplies, shares, and stores seeds locally. Eliminates the need for external inputs, such as pesticides, chemical fertilizers, and machinery.
- Reduces water use, waste, and pollution. Ensures soil health through regenerative soil practices.



ADVANCE
HUMAN RIGHTS

- Is a movement, which means it is centered on the leadership and power of impacted communities, such as peasants, pastoralists, and fisherfolk. Is part of and linked with the strategic objectives of other movements, such as food sovereignty, women's, and Indigenous rights movements.

Agroecology:

Greenhouse gas (GHG) potential

Agriculture has the potential to serve as a significant global carbon sink.³⁵ As much as 22.4 to 29.1 GT CO₂e (gigatons carbon dioxide equivalent) is produced annually through components of the industrial agricultural supply chain, including fertilizer, soil carbon loss, and transportation, which could be mitigated through the adoption of agroecological practices.³⁶ If agroecology was pursued to build back the organic-matter levels in soil to preindustrial levels, 24-30% of global emissions would be avoided, or 12.2 to 15.3 GT CO₂e (around what China emits annually).³⁷ Because agroecology encompasses a suite of practices that could be incorporated more or less independently (i.e., the adoption of one practice does not necessarily mean the adoption of other practices), a few selected agroecological practices with high GHG mitigation potential are highlighted below. These practices are by no means fully encompassing of agroecology, but rather highlight a primary group of practices.

Eliminating synthetic fertilizers

The elimination of the use of synthetic fertilizers, the application of which globally accounts for approximately **480 MT CO₂e (metric tons carbon dioxide equivalent)** annually, is a central practice in agroecology as compared with industrial agriculture, which applies fertilizer en masse. The largest share of these emissions comes from China, India, and the United States, which have the highest application rate of synthetic fertilizers in the world.³⁸ An additional **160 MT CO₂e** could be reduced by eliminating the production of fertilizer in China alone, where coal is used as a feedstock, and equipment is largely outdated and inefficient.³⁹

Beyond these practices, additional agroecological practices such as adding compost and manure to soils could further increase carbon sequestration of the soils.⁴⁰

Reducing transportation and storage

The consumption of locally produced, seasonal food reduces the need for both transportation of food and extended refrigeration of nonseasonal crops. Combined, transportation and refrigeration of food will amount to emissions of **1.8 gigatons of CO₂e annually by 2020, totaling 57.6 gigatons by 2050.**⁴¹ While agroecological principles will not completely eliminate the need for food transportation and refrigeration, these emission sources could be significantly reduced through the eating of local, seasonal products.

Extending silvopasture

Silvopasture, or the raising of livestock, particularly cattle, in partially or fully wooded areas as opposed to open grasslands, presents a significant opportunity to sequester more carbon on landscapes. In fact, studies show that allowing trees to grow on grasslands where ruminants are grazing more than makes up for the methane emitted by the livestock.⁴² As such, the GHG mitigation estimate for implementing silvopasture on all grazing land is **31.2 gigatons of CO₂e by 2050.**⁴³

Agroecology:

Knowledge gaps

Agroecology encompasses a large number of practices; only a few with high GHG mitigation potential are considered here. The estimates presented here assume full global adoption on geographically eligible land, which ignores social, economic, or cultural constraints on adoption. Within the estimates, calculations vary significantly due to scientific uncertainty around GHG emissions reductions as well as methodological assumptions. Within estimation methodology, estimates vary significantly based on assumptions such as spillover effects and the end year of adoption. In general, Project Drawdown's projections until 2050 are higher than other estimates supported in the literature, but they assume downstream GHG effects such as regenerated soil quality, which estimates from other literature do not adequately quantify.

Agroecology:

Co-benefits outside of climate

Implementing agroecological farming methods allows for a number of co-benefits. Agroecology produces more and better food, keeps people on the land, and prevents displacement to overpopulated and under-resourced urban areas.

First, it provides local and healthy, organic food, oftentimes to populations that would not otherwise have such access. It also champions biological and cultural diversity in a number of ways, from ownership, cropping systems, landscapes, and biological organizations to community practices and traditions.⁴⁶ There are societal benefits in the opportunities it provides for families and communities to engage in the production of their own food, strengthening the community's ties and connection to food. The good soil practices also ensure that the land is able to produce quality food for generations, without the addition of external fertilizers. In addition, agroecological farming, which often takes the shape of small-scale farming, is often a strong boost to local economies. These co-benefits increase the likelihood that communities will be interested in adopting or maintaining agroecology. They also create opportunities for non-climate funders to support these initiatives.

Another benefit is that as more small farmers are driven off of the land, they are forced to migrate to cities, adding significant strain on economic systems. Often, those cities are in areas threatened by climate disruption from intensified storms. Also, women have played a key role in seed saving for generations, which is at the heart of agroecology, so it lifts up and engages women's knowledge and leadership.

Agroecology:

Cost of inaction

If agroecological principles are not expanded, the consequences would vary from local to global levels. At global levels, land will continue to be used and acquired for large-scale agricultural practices, often including monocultural practices and incorporating fertilizer and pesticide use. Locally, communities will continue to be disenfranchised by the food system, largely due to market pressures that incentivize cash-crop production and land grabs from agribusiness. If support is not provided for agroecology, it will be more difficult for local populations to have access to traditional and culturally relevant food items, which would likely be pushed aside to make room for cash-crop production. As a result, community members will lose out on the strengthening of community and the associated sociopolitical benefits that agroecology brings.⁴⁷ Beyond that, even, many will be forced off the land without other livelihoods, exacerbating many problems identified above.

Grassroots expertise on agroecology

In February 2015, civil-society actors from around the world gathered in the Nyéléni Centre in Mali to agree on a common framework and action plan at the **International Forum for Agroecology**. Together, peasants, farmers, Indigenous Peoples, pastoralists, fisherfolk, women, urban agroecology activists, and others worked to articulate their vision of agroecology. Below, we highlight some quotes from grassroots leaders participating in the Forum, as captured in a video about the Forum⁴⁴ and summarized in an article for *Farming Matters* magazine.⁴⁵

"Agroecology is what can help us to have always in mind that organic is not only technique, but also a tool to change our society ... to change the market to reconnect the citizens to the farmers, the urban to the rural."

— Andrea Ferrante, European Coordination of La Vía Campesina, from Italy

"The important thing is that agroecology is not a top-down model; it's a model that should be developed from the bottom up, which counts the most."

— Renaldo Chingore, UNAC (União Nacional de Agricultores Campesinos), from Mozambique

"Indigenous Peoples have a holistic way of seeing agriculture or hunting and gathering. It includes spirituality, it includes growing food, it includes knowing the seeds. If you put agroecology in the middle, in the nucleus, then that involves all of those aspects of life, community, family, friends, everything."

— Nicole Yanes, Opata Nation, International Indian Treaty Council, from Mexico

Agroecology: Prior efforts



National Peasant Movement of
Papaye Congress (MPNKP), Haiti
Agroecology

Successful implementation

Agroforestry, water management, and organic agriculture in Haiti

For over 40 years, the Mouvmman Peyizan Papay (MPP—Peasant Movement of Papaye) has been bringing communities together around a vision and practice of Haitian self-determination, based on connection with the land and protection of the environment. With a clear analysis of climate change and the consequences it brings for Haiti—which is already environmentally devastated by deforestation—MPP works to recover the environment so peasant farmers can produce enough healthy food to feed the nation. MPP has 61,000 members divided into 4,179 *gwoupman*.⁴⁸ Within MPP, the *gwoupman* share land, engage in economic projects, and save money through collective savings accounts and livestock. Additionally, many families have tire gardens, an MPP innovation that conserves water and allows people to grow vegetables in areas (like Hinche) where there is little rainfall. Through its agroforestry work, MPP has planted over 50 million trees, many of which are fruit trees and contribute to communities' food sovereignty, while addressing the problem of deforestation and preventing erosion. This work is part of MPP's overall work of agroecology, including soil conservation, saving and disseminating Creole seeds for organic vegetable production, distributing and caring for livestock, and a "complete water management" program. This program includes purification and reuse of "greywater" from baths, showers, and dishwashing for irrigation as well as for raising fish. MPP also hosts training sessions for its members and other organizations across the country at its Lakay (Training Center) in the Central Plateau. This training includes technical skills as well as the political education necessary to engage in collective analysis around the root causes of the challenges to achieving food sovereignty and Haitian self-determination, and to develop unity around community-based solutions. Through this combination of interconnected approaches, MPP's work to advance agroecology is a key way that the organization contributes to developing resilience to climate impacts while building a movement and cooling the planet.



