



Getting Climate Finance Right:

Successful Examples for the Green Climate Fund from around the World

A Working Draft

Co-Editors:



IPS is the nation's oldest multi-issue progressive think tank, connecting peace, justice and the environment for 50 years. www.IPS_DC.org. For more information about our work on energy, climate and the Green Climate Fund, please contact Janet Redman, climate policy program director, janet@ips-dc.org.



Friends of the Earth U.S., founded by David Brower in 1969, is the U.S. voice of the world's largest federation of grassroots environmental groups, with a presence in 75 countries. Friends of the Earth works to defend the environment and champion a more healthy and just world. Through our 45-year history, we have provided crucial leadership in campaigns resulting in landmark environmental laws, precedent-setting legal victories and groundbreaking reforms of domestic and international regulatory, corporate and financial institution policies. For more information, please contact Karen Orenstein, senior international policy analyst, korenstein@foe.org.

The Institute for Policy Studies and Friends of the Earth U.S. have been actively engaged in global debates about the role of the Green Climate Fund since its inception, focusing on meeting the needs of those most impacted by climate change while supporting the shift toward a clean energy economy. For the purposes of this paper, we reached out to international networks working on issues of climate-related international financing and asked for existing examples of adaptation and mitigation projects, programs and policies that people felt had been successful. Our aim was to collect a selection of brief 'snapshots' with a diversity of location, size, and sector that could serve as positive examples of the types of activities the Green Climate Fund should support.

We are grateful to the many organizations that provided snapshots, which were edited for clarity and brevity by IPS and FOE staff. In providing examples, no organization is necessarily endorsing the contributions of others. From these cases, and through conversations with contributors, we have attempted to draw out elements that led to project success. This analysis has benefitted greatly from the wisdom of contributing organizations, but the views and opinions expressed – and any errors or omissions—are those of the co-editors and do not necessarily reflect the positions of any contributor.

Contributing Organizations



Many thanks to Josette Matoto, Friends of the Earth US, for her layout prowess.

Cover Photo: Children sit under solar panels in Dharnai. A solar-powered mini-grid is now supplying electricity to the village. © Vivek M. / Greenpeace

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Acronyms

ADB - Asian Development Bank

CBA - Community-based adaptation

CC-CBA - Child-centered community-based adaptation

CSO - Civil society organization

CVCA - Community vulnerability and capacity assessment

DRR - Disaster risk reduction

DfID - Department for International Development, UK

DGIS - The Netherlands Directorate-General for International Cooperation

ESCO - Energy services companies

GEF - Global Environmental Facility

GHG - Greenhouse gas

GIZ - Gesellschaft für Internationale Zusammenarbeit (German Corporation for International Cooperation, formerly GTZ)

HWM - Healthcare waste management

ICT - Information and communication technology

IDA - International Development Association

IDCOL - Infrastructure Development Company, Ltd.

IFC - International Finance Corporation

ISDB - Islamic Development Bank

IWRM - Integrated Water Resources Management

IUCN - International Union for Conservation of Nature

JICA - Japan International Cooperation Agency

KfW - Kreditanstalt für Wiederaufbau (German Credit Agency for Reconstruction)

NGO - Non-governmental organization

NORAD - Norwegian Agency for Development Cooperation

PO - Partner organization

PSP - Participatory Scenario Planning

PV - Photovoltaic

SNV - Netherlands Development Organisation

SWM - Solid Waste Management

TSC - Technical Standards Committee within IDCOL

UNCDF - United Nations Capital Development Fund

UNDP - United Nations Development Programme

USAID - United States Agency for International Development

I. Introduction

With the establishment of the Green Climate Fund (GCF), the international community has a historic opportunity to get climate finance right. Civil society groups have been clear about the kinds of adaptation and mitigation projects they don't want the GCF to finance in developing countries. First and foremost, they don't want money going towards the types of fossil fuel projects that have contributed to climate disruption and other negative environmental and social impacts in the past. But the question of what the GCF should support has received considerably less attention.