Photo © Cotton farming, Wiki-Commons

Failed top-down strategy

Bt cotton in India

In 2002, Monsanto introduced genetically modified cotton seed varieties that contained the *Bacillus thuringiensis* (Bt) pesticide to Indian cotton growers. The company claimed that these seeds improved resistance to certain pests and would increase resilience, yield, and profits for farmers. Since their introduction, the yields for farms using the Bt cottons seeds have plateaued. This intervention runs counter to the principles of agroecology in that it both introduced a pesticide product into the land and introduced a reliance on foreign inputs (in this case, seeds). In India, Monsanto's Bt cotton seeds proved beneficial for some farmers, particularly large-scale farms with access to irrigation water. However, 65 percent of cotton in India is grown on farms without access to irrigation. Research has shown that dependence on the pesticides and the increased price of the seeds actually increase the chance of bankruptcy for these farmers.⁴⁹ Researchers tied this increase in risk of bankruptcy to exacerbation of the farmer suicide epidemic in India, asserting that the increased risk of bankruptcy in turn increased the rate of suicide for the farmers growing 65 percent of India's cotton. By not considering small-holder farmers—who grow a significant majority of cotton in India—when creating and distributing Bt cotton in India, Monsanto created a crisis that not only hurt cotton production more than it helped it, but also disrupted and ended local lives, livelihoods, and communities.⁵⁰

Agroecology:

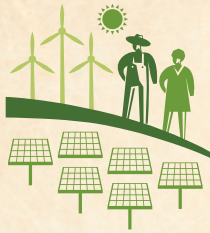
Threats to success

Agroecology is threatened by the commercialization of agriculture as a trend, which leads to monocropping and use of synthetic fertilizers along with other practices that have high carbon emissions relative to the equivalent agroecological practices. Large funders have invested in versions of so-called “climate-smart agriculture” that in practice often increase agroindustrial practices such as monocropping and fertilizer use, creating negative environmental, societal, and public health consequences. The commercialization of agriculture also consolidates ownership of land into the hands of a few, prioritizing their interests over the needs of the community and often over the mitigation of and adaptation to climate changes. This consolidation can sometimes occur through coercive or even violent land grabs. Both of these threats are particularly prominent in the Southern Hemisphere.



Landless Workers' Movement (MST), Brazil
Agroecology

Community governance of renewables



To ensure a future with a stable climate, we must transition away from fossil fuels and to renewable energy. But not all renewables are created equal; decentralized energy systems bolster local resilience during disasters by preventing reliance on a single, fallible source. They also allow communities to prioritize the distribution to the areas that they deem most

important, and can prevent the negative impacts that come from grid-scale generation: displacement of people; large-scale environmental degradation; and reliance on external, economic actors. Large-scale energy projects, including solar, generally consolidate control over clean energy—and, by extension, all of the benefits that energy can bring with it—to a few, furthering systems of disenfranchisement and disempowerment among the users of the energy. Beyond this, they also have worse environmental impacts due to their scale and the resources required to transmit the mass-produced energy over long distances. In this way, community access to renewables is not just about getting to 100 percent renewables, which is already a focus of the climate movement, but about ensuring that the governance of those resources remains at the community level.



Photo © Solar panel, Pixabay.com

Community access to renewables as a grassroots climate solution



ADDRESS
ROOT CAUSES

- Renewables provide low-carbon alternatives to fossil fuel development.



ARE PLACE-BASED

- Because energy production happens locally, renewables must be generated using local, geophysical resources, which are inherently more sustainable than relying on a globalized supply chain.



ARE LED BY
COMMUNITIES

- Retained community governance over renewables ensures that the placement of infrastructure does not disrupt communities.
- Distribution of energy can remain aligned with community priorities.



ELEVATE FRONTLINE
LEADERSHIP

- Community access to renewables can allow Indigenous Peoples and other local communities to gain access to electricity without relying on larger grid systems.
- Local renewables, particularly solar, have been shown to empower women by providing leadership and financing opportunities.



BUILD
LOCAL RESILIENCE

- Decentralized energy grids provide more resilience during natural disasters, as they can remain functional after storms.
- Community energy production insulates communities from exogenous price fluctuations.



ADVANCE
HUMAN RIGHTS

- Community access to renewables is ultimately a development issue: a right to clean energy.

Community governance of renewables:

Greenhouse gas (GHG) reduction potential

There have been many attempts to estimate the GHG emissions potential of decarbonizing global energy production. The most significant emissions reductions from scaling up renewables come from BRICS countries (Brazil, Russia, India, China, and South Africa) and developed grid systems in North America and Europe.⁵¹ Project Drawdown's estimates for emissions reductions from the electricity-generation sector are at **246 gigatons by 2050**.⁵² This assumes an aggressive, but systematic, rise in renewable energy.

Community governance of renewables:

Knowledge gaps

While emissions benefits from renewables are well-modeled, several technological innovations, including utility-scale storage, are crucial to both large-scale and small-scale application but have yet to be commercialized. We do not know whether technological advancements will match what is needed to ensure a 1.5°C future. Furthermore, proliferating renewables in communities in Organization for Economic Co-operation and Development (OECD) countries will depend significantly on the price of renewables technologies and the regulatory environment.

Community governance of renewables:

Co-Benefits outside of climate

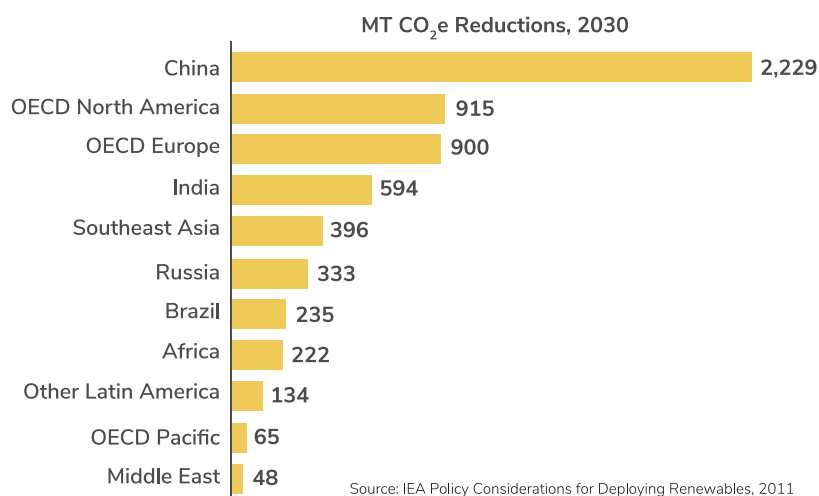
Community access to renewables can result in income generation, lower energy bills for individuals, improvement of local economies via job creation, and opportunities for new community businesses.⁵³ Also known as energy democracy, community control of energy systems enables users to make their own decisions about what is healthy for their community and strengthens local-level resilience to climate impacts that can compromise centralized energy systems (e.g., disasters). It also contributes to community empowerment and pride.⁵⁴ Energy independence allows communities to build internal capacity and rely less on external entities, such as private companies or the government, which can gouge prices and limit access.⁵⁵

Community governance of renewables:

Cost of inaction

Failing to decentralize energy production comes at the risk of large-scale grid failures, millions of deaths from air pollution caused by burning fossil fuels, and a lack of energy sovereignty. In the case of large-scale grid failures, there are real economic costs estimated at between \$18 billion and \$33 billion per year in the United States alone, and outages due to weather globally are projected to increase under climate change.⁵⁶ Community renewable-energy projects would help prevent domino failures during natural disasters, which are typical with large-scale energy systems, and make restoration easier.⁵⁷

Figure 2: Emissions reductions potential of adopting 100 percent renewables



Community governance of renewables:

Prior efforts



Successful implementation

Decentralized solar energy, self-determination, and community power in Puerto Rico

After Hurricane Maria hit Puerto Rico in 2017, communities all over the island were left without electricity and water, and many homes and farms were damaged. Without U.S. and local government response, these communities came together to take action themselves. Community members created at least 20 Centros de Apoyo Mutuo (CAMs—Mutual Aid Centers) across the country, as part of an emerging movement around community-based disaster response and ongoing self-management that is gaining strength across the island. CAMs are organized by local community members to identify their own needs, organize rebuilding, and sustain long-term collective resilience and resistance. In many cases, they are linked with community organizations that have been rooted in local communities for many years, if not decades. One example is the Proyecto de Apoyo Mutuo in the community of Mariana. The community was able to obtain a BoxPower solar microgrid container to provide reliable power to its community center for urgent needs, and to provide opportunities for sustainable livelihoods and community building (e.g., a new locally run solar laundromat, hostel, and coffee shop). Other CAMs are beginning to incorporate community-controlled solar energy into their work as well. In each of these situations, CAMs connect energy sovereignty with other community efforts, including community kitchens (for collective preparation and sharing of meals), vegetable gardens, filters to ensure that local rivers provide access to clean water, popular education, and community organizing to take on the many other “hurricanes” that have impacted the island long before Hurricane Maria—namely, the debt, privatization of social services, and U.S. colonialism. In all of their work, CAMs demonstrate how local wisdom, solidarity, and self-determination can power a just recovery.



Photo © Energynext

Failed top-down strategy

Large-scale solar in India

In 2010, India released its national solar policy, the Jawaharlal Nehru National Solar Mission (JNNSM), which set ambitious targets for solar energy production.⁵⁸ While this project was meant to provide greater access to energy for Indian peoples, it resulted in many negative impacts. First, the large-scale solar projects required large pieces of land, which led to the enclosure of commons and land acquisitions under the guise of sustainable energy and development.⁵⁹ This resulted in less land available for agriculture and, more generally, less land access and governance by local communities. Land claims between local populations and the government are often highly contentious and can take over a decade to resolve.⁶⁰ Many in India experienced unfair compensation for their land. The injustices resulting from these projects can also have the long-term effect of instilling a sense of distrust in political institutions in affected populations.⁶¹ If these sorts of solutions continue to be forced on communities, they are likely to develop a general resistance to future solutions.

Community governance of renewables:

Threats to success

Capital is a primary barrier for community-scale renewable energy projects, as sizable up-front investments are required.⁶² Such costs include the purchasing of technology and infrastructure, as well as costs associated with legal guidance and regulatory compliance.⁶³ Moreover, government subsidies for fossil fuel energy make it harder for community-controlled renewables to stay competitive. The legal and regulatory requirements often associated with small-scale renewable generation also pose barriers, as they require access to specialized knowledge. Utilities, under threat of competition, have also acted as barriers to community renewables, leveraging their financial and political capital to make implementation of community renewables more difficult.⁶⁴

Direct resistance to extractive industries



While climate-change actors have spent decades working on reducing the demand for fossil fuels, leading economic and political analysis suggests that supply-side strategies are effective and underutilized.⁶⁵ Recent campaigns to stop the Keystone XL Pipeline, the Dakota Access Pipeline through Standing Rock, oil and gas development in the Amazon, and overall efforts to stop tar-

sands extraction have highlighted the extent to which these strategies have the power to be effective both in achieving local goals and in inspiring similar actions in other communities. Local direct action led by communities is often at the center of these campaigns, alongside legal challenges and coordinated pressure on companies and investors. Direct resistance to extractive industries, including fossil fuels and other nonrenewable resources, has the potential to reduce greenhouse gas emissions directly from the prevented extraction as well as from the cascading effects of unburned fossil fuels. Extractive industries are often tied to “resource curse” scenarios, in which communities have a wealth of natural resources but realize reduced economic, democratic, and development outcomes. In this way, resisting extractive industries can not only benefit climate, but also give communities the power to manage their natural, cultural, and economic resources independently.



Photo © Mining, CC BY-SA 3.0, JaySeif

Direct resistance to extractive industries as a grassroots climate solution



ADDRESS
ROOT CAUSES

- Stopping industries avoids direct emissions from mining, drilling, transporting, and refining, and circumvents downstream emissions from burned fossil fuels.
- Resistance increases the costs of fossil fuel extraction leads to the greater competitiveness of renewables in energy markets.



ARE PLACE-BASED

- Communities advocating against the extraction of natural resources are tied to the particular geographies of the resources, as opposed to extractive industries, which serve global commodity markets.



ARE LED BY
COMMUNITIES

- Communities directly impacted by extractive industries are best able to assess the needs of the community and advocate on its behalf.



ELEVATE FRONTLINE
LEADERSHIP

- Direct resistance strategies are often led at the local level, which gives impacted populations greater opportunities to engage in and lead the solutions to the issues that impact them.



BUILD
LOCAL RESILIENCE

- Most often, extractive industries consist of non-local actors, so resistance to them increases the local community's control over and use of its natural resources.
- Diverse economies not reliant on extractive industries are more resilient to external market and political shocks.
- Local actors feel supported and able to continue to exercise agency over problems facing their communities.



ADVANCE
HUMAN RIGHTS

- Resistance supports local governance, Indigenous rights to territory and self-determination, consultative rights, and public health.

Direct resistance to resource extraction:

Greenhouse gas (GHG) reduction potential

Emissions from extractive industries

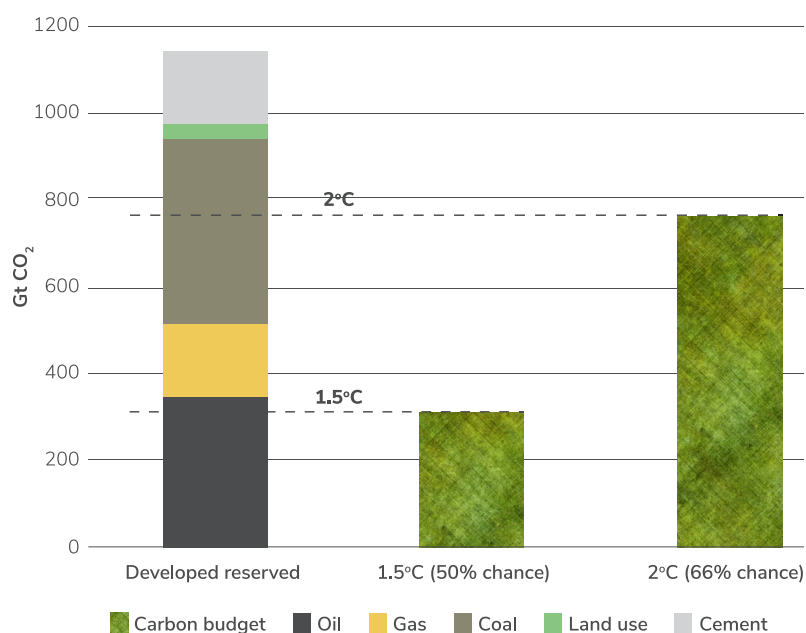
Beyond their cultural and economic disruption, extractive industries are a significant source of GHG emissions from the direct extraction of natural resources, the electricity generated to support the mining, the transportation of raw materials, and the leaking of fossil fuels while being moved through a pipeline. These emissions collectively are projected to equal

18.7 gigatons of CO₂e by 2050.⁶⁶

Keeping fossil fuels in the ground

The largest possible GHG reduction from resisting extractive industries would come from the prevention of burning extracted fossil fuels. A 2° future means the devastation of many low-lying island nations; irreparable damage to water and food systems in many places, including Sub-Saharan Africa; and unconscionable loss of human life.⁶⁷ Staying under 1.5° requires a moratorium on new fossil fuel development, as developed reserves still significantly exceed the carbon budgets for a one-in-two chance of limiting warming to 1.5° (see Figure 3).⁶⁸ This means preventing the extraction and burning of oil reserves, gas reserves, and current coal reserves.⁶⁹ By our estimate, global emissions from fossil fuels are anticipated to emit **1,283 gigatons of CO₂e by 2050**, so ending fossil fuel extraction could reduce the consumption to only those already pulled from the ground.⁷⁰

Figure 3: **Developed fossil fuel reserves, compared to carbon budgets in the 5TH IPCC assessment**



Other studies have shown that current efforts to eliminate emissions from fossil fuels have focused largely on reducing demand for fossil fuels by supporting alternatives, such as renewables. Those efforts are critical as well, and must coexist along with strategies to create a just transition away from fossil fuels. Strategies focused on reducing the supply of fossil fuel resources are not only more cost-effective and politically effective than demand-side strategies alone, but are also necessary if we are to transition away from fossil fuels fast enough to keep a 1.5° future.⁷¹ We have seen from the Keystone XL Pipeline example, which alone would have moved 2.8 gigatons worth of tar-sands oil to market, that stopping extraction creates a financial liability beyond the specific project that is being protested; it extends to fossil fuel infrastructure more broadly. Research has shown that struggles to stop the Keystone XL Pipeline coincided with a peak in tar-sands oil investment, which has never since recovered.⁷² In response to the organizing efforts to stop the Dakota Access Pipeline, several cities, including Seattle, Santa Monica, and Davis, California, divested more than \$1.1 billion from Wells Fargo.⁷³

Direct resistance to resource extraction:

Knowledge gaps

The impacts of ending extractive industries on the global economy are difficult to measure or predict. Furthermore, supply-side strategies can fail when they are not comprehensive, as they may lead to leakage—i.e., production that does not happen in one region could happen in another region. What we are learning now, but have yet to see in full scale, is the extent to which grassroots resistance of extractive industries, such as the Standing Rock or Keystone XL Pipeline opposition, can affect areas beyond their individual geographies. For example, resistance from the Keystone XL Pipeline might deter similar developments in different geographies simply out of fear that they might face the same kind of resistance.

Direct resistance to resource extraction:

Co-benefits outside of climate

Resisting extractive industries helps to mitigate climate change and preserve the environment; it also has a variety of benefits for public health. Extractive industries have a long history of causing air and water pollution—particularly in the communities local to the sites of extraction, which are often marginalized communities without the sociopolitical capital to exclude these industries from their backyards.⁷⁴ In fact, Native women-led organizations, including Honor the Earth and Mazaska Talks, play leadership roles in divestment campaigns, demonstrating how grassroots solutions often have a positive symbiotic relationship. Preventing new fossil fuel extraction also works to lower income inequality, which is often exacerbated by the presence of extractive industries in local communities.⁷⁵



Health of Mother Earth
Foundation, Nigeria
Direct Resistance

Direct resistance to resource extraction:

Cost of inaction

If we do not end the extraction of fossil fuels, we cannot stop catastrophic climate change. There is no pathway to a 1.5° future without ending fossil fuel production, and studies have shown that supply-side strategies are a necessary component of a strategy that ends fossil fuel production.⁷⁶ The associated costs of inaction on communities are incalculable, but include loss of culture, language, land, and lives.