Fortunately, there are many positive examples to learn from. This report presents 22 climate-related projects, programs, and policies that organizations from the Global South and North have identified as successful. These examples are drawn from large and small developing countries in Africa, Asia, and Latin America, and are organized into four categories: adaptation, agro-ecology, adaptation/mitigation hybrids, and mitigation. We also draw out some of the common characteristics of these examples, with the hope that the GCF may incorporate these lessons into their financing strategies.

It should be noted that *Getting Climate Finance Right* is not attempting to be a comprehensive review of the field or literature on climate finance. Nor are the co-editors arguing that every project included herein is a perfect example of the types of activities the GCF should support. Rather, the objective is to learn from the wealth of experience of local, national and international organizations that have been deeply engaged in international development, energy and climate finance. We hope this work helps inform the GCF in selecting initiatives for its initial project pipeline to maximize the institution's six investment criteria - impact, sustainable development benefits, ability to meet the needs of recipients, country ownership, efficiency and efficacy.

II. Overarching Characteristics of Positive Examples of International Climate Finance

A multitude of factors generally account for any project's positive performance. In summarizing characteristics of programs, projects, and policies that have effectively helped people in developing countries adapt to and mitigate climate change, *Getting Climate Finance Right* aims not to be comprehensive, but to reflect and weave together the key elements identified by snapshot contributors and the co-editors for project success. While not every case contains each characteristic or theme presented here, the following commonalities have emerged.

Deep, local roots with active, inclusive participation of affected communities, with special attention paid to the most vulnerable. Many successful projects:

- Responded to community-identified needs with climate action that was community-driven (initiated, developed, implemented and monitored).
- Engaged broad networks with deep, local roots.
- Hinged on relationships of trust, with community members in leadership roles and as project promoters.
- Built local capacity and created new community-run institutions.
- Engaged local and domestic, as opposed to international, private sector actors.
- Adapted local knowledge, tools and technologies rather than imposing outside ideas,

and relied on community resources.

- Took local governance modalities into account and ensured buy-in from local governing bodies and regulatory authorities prior to implementation.
- Tailored solutions appropriate to local contexts to meet end-users' needs, in the context of broader development needs.

Recognition and respect for people's rights, including the poor and vulnerable. This included, in many cases, the right to community control over resources (like land, water and forests), and the promise that all members of a community share equitably in project benefits. These fundamental principles of equity, access and control are part of the right to self-determination of local communities.

Gender. A gender-responsive approach should be baked into the core of a project.

Multiple benefits. Many projects had tremendous social and environmental benefits that extended well beyond climate change. Mainstreaming community-based climate adaptation and mitigation approaches into local development planning led to project (co-)benefits, such as high quality electricity, clean water, nutritious food, skills and capacity, new technologies, capital/financial wealth, etc. It also helped ensure that these benefits stayed within the community. Using an integrated approach to climate-related programming and policy, many successful projects explicitly aimed to address climate change as one of the underlying causes of poverty. They often improved people's quality of life by building overall resilience, especially of vulnerable communities.

Relationship-centered approaches that emphasize partnerships. Many snapshots pointed to meaningful collaborations between local and national government, civil society, workers, financing institutions, developers, and academia as key to achieving positive outcomes. Success was built on bridging the gap in power relations and knowledge between duty-bearers and rights-holders, and engaging the private sector in stakeholder empowerment strategies. Also important were decision-making structures that included the participation of CSOs, private sector and the public, with processes for transparent multi-stakeholder decision making at each stage of a project. In one example, a credible local organization, legal and policy frameworks, the receptive inclination of the municipal administration, support of elected representatives, and the presence of a strong, formal municipal employees union were key to success.

Using a partnership approach that links organizations that directly implement interventions with policy-oriented organizations helps ensure that policy actions at the national level are locally relevant, that local issues are brought to national and global fora, and that both local and international knowledge are leveraged for maximum impact and sustainability. One project credits, in part, the alignment of institutions, policy and regulation in catalyzing billions of dollars in multilateral climate finance.