Direct resistance to resource extraction:

Prior efforts



Successful implementation

Resisting Oil and Gas Development by the Kichwa People of Sarayaku

In 1996, the Ecuadorian government approved oil drilling in land titled to the Kichwa people of Sarayaku without their permission. In response, Sarayaku began organizing a network of national and international allies, including other Indigenous groups that have had governments coerce them into natural resource extraction through intimidation, political pressure, or fatigue. As a result of successful organizing at a national and international level, the Ecuadorian government acknowledged responsibility for illegally licensing an oil company to do business on Sarayaku territory without their consent. Subsequently, the Inter-American Court of Human Rights ruled that the government must consult with Indigenous communities prior to such enterprises, and pay for physical and moral damages to the communities. By thus far preventing oil development in their territory, the people of Sarayaku have kept an estimated 100 million barrels of oil in the ground.⁷⁷ In 2018, they launched the Kawsak Sacha, or Living Forest, proposal to create a new international category of permanent protection of Indigenous territories free of natural resource extraction. The people of Sarayaku have since come to symbolize Indigenous resistance to oil, logging, and mining throughout the Amazon, including other attempts at oil development on Sarayaku land by ConocoPhillips.⁷⁸ This is an excellent example of the natural intersection between Indigenous territory rights and resistance to extractive industries, as well as the success of movements in mitigating emissions.



Photo © Mining, South Africa, CC BY-SA 3.0

Failed top-down strategy

Corporate Social Responsibility in Africa

Corporate Social Responsibility (CSR) is viewed by some as a solution to minimizing the negative impacts of extractive industries in Africa. CSR, however, has a number of shortcomings. CSR is sometimes viewed as a public relations exercise to improve the image of a company engaging in fossil fuel extraction, alleviating surface-level issues that better the company's image while not providing any long-term or sustainable solutions.⁷⁹

CSR has historically been shown to, in effect, silence local community concerns, despite stated efforts to respond to them. On a more fundamental level, liberalization, state retrenchment, and the continuous transfer of public responsibilities to private actors have complicated accountability mechanisms.⁸⁰ All of these factors have generally prevented CSR efforts from truly solving or alleviating problems local communities face as a result of extractive industries. A specific example is the CSR failings of Lonmin, a platinum mining company, in South Africa.⁸¹ The role of the company in the local community and its treatment of employees led its workers to depend on the company for basic necessities, such as housing. However, despite all of its public-facing claims, the company failed to meet its housing plans for workers, which resulted in a large portion of its employees living in dehumanizing circumstances. This led to a labor dispute between the workers and Lonmin, which resulted in what is now known as the Marikana massacre, in which 34 workers were killed when police opened fire on a demonstration.⁸²

Direct resistance to resource extraction:

Threats to success

A growing threat to the success of grassroots resistance to extractive industries is the violence against activists, particularly women activists. Such acts include criminalization, violence, sexual abuse, intimidation, and reprisals.⁸³ From January 1, 2018 to September 17, 2018, at least 66 environmental defenders were killed.⁸⁴ This violence not only harms individual activists, their families, and communities, but it also discourages activists from continuing or starting their work. While support for these activists, financially or otherwise, can help advance their work, it can also lead to the activists having higher public profiles, which can lead to greater publicity and danger. Activists also face opposition from private interests and sometimes from their own governments, which reap a disproportionate concentration of benefits from extractive industries.⁸⁵

More and more, activists must counter the development or maintenance of the fossil fuel industry alongside other energy developments branded as “clean,” such as mega-dams or incineration facilities, which actually cause a great deal of harm to the environment and to communities. Funders can play a valuable role in countering these trends by divesting from extractive industries (both in their portfolios and within their endowments), supporting efforts to defend human rights of environmental defenders, and ensuring their grantmaking process is not exposing environmental defenders to undue visibility and risk.



Urgent Action Fund
Ima Chandragini, India
Direct Resistance

Indigenous Peoples as frontline defenders



Indigenous Peoples have long been frontline environmental defenders and holders of knowledge and traditions crucial to addressing climate change. The loss of ancestral land as a result of colonization and the struggle for legal recognition is an experience shared by many Indigenous communities. Indigenous Peoples still manage 18 percent of land, meaning that even if

they do not have explicit land rights, they plant, hunt, harvest, and conserve the land regardless. In one-third of tropical and subtropical forests managed by Indigenous Peoples, they lack formalized land-tenure rights, although they manage the land.⁸⁶ As land has been systematically taken from Indigenous Peoples by colonial governments, agribusinesses, and other corporations, the return of these territories to Indigenous Peoples to protect their lives and livelihoods is paramount.

Deforestation and forest degradation have significant impacts on Indigenous and forest-dependent peoples. Even though the majority of greenhouse gas emissions come from fossil fuel combustion, deforestation also contributes to the accumulation of carbon dioxide in the atmosphere. As the impacts of climate change increase, maintaining and improving the Earth's remaining forests is crucial to the survival of the planet.



Learning Exchange in Chiapas, Mexico. Hosted by DESMI (Organization for Social and Economic Development of Indigenous Mexicans), Mexico
Indigenous Rights

Indigenous Defenders as a grassroots climate solution



ADDRESS
ROOT CAUSES

- Prevent the continued theft of Indigenous land, and allows Indigenous worldviews that center on the care of Earth and climate to persist.
- Enable continued carbon sequestration from Indigenous land-management practices. Maintain lower rates of deforestation than commercially, privately, or government-owned land.



ARE PLACE-BASED

- Acknowledge that holding land is inherently tied to place, and Indigenous Peoples' sense of traditions and knowledge are tied to place.



ARE LED BY
COMMUNITIES

- Ensure that decision-making power related to land management is held within the community, as opposed to being held by external actors.



ELEVATE FRONTLINE
LEADERSHIP

- Increase sovereignty and economic empowerment from land holding.



BUILD
LOCAL RESILIENCE

- Ensure capacity for Indigenous Peoples to adapt to changing economic, political, and environmental conditions.



ADVANCE
HUMAN RIGHTS

- Advance social justice and public health.

Indigenous Defenders:

Greenhouse gas (GHG) reduction potential

Studies suggest that as much as a quarter of above-ground stored carbon (200 gigatons of CO₂e) is held in the 1.3 billion acres of land managed by Indigenous Peoples, or roughly twice the amount of carbon held by North American forests.^{87, 89} Multiple studies have shown that lands taken from Indigenous Peoples are more likely to be deforested for agriculture and mining than those that remain under Indigenous holding—making Indigenous rights critical for carbon mitigation.⁸⁸ Many studies have shown that land managed by Indigenous Peoples with strong land tenure has significantly lower rates of deforestation than land under other governance systems, including protected areas. Strengthening rights on land and forests already managed by Indigenous Peoples can ensure the protection of 200 gigatons of CO₂e stored in standing forests. Expanding Indigenous land rights onto lands where Indigenous Peoples already informally manage the land can prevent additional deforestation, resulting in a reduction of another 6 gigatons of CO₂e by 2050. Deforestation currently accounts for some 11 percent of global greenhouse gas emissions.⁸⁷ Securing land-tenure rights on Indigenous lands, particularly forested or historically forested lands, has enormous GHG reduction potential through two main avenues: securing the rights of Indigenous Peoples on lands they already manage, and expanding Indigenous Peoples' land management so more places will have decreased rates of deforestation.

Multiple studies have shown that Indigenous forest lands have lower rates of deforestation than other land types; in the Brazilian Amazon, deforestation on Indigenous lands occurred at less than 1 percent per year, compared with a rate of 7 percent per year on non-Indigenous lands.⁹⁰ Securing formal, legal land rights on lands already managed by Indigenous Peoples—formally or informally—could avoid deforestation on the 1.3 billion acres that Indigenous Peoples already manage; complete deforestation on these lands would result in 200 gigatons of CO₂e being released.⁹¹ Newer estimates have this number potentially much higher—as much as 300 gigatons of carbon, or roughly 33 times the global energy emissions for 2017.⁹²

In addition to securing land rights on lands already managed by Indigenous Peoples, returning historical and ancestral land rights to Indigenous Peoples could prevent the deforestation of an additional 900 million acres of forestland, equivalent to 6.2 gigatons of CO₂e by 2050 in emissions reductions.



Indigenous Defenders:

Knowledge gaps

There are myriad assumptions baked into the studies and calculations we draw from that may overestimate or underestimate the effects of Indigenous forest management. There is no exact science to determine where the impact of Indigenous rights on deforestation and emissions ends and where that of other factors start. For example, there exists a larger trend wherein global rates of annual deforestation have decreased from 0.18 percent during the period of 1990-2000, to 0.08 percent in the period of 2010-2015.⁹³ Furthermore, securing any land rights (Indigenous or otherwise) has been shown to have improved outcomes related to deforestation.⁹⁴ In addition, Indigenous lands include those beyond forests, such as grasslands and wetlands, whose carbon benefits have received less academic focus.

The co-benefits of Indigenous land management include strengthening the social, cultural, and political ties and capital of local communities, particularly by fostering Indigenous populations' cultural and social ties to the land. This strengthening prevents the breaking up of communities, which can lead to loss of language, tradition, and cultural succession. Research has shown that the (re)building and strengthening of these ties can also contribute to greater mental health of Indigenous populations.⁹⁵



Mixe People's Services
(SER Mixe), Mexico
Indigenous Rights

Indigenous Defenders:

Cost of inaction

The cost of denying Indigenous Peoples territories that have cultural, spiritual, and political significance is impossible to value. Beyond human rights implications, the largest at-risk carbon stocks in the world are at stake, including the Amazonian rain forest, forests of Indonesia and Southeast Asia, and forests in central Africa. There are 370 million Indigenous Peoples globally. While Indigenous Peoples make up 5 percent of the world's population, they represent 15 percent of the world's extreme poor.⁹⁶ Insecure territorial rights, discrimination, heightened vulnerability to risk and climate change, and health and socioeconomic disparities all affect Indigenous populations.⁹⁷

Indigenous Defenders: Prior efforts



Photo © Aboriginal art, Pixabay.com

Successful implementation

West Arnhem Land Fire Abatement Project in Australia

In the West Arnhem Land Fire Abatement project in Australia, Australian Aboriginal landowners applied their traditional practice of burning regimes to prevent late-season wildfires, leading to greenhouse gas emissions reductions. These burning regimes, which seek to reduce biomass that serve as fuel for fire, lower the risk of catastrophic fires, which cause significant carbon emissions.⁹⁸ The Aboriginal population was able to exercise their legal right to practice traditional land-management practices, which have proven effective for centuries and, in this case, helped mitigate climate change. Additionally, this practice strengthened the Aboriginal population's cultural traditions and community and provided health benefits to the local populations. Aboriginal peoples believe that their association with and caring for their ancestral lands improves their health by creating opportunities ranging from physical activity and improved nutrition, to increased agency and self-esteem.⁹⁹ Across the world, such culturally tied activities that boost health have helped in targeting substance abuse and chronic diseases, and uphold sacred practices rooted in the relationship between Indigenous Peoples with ancestral land and seas.¹⁰⁰



Photo © Deforestation, Pixabay.com

Failed top-down strategy

REDD+

An example of a failed land-management practice is the Reducing Emissions from Deforestation and Forest Degradation program (REDD+). Initially, REDD+ was implemented by the United Nations and the World Bank to create an international forest governance system to reduce greenhouse gas emissions at various governmental levels. In practice, however, REDD+ programs have not reduced emissions, protected forests, or upheld Indigenous rights. They have often resulted in the disruption of local communities' livelihoods and strategies, institutions, and sociocultural systems through inequitable benefit distribution; food insecurity; illegal land acquisition; the growth of monoculture farming; and invasive, powerful stakeholders.¹⁰¹ In addition, the program does not reduce emissions, but rather creates an offset that allows polluters to produce greenhouse gas emissions, with particularly acute impacts on communities where those emissions are located. Moreover, REDD+ is often used to strip Indigenous Peoples of their territorial rights and fails to use free, prior, and informed consent. The definition of forest under the UNFAO includes monoculture tree plantations. Therefore, REDD+ has not incentivized protection of forests and biodiversity, as forests can qualify as an offset while being clear-cut and replanted as monocultures. For example, carbon-trading companies have applied for rights to one-third of Mozambique to sell REDD credits. In Envirotrade's N'hambita Community Carbon Project, farmers receive an annual payment of only \$63 for seven years to plant trees on their land, while remaining tied to the contract for 99 years. When media conducted interviews, none of the farmers understood the concept of carbon trading.¹⁰²

Indigenous Defenders:

Threats to success

Indigenous and forest-dependent community land rights are often threatened by a complex web of decision-making. This includes various government entities, banks, conservation NGOs, and corporations that further a historical process of land grabbing. Private entities with significant monetary capital and an interest in the ownership and management of Indigenous land often hold significant sociopolitical capital that strengthens their position and interests. In many nations, such as the United States, legislation has been designed to serve as a barrier for Indigenous Peoples to own and exercise territorial rights. Schemes that create a financial value for the carbon stored in forests, offering economic incentives for Southern countries to reduce emissions from forested lands, often undermine Indigenous and forest-dependent communities' livelihoods. For example, offset and REDD+ programs have been linked to increased conflicts in Indigenous Peoples' territories. These schemes have been proposed and implemented by the UNCCC, multilateral financial institutions, industry lobbying groups, large conservation organizations, and subnational climate programs.



Mixe People's Services
(SER Mixe), Mexico
Indigenous Rights

Palestine, Gaza
Agroecology

Conclusion

Conclusion

We are losing the battle against climate change. Philanthropies have dedicated billions of dollars to address climate change through policy, but emissions continue to rise. The structural oppositions of inertia and an organized fossil fuel lobby are enormous; an economic and societal drive toward consumption and short-term economic growth has remained more significant than a drive to address climate. There isn't enough foundation funding in the world to counter the power of the fossil fuel industry and shift the economic drivers of climate change. Instead, philanthropies should leverage the enormous investment already being made by communities: farmers sequestering carbon and cooling the planet through agroecology, women leading frontline communities building resistance and resilience, Indigenous Peoples protecting water and territory, and grassroots communities risking everything to keep fossil fuels in the ground and to implement their visions for a positive future. The potential public investment in climate stability and collective well-being is enormous, and philanthropy has an opportunity to help it take off.

Community-based solutions are essential to achieving a low-carbon, equitable world. Issues such as gender equity and Indigenous rights are not just co-benefits of grassroots climate strategies, but rather are themselves cross-cutting solutions. These solutions, taken in aggregate, are as significant as strategies currently pursued by climate philanthropies. We cannot prevent a 1.5° future without addressing the underlying drivers of climate change, such as economic exploitation, racism, patriarchy, and suppressed human rights. Strategies that include an analysis of these systems alongside direct climate mitigation are untapped opportunities for climate philanthropies to achieve massive greenhouse gas reductions.

Grassroots organizations are often more effective and efficient than large, international NGOs. Because they are directly connected to communities they serve, grassroots organizations are able to get more out of a grant dollar than their larger, international counterparts. Furthermore, their commitment to a place and recognizing local leadership make them more effective conduits for the kind of change that they seek to address. Grassroots organizations are more efficient and effective at driving change that addresses root causes of the climate crisis from the ground up.

Beyond mitigation of emissions, grassroots strategies empower the people most affected by climate change. Grassroots climate solutions inherently tackle the underlying drivers of climate change, which are addressed by advancing human rights, universal education, improved public health, and racial and economic justice. These strategies improve the capacity of communities to react and adapt to a changing climate, building resilience in those communities on the front lines of climate change impacts.

Climate philanthropies have been hesitant to embrace community-level solutions. Solutions at this scale have been viewed by the world's largest climate philanthropies as too hard and diffuse to tackle, and have therefore been passed over for solutions from industry and government that promise emissions reductions at scale. Furthermore, the world's largest philanthropies are increasingly being criticized for being built on the fruits of extractive, global industries.^{103, 104} To truly address climate change, philanthropies must embrace the "unprecedented transition" called for by the 2018 IPCC report; the structures that built the problem are not the same as those from which solutions will arise.

The question is not "how," but "how soon." Effective grassroots organizations and movements around the world are already busy promoting agroecology; defending Indigenous land, water, and territories; recognizing women's leadership and advancing gender equity; and ensuring local governance over energy systems. These strategies have the capacity to yield massive emissions-reductions potential, but they take time. Climate philanthropies must quickly embrace grassroots solutions as an integral part of their portfolios if they are to be successful. These opportunities have been missed in the past, but they are integral to everything that philanthropy hopes to achieve: economic security, healthy communities, empowered leaders, and a climate in which future generations can thrive. The sooner that these solutions are embraced, the more likely they are to reach their full potential in time to avoid catastrophic change.



Gender and Economy
Group, Mexico
Women's Leadership

CLIMA Fund

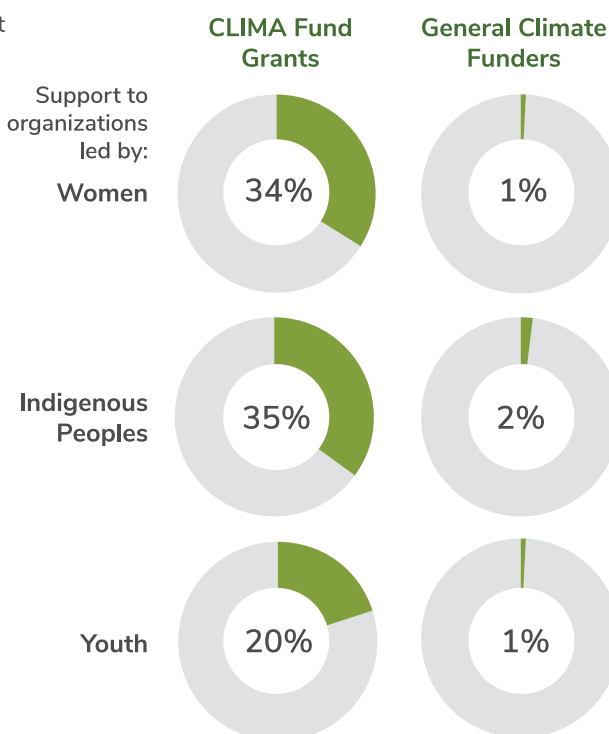
Grassroots climate solutions are a necessary component of our efforts to mitigate climate change. Despite these solutions' record of success and significant potential for impact, philanthropy has been slow to advance these solutions, often citing barriers such as unfamiliarity, risk, lack of existing grassroots networks, and the operational difficulty of funding dispersed solutions. Fortunately, however, the CLIMA Fund provides a means through which philanthropy can engage in grassroots climate solutions with ease, efficiency, and success.

The CLIMA Fund, a collaboration between the Global Greengrants Fund, Grassroots International, Thousand Currents, and the Urgent Action Fund for Women's Human Rights, is unique in its form and function. Leveraging the collaborative's 100+ years of collective experience supporting movement-building and uplifting community-driven solutions, the CLIMA Fund mobilizes philanthropic capital to support grassroots climate solutions, managing the administration, scoping, vetting, planning, and evaluation of grants. Larger funders, which do not have the infrastructure and relationships to reach grassroots organizations, can invest in the CLIMA Fund as an intermediary to both learn from and partner with community-level organizations advancing climate action.

Providing support to effective grassroots climate solutions by:

- 1. Supporting groups tackling climate change at its source.** Grassroots-driven action leads to durable and place-based solutions, from stopping fossil fuel extraction to reducing greenhouse gas emissions.
- 2. Providing more holistic support to grassroots climate protagonists.** The CLIMA Fund's four public foundations acknowledge the value of supporting movement ecosystems, using complementary models to support climate justice movement building—from rapid response grants for environmental defenders whose lives are being threatened to long-term partnership and support to progressive social movements.
- 3. Integrating a gender-justice and racial-justice lens.** The CLIMA Fund prioritizes empowerment of women, youth, peasants, Afro-descendant communities, and Indigenous Peoples, whose intimacy with the challenges climate presents result in their having the most innovative and effective solutions.¹⁰⁵ Figure 4 highlights the differences in funding between the CLIMA Fund member organizations and general climate funders.¹⁰⁶
- 4. Nourishing movement connectivity and learning exchange.** By interweaving their program teams, partner organizations are more effectively being linked to each other regionally and across movements.
- 5. Taking initiative and experimenting in resourcing movements.** By creating a project that is bigger than, and distinct from, the member organizations, the CLIMA Fund has a platform to creatively experiment with how it is providing movement support.

Figure 4: CLIMA Fund member organizations grantmaking vs. general climate funders



The CLIMA Fund grows the field of climate philanthropy:

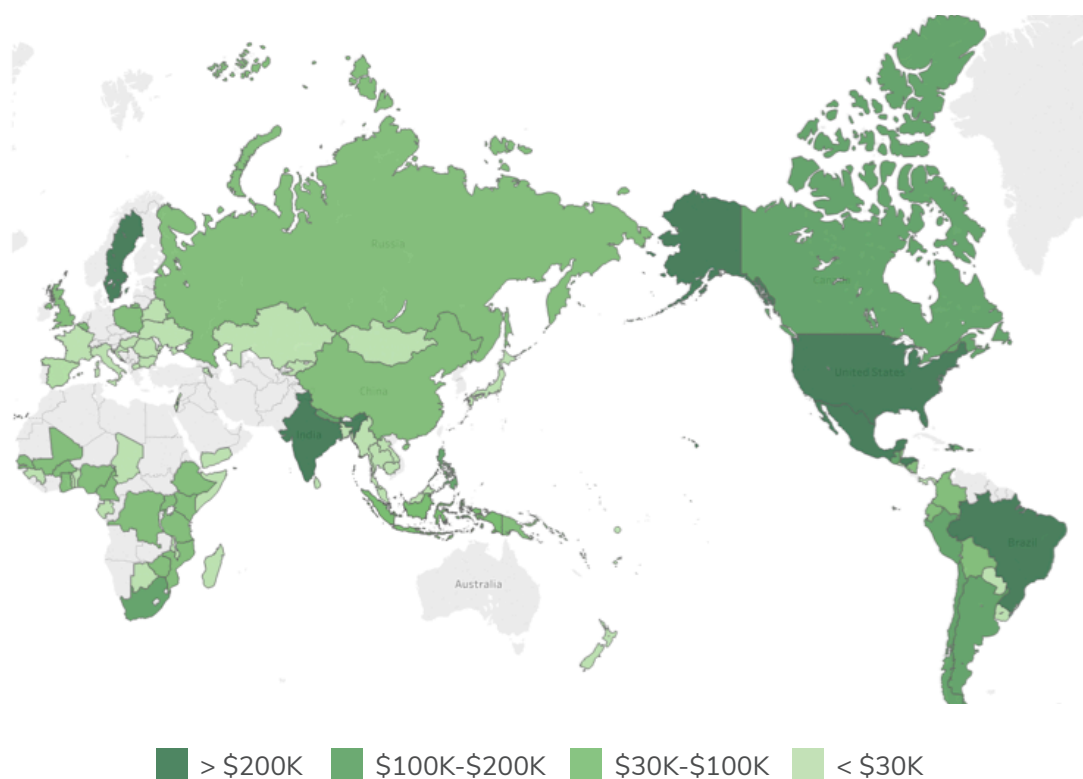
- 1. Builds the field of grassroots climate philanthropy.** The CLIMA Fund is part of the growing ecosystem of funders bolstering the visibility of grassroots climate philanthropy globally. By expanding and cultivating new collaborations with journalists, media influencers, and donors, the CLIMA Fund will channel more resources towards grassroots climate solutions writ large.
- 2. Leverages new financial and nonfinancial resources.** The CLIMA Fund is attracting grants from funders that would not otherwise support grassroots work, thus growing the pie for climate solutions. The CLIMA Fund is also bringing grassroots voices to multilateral decision-making processes—influencing the process of climate policy from the top, with the wisdom of the grassroots.
- 3. Provides learning opportunities for new or larger funders.** Newer funders with little experience in climate justice philanthropy or larger funders that do not have the infrastructure to reach or listen to grassroots change makers need intermediaries to learn from grassroots leadership; the CLIMA Fund has the capacity and connectivity to resolve these barriers and create learning spaces for funders.



The CLIMA Fund facilitates more effective and efficient grant-making:

1. **Increases efficiency and scale of grantmaking.** First, the collaborative has existing grantmaking infrastructure in over 100 countries in order to reach the grassroots, with diffuse grantmaking in each of the countries. Larger funders that do not have the time, resources, nor experience to create such infrastructure can thus more efficiently move their money towards community-driven change through the CLIMA Fund. Second, the CLIMA Fund leverages the programs, communications, and evaluation teams of the four member organizations to support grassroots work at a scale larger than any one of the organizations could achieve.
2. **Enhances mapping and translation of grassroots impact.** Because of the CLIMA Fund's reach and expertise, it is pooling its knowledge to translate the work of the grassroots in new ways. The CLIMA Fund's evaluation teams are working together to create new metrics and methods for tracking the impact of climate movement building on climate mitigation and resilience.
3. **Strengthens the grantmaking of the member organizations.** As the four primary public foundations reaching grassroots climate movements globally, the CLIMA Fund provides a mechanism for each foundation to learn from and challenge each other.

Figure 5: **CLIMA Organizations' Grantmaking by Country, Thousand USD (2016)**



For more information about the CLIMA Fund, visit <https://thousandcurrents.org/clima-grassroots-climate-solutions-fund/> or contact CLIMA Fund's coordinator, **Lindley Mease**, at lindley@climasolutions.org.

References

- ¹ NASA Global Climate Change, "Vital Signs of the Climate." <https://climate.nasa.gov/vital-signs/carbon-dioxide/>
- ² Foundation Center and the Council on Foundations, "The State of Global Giving by U.S. Foundations," 2018. <https://www.issuelab.org/resources/31306/31306.pdf>
- ³ Cleveland, Ann, Charles McElwee, and Surabi Menon, "2050: Philanthropic Priorities for Climate Action," ClimateWorks Foundation, 2017. <https://www.climateworks.org/blog/2050-philanthropic-priorities-climate-action/>
- ⁴ Ayers, Jessica and Forsyth, Tim, "Community-Based Adaptation to Climate Change," *Environment: Science and Policy for Sustainable Development* 51, no. 4 (September 2009): 22–31. <https://doi.org/10.3200/ENV.51.4.22-31>
- ⁵ Foundation Center and the Council on Foundations, "The State of Global Giving by U.S. Foundations," 2018. <https://www.issuelab.org/resources/31306/31306.pdf>
- ⁶ Analysis completed by CEA using data from the Environmental Grantmakers Association regarding 2016 giving.
- ⁷ Taylor, Dorceta E. "The State of Diversity in Environmental Organizations: Mainstream NGOs Foundations Government Agencies," 2014. <http://vaip.org/wp-content/uploads/2014/10/ExecutiveSummary-Diverse-Green.pdf>
- ⁸ Hansen, Sarah, "Cultivating the Grassroots," National Committee for Responsive Philanthropy, 2012. https://www.ncrp.org/wp-content/uploads/2016/11/Cultivating_the_grassroots_final_lowres.pdf
- ⁹ Tugend, Alina, "Women's Crucial Role in Combating Climate Change," *The New York Times*, December 22, 2017. <https://www.nytimes.com/2017/04/01/us/womens-crucial-role-in-combating-climate-change.html>
- ¹⁰ Humphreys, Macartan, Jeffrey D. Sachs, and Joseph E. Stiglitz, "Escaping the Resource Curse," Columbia University Press, 2007.
- ¹¹ Bayrak, M.M. and Marafa, L.M., "Ten Years of REDD+: A Critical Review of the Impact of REDD+ on Forest-Dependent Communities," *Sustainability* 2016, 8(7), 620. <https://www.mdpi.com/2071-1050/8/7/620>
- ¹² Masters, Barbara and Osborn, Torie, "Social Movements and Philanthropy: How Foundations Can Support Movement Building," *The Foundation Review* 2, no. 2 (June 1, 2010): 12–27. <https://doi.org/10.4087/FOUNDATIONREVIEW-D-10-00015>
- ¹³ Ibid.
- ¹⁴ Ibid.
- ¹⁵ Erica Chenoweth, 2013 TED Talk. <https://www.youtube.com/watch?v=YJSehRIU34w>
- ¹⁶ The Goldman Environmental Prize, "Threats to Environmental Activists on the Rise," 2014. <https://www.goldmanprize.org/blog/threats-environmental-activists-rise/>
- ¹⁷ Arora-Jonsson, Seema, "Virtue and vulnerability: Discourses on women, gender and climate change," *Global Environmental Change*, 21 (744-751), 2010. http://www.cifor.org/fileadmin/subsites/crp/discussion/pdf/virtue_vulnerability.pdf
- ¹⁸ UN Women Watch, "The majority of food production is stewarded by women in developing countries," 2009. http://www.un.org/womenwatch/feature/climate_change/factsheet.html
- ¹⁹ Ibid.
- ²⁰ Demetriades, Justina and Esplen, Emily, "The Gender Dimensions of Poverty and Climate Change Adaptation," *IDS Bulletin* 39(4): 25-31, 2009. <https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1759-5436.2008.tb00473.x>
- ²¹ Ibid.
- ²² Global Greengrants Fund, Prospera International Network of Women's Funds, and Wallace Global Fund, "Our Voices, Our Environment," 2017. <https://www.greengrants.org/our-voices-our-environment/>
- ²³ WE CAN, 2018. <https://wecaninternational.org>
- ²⁴ Calma, Justine. "Hurricane Maria hit women in Puerto Rico the hardest. And they're the ones building it back" *Grist*, 2018. <https://grist.org/article/hurricane-maria-hit-women-in-puerto-rico-the-hardest-and-theyre-the-ones-building-it-back/>
- ²⁵ Global Greengrants Fund, Prospera International Network of Women's Funds, and Wallace Global Fund, "Our Voices, Our Environment," 2017. <https://www.greengrants.org/our-voices-our-environment/>
- ²⁶ "Barack Obama on food and climate change: 'We can still act and it won't be too late,'" *The Guardian*, May 26, 2017. <https://www.theguardian.com/global-development/2017/may/26/barack-obama-food-climate-change>
- ²⁷ Niles, M.T., Ahuja, R., Esquivel, M.J., Mango, N., Duncan, M., Heller, M., Tirado, C, "Climate change and food systems: Assessing impacts and opportunities." Meridian Institute, 2017. <http://bit.ly/2oFucpe>
- ²⁸ GRAIN, "Food and climate change: the forgotten link, 2011. <https://www.grain.org/e/4357>
- ²⁹ UNCTAD, "Wake up before it is too late: Make agriculture truly sustainable now for food security in a changing climate," *Trade and Environmental Review*, 2013.
- ³⁰ FAO Agroecology Knowledge Hub. <http://www.fao.org/agroecology/en/>
- ³¹ FAO, "Agroecology can help change the world's food production for the better," 2018. <http://www.fao.org/news/story/en/item/1113475/icode/>

- ³² Olivier de Schutter, "Report: Agroecology and the right to food," 2011. <http://www.srfood.org/en/report-agroecology-and-the-right-to-food>
- ³³ GRAIN, "Food and climate change: the forgotten link," 2011. <https://www.grain.org/e/4357>
- ³⁴ Altieri, Miguel A., Clara I. Nicholls, Alejandro Henao, and Marcos A. Lana, "Agroecology and the Design of Climate Change-Resilient Farming Systems," *Agronomy for Sustainable Development* 35, no. 3 (July 2015): 869–90. <https://doi.org/10.1007/s13593-015-0285-2>
- ³⁵ GRAIN, "Food and climate change: the forgotten link," 2011. <https://www.grain.org/article/entries/4357-food-and-climate-change-the-forgotten-link>
- ³⁶ Ibid; these numbers are larger than some other estimates as they include the post-production emissions of the food system extrapolated from data from the EU and other OECD countries.
- ³⁷ United Nations, Trade and Development, "Wake up before it is too late: Make agriculture truly sustainable now for food security in a changing climate," 2013. <https://unctad.org/en/pages/PublicationWebflyer.aspx?publicationid=666>
- ³⁸ Dickie, A., Streck, C., Roe, S., Zurek, M., Haupt, F., Dolginow, A., "Strategies for Mitigating Climate Change in Agriculture: Recommendations for Philanthropy," Climate Focus and California Environmental Associates, prepared with the support of the Climate and Land Use Alliance, 2014. www.agriculturalmitigation.org
- ³⁹ Zhang, D., Rausch, S., and Karplus, V. "Quantifying regional economic impacts of CO2 intensity targets in China". *Ener Econ* 40:687–701, 2013.
- ⁴⁰ Velasquez-Manoff, Moises, "Can Dirt Save the Earth?" *New York Times*, 2018. <https://www.nytimes.com/2018/04/18/magazine/dirt-save-earth-carbon-farming-climate-change.html>
- ⁴¹ Dickie, A., Streck, C., Roe, S., Zurek, M., Haupt, F., Dolginow, A., "Strategies for Mitigating Climate Change in Agriculture: Recommendations for Philanthropy," Climate Focus and California Environmental Associates, prepared with the support of the Climate and Land Use Alliance, 2014. www.agriculturalmitigation.org
- ⁴² Montagnini, F., Ibrahim, M., and Murgueitio Restrepo, M., "Silvopastoral systems and climate change mitigation in Latin America," *BOIS ET FORÊTS DES TROPIQUES*, 2013, N° 316. http://bft.cirad.fr/cd/BFT_316_3-16.pdf
- ⁴³ Hawken, Paul, "Drawdown: The Most Comprehensive Plan Ever Proposed to Reverse Global Warming," Penguin Books, 2017.
- ⁴⁴ Agroecology Now! "Agroecology – Vision, Practice, Movement: Voices From Social Movements." <http://www.agroecologynow.com/video/ag/>
- ⁴⁵ Anderson, C.R., Pimbert, M., and Kiss, C., "Building, Defending and Strengthening Agroecology: Global Struggles for Food Sovereignty," *Agroecology Now!*, 2015. <http://www.agroecologynow.com/wp-content/uploads/2015/05/Farming-Matters-Agroecology-EN.pdf>
- ⁴⁶ Rosset, Peter, "The Multiple Functions and Benefits of Small Farm Agriculture," *FoodFirst*, 1999. <https://foodfirst.org/publication/the-multiple-functions-and-benefits-of-small-farm-agriculture-in-the-context-of-global-trade-negotiations/>
- ⁴⁷ Bacon, Christopher M., Christy Getz, Sibella Kraus, Maywa Montenegro, and Kaelin Holland, "The Social Dimensions of Sustainability and Change in Diversified Farming Systems," *Ecology and Society* 17, no. 4 (2012). <https://doi.org/10.5751/ES-05226-170441>
- ⁴⁸ A gwoupman is a traditional Haitian form of organization in which families work together to cultivate land, share livestock, build savings, and support each other socially and politically.
- ⁴⁹ Philpott, Tom, "No, GMOs Didn't Create India's Farmer Suicide Problem, But ...," *Mother Jones* (blog), September 30, 2015. <https://www.motherjones.com/food/2015/09/no-gmos-didnt-create-indias-farmer-suicide-problem/>
- ⁵⁰ Gutierrez, Andrew Paul, Luigi Ponti, Hans R Herren, Johann Baumgärtner, and Peter E Kenmore, "Deconstructing Indian Cotton: Weather, Yields, and Suicides," *Environmental Sciences Europe* 27, no. 1 (December 2015). <https://doi.org/10.1186/s12302-015-0043-8>
- ⁵¹ IEA, "Policy Considerations for Deploying Renewables," 2011. https://www.iea.org/publications/freepublications/publication/Renew_Policies.pdf
- ⁵² Hawken, Paul, "Drawdown: The Most Comprehensive Plan Ever Proposed to Reverse Global Warming," Penguin Books, 2017.
- ⁵³ U.S. EPA, "The Multiple Benefits of Energy Efficiency and Renewable Energy, Part One," 2011. https://www.epa.gov/sites/production/files/2018-07/documents/mbg_1_multiplebenefits.pdf
- ⁵⁴ Walker, Gordon and Devine-Wright, Patrick, "Community renewable energy: What should it mean," *Energy Policy*, Elsevier, vol. 36(2), pages 497–500, 2008.
- ⁵⁵ Ibid.
- ⁵⁶ White House, Executive Office of the President, "Economic Benefits of Increasing Electric Grid Resilience to Weather Outages," 2013. https://www.energy.gov/sites/prod/files/2013/08/f2/Grid%20Resiliency%20Report_FINAL.pdf
- ⁵⁷ O'Boyle, Mike, "What 'Resilience' Means in a Clean Energy Future," *GTM*, November 29, 2017. <https://www.greentechmedia.com/articles/read/resilience-in-a-clean-energy-future>

- ⁵⁸ Yenneti, Komali, Rosie Day, and Oleg Golubchikov, "Spatial Justice and the Land Politics of Renewables: Dispossessing Vulnerable Communities through Solar Energy Mega-Projects," *Geoforum* C, no. 76 (2016): 90–99. <https://doi.org/10.1016/j.geoforum.2016.09.004> ⁵⁷ Ibid.
- ⁵⁹ Ibid.
- ⁶⁰ Ibid.
- ⁶¹ Ibid.
- ⁶² Farrell, John, "Local Solar Could Solve 'Massive Supply Demand Imbalance' in Renewable Energy Financing," Institute for Local Self-Reliance, 2012. <https://ilsr.org/massive-supply-demand-imbalance-for-solar-and-wind-project-financing/>
- ⁶³ Ibid.
- ⁶⁴ Ibid.
- ⁶⁵ Green, Fergus and Denniss, Richard, "Cutting with Both Arms of the Scissors: The Economic and Political Case for Restrictive Supply-Side Climate Policies" *Climatic Change*, March 12, 2018. <https://doi.org/10.1007/s10584-018-2162-x>
- ⁶⁶ CEA analysis using U.S. Energy Information Administration 2015 data.
- ⁶⁷ International Panel on Climate Change, "Summary for Policymakers," 2013. https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_summary-for-policymakers.pdf
- ⁶⁸ Oil Change International, "The Sky's Limit and the IPCC Report on 1.5 Degrees of Warming," 2018. <http://priceofoil.org>
- ⁶⁹ McGlade, Christophe and Ekins, Paul, "The Geographical Distribution of Fossil Fuels Unused When Limiting Global Warming to 2°C," *Nature* 517, no. 7533 (January 2015): 187. <https://doi.org/10.1038/nature14016>
- ⁷⁰ CEA analysis using U.S. Energy Information Administration data, 2018.
- ⁷¹ Green, Fergus and Denniss, Richard, "Cutting with Both Arms of the Scissors: The Economic and Political Case for Restrictive Supply-Side Climate Policies," *Climatic Change*, March 12, 2018. <https://doi.org/10.1007/s10584-018-2162-x>
- ⁷² Oil Change International, 2014. <http://priceofoil.org/content/uploads/2014/12/KeystoneFailsClimateTest1217.pdf>
- ⁷³ Dembicki, Geoff, "Dakota Access Pipeline protest movement now focuses on the money," *Mashable*, 2017. <https://mashable.com/2017/05/07/dapl-divestment-movement-grows/#76Kpz74tsPqz>
- ⁷⁴ Gamu, Jonathan, Philippe Le Billon, and Samuel Spiegel, "Extractive Industries and Poverty: A Review of Recent Findings and Linkage Mechanisms," *The Extractive Industries and Society* 2 (January 31, 2015): 162–76. <https://doi.org/10.1016/j.exis.2014.11.001>
- ⁷⁵ Ibid.
- ⁷⁶ Green, Fergus and Denniss, Richard, "Cutting with Both Arms of the Scissors: The Economic and Political Case for Restrictive Supply-Side Climate Policies," *Climatic Change*, March 12, 2018. <https://doi.org/10.1007/s10584-018-2162-x>
- ⁷⁷ WECAN, "Visionary 'Living Forest' Proposal To Be Launched by Kichwa People of Sarayaku in Ecuador," 2018. <https://wecaninternational.org/news/1928/press-release-visionary-living-forest-proposal-to-be-launched-by-kichwa-people-of-sarayaku-in-ecuador>
- ⁷⁸ Amazon Watch, "Sarayaku: People of the Zenith." <https://amazonwatch.org/work/sarayaku>
- ⁷⁹ Campbell, Bonnie, "Corporate Social Responsibility and Development in Africa: Redefining the Roles and Responsibilities of Public and Private Actors in the Mining Sector," *Resources Policy* 37, no. 2 (June 2012): 138–43. <https://doi.org/10.1016/j.resourpol.2011.05.002>
- ⁸⁰ Ibid.
- ⁸¹ Samuel, M. and Mqomboti, S., "2016 Model: Imperative for Cultural and Consultative Dimensions," *Journal of African Business* 18, no. 1 (January 2, 2017): 50–69. <https://doi.org/10.1080/15228916.2016.1219174>
- ⁸² Ibid.
- ⁸³ Daley, Jason, "Murder of Environmental Activists Reaches All-Time High," *Smithsonian*, 2016. <https://www.smithsonianmag.com/smart-news/murder-environmental-activists-reaches-all-time-high-180959528/>
- ⁸⁴ Ulmanu, Monica, Georgia Brown, and Alan Evans, "The Defenders: Recording the Deaths of Environmental Defenders around the World," *The Guardian*, September 17, 2018. <http://www.theguardian.com/environment/ng-interactive/2018/feb/27/the-defenders-recording-the-deaths-of-environmental-defenders-around-the-world>
- ⁸⁵ Gamu, Jonathan, Philippe Le Billon, and Samuel Spiegel, "Extractive Industries and Poverty: A Review of Recent Findings and Linkage Mechanisms," *The Extractive Industries and Society* 2 (January 31, 2015): 162–76. <https://doi.org/10.1016/j.exis.2014.11.001>
- ⁸⁶ Rights and Resources, "The Science Is In: Community Governance Supports Forest Livelihoods and Sustainability," 2016. <http://rightsandresources.org/wp-content/uploads/Factsheet-Community-Governance.pdf>
- ⁸⁷ Ospina, Christina, "Reducing Carbon Emissions through Indigenous Land Titles," *Climate institute*, 2018. <http://climate.org/reducing-carbon-emissions-through-indigenous-land-titles/>
- ⁸⁸ Ospina, Christina, "Reducing Carbon Emissions through Indigenous Land Titles," *Climate institute*, 2018. <http://climate.org/reducing-carbon-emissions-through-indigenous-land-titles/>

- ⁸⁹ Stevens, Caleb, Robert Winterbottom, Jenny Springer, and Katie Reyter. "Securing Rights, Combating Climate Change," World Resources Institute, 2014. <https://www.wri.org/publication/securing-rights-combating-climate-change>
- ⁹⁰ Ibid.
- ⁹¹ Christina Ospina, Christina, "Reducing Carbon Emissions through Indigenous Land Titles," Climate institute, 2018. <http://climate.org/reducing-carbon-emissions-through-indigenous-land-titles/>
- ⁹² Rights and Resources, "The Science Is In: Community Governance Supports Forest Livelihoods and Sustainability," 2016. <http://rightsandresources.org/wp-content/uploads/Factsheet-Community-Governance.pdf>
- ⁹³ FAO, "Global Forest Resources Assessment 2015." <http://www.fao.org/3/a-i4808e.pdf>
- ⁹⁴ Ojanen, Maria, Daniel C. Miller, Wen Zhou, Baruani Mshale, Esther Mwangi, and Gillian Petrokofsky, "What Are the Environmental Impacts of Property Rights Regimes in Forests, Fisheries and Rangelands? A Systematic Review Protocol," *Environmental Evidence* 3, no. 1 (2014): 19. <https://doi.org/10.1186/2047-2382-3-19>
- ⁹⁵ Berry, Helen L., James R. A. Butler, C. Paul Burgess, Ursula G. King, Komla Tsey, Yvonne L. Cadet-James, C. Wayne Rigby, and Beverley Raphael, "Mind, Body, Spirit: Co-Benefits for Mental Health from Climate Change Adaptation and Caring for Country in Remote Aboriginal Australian Communities," *New South Wales Public Health Bulletin* 21, no. 6 (2010): 139. <https://doi.org/10.1071/NB10030>
- ⁹⁶ Hall, Gillette. "Poverty and Exclusion among Indigenous Peoples: The Global Evidence," The World Bank, August 9, 2016. <https://blogs.worldbank.org/voices/poverty-and-exclusion-among-indigenous-peoples-global-evidence>
- ⁹⁷ Ibid.
- ⁹⁸ Jandl, Robert, Lars Vesterdal, Mats Olsson, Oliver Bens, Franz Badeck, and Joachim Rock, "Carbon sequestration and forest management," *CAB Reviews: Perspectives in Agriculture, Veterinary Science, Nutrition and Natural Resources* 2007 2, No. 017. <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.554.182&rep=rep1&type=pdf>
- ⁹⁹ Burgess, P, FH Johnston, DM Bowman, and PJ Whitehead, "Healthy country: healthy people? Exploring the health benefits of Indigenous natural resource management," *Australian and New Zealand Journal of Public Health* 2005 29(2):117.
- ¹⁰⁰ Ibid.
- ¹⁰¹ Bayrak, M.M. and Marafa, L.M., "Ten Years of REDD+: A Critical Review of the Impact of REDD+ on Forest-Dependent Communities," *Sustainability* 2016, 8(7), 620. <https://www.mdpi.com/2071-1050/8/7/620>
- ¹⁰² Fern, "Carbon Discredited: Why the EU should steer clear of forest carbon offsets," 2013. https://fern.org/sites/default/files/news-pdf/Nhambita_internet.pdf
- ¹⁰³ Kolbert, Elizabeth, "Gospels of Giving for the New Gilded Age," *The New Yorker*, 2018. <https://www.newyorker.com/magazine/2018/08/27/gospels-of-giving-for-the-new-gilded-age>
- ¹⁰⁴ Giridharadas, Anand, "Winners Take All: The Elite Charade of Changing the World," Knopf, 2018.
- ¹⁰⁵ Robinson, Mary, "Climate Justice: Hope, Resilience, and the Fight for a Sustainable Future," Bloomsbury Publishing, 2018.
- ¹⁰⁶ CLIMA funds provided by CLIMA organizations and general climate funds taken from SDG Funders online (<http://sdgfunders.org/sdgs/dataset/recent/goal/climate-action/>)