Capacity building and technical assistance are essential for finance to work. This includes supporting communities with a range of skill and capacity building and training, including activities that support the development of the local workforce, enterprises and supply chains. Technical assistance and capacity building that engaged broad networks of partner NGOs, microfinance institutions (where relevant), and other entities with deep local networks help lay the groundwork for relatively rapid growth and scale-up in many cases. Assistance to domestic

private sector actors for addressing technical, market, legal, and regulatory barriers, as well as capacity building for lending/financing institutions, was central to the success of some projects, particularly larger ones.

Small is beautiful, and it's even prettier when it's scaled up. Most of the projects highlighted as successes in the accompanying snapshots were small (in GCF terms, less than US\$50 million).¹ In some places, small-scale demonstration projects implemented with key stakeholders at the table played an important role in giving local and national actors hands-on experience with technologies and methodologies that led to greater results being achieved in the long term. Indeed, most of the medium- and large-scale projects considered successful in these snapshots consisted of policies or programs that supported the aggregation of smaller-scale activities, showing that bundling smaller projects can lead to big change. Engaging state-owned development financial institutions in bundling investment, operating and maintenance costs was seen in some cases as critical to this approach. Supporting the role of communication to encourage wider replication of successful initiatives was also cited as important to reaching scale.

Open and transparent. Maximizing transparency improved effectiveness, was important for engagement and support at multiple levels (community, state and international), and helped attract appropriate investment. In particular, aggregating smaller projects to increase impact and gain economies of scale requires transparent evaluation of the merits of each individual project. Bundling should not be used to hide subpar projects.

Policy - If you build it, they will come. Having appropriate policies and regulatory frameworks in place are essential for long-term financial, social and technical sustainability. Such frameworks are critical to drawing in finance. In many cases, even a modest investment in policy and institutional reform, coupled with political will, had a significant multiplier effect by creating an enabling environment. As with many renewable energy projects included here, policies were needed to remove market, institutional, financial, technological and social barriers that were inhibiting commercially viable investments. This type of policy de-risking approach is capable of catalyzing much greater investment over time than, for example, a standalone one-off investment in a wind power project. In some cases, performance-based incentives for local private sector developers and appropriate timing of subsidy phase-out were seen as important elements of success.

Grants. Most of the projects profiled are either fully grant-funded or have grants as major components. Grants allowed for flexibility, experimentation and innovation – important factors in funding paradigm-shifting activities that address climate change in the context of sustainable development.

For projects that expect returns, access to large pools of credit and up-front capital enabled more rapid expansion – and was absolutely critical for projects with high upfront capital expenditures, like renewable energy systems. In some cases, projects benefitted from reflows being reinvested to catalyze additional deployment of successful activities.

Funding volume. The amount of financing provided was not necessarily a good indicator of reach or impact. For example, agro-ecology projects tend to utilize low cost technologies and approaches compared to kinds of interventions. Thus, using the GCF classifications of small, medium and large (which are based on funding volume) is not necessarily a good way to measure the size and impact of these projects.

¹ \$250 million for an individual project or an activity in a program. (From “fit-for-purpose” accreditation approach, Decisions of the Board - Eighth Meeting of the Board, 14-17 October 2014, Annex I)

Adaptation Learning Program for Africa

Location: Ghana, Mozambique, Niger, Kenya and Africa regions

Project type: Adaptation, rural development

Financing amount: US\$18 million from 2010 to 2017 (two phases, 2010-2015 and 2015-2017)

Financial instrument: Grant

Institutional arrangements: Funding from developed country donor institutions - UKAid (DFID), Government of Finland, Austrian Development Agency, Danish Ministry of Foreign Affairs and Denmark's Climate and Environment Fund. Implemented by CARE International in collaboration with local and national governments and civil society partners.



Photo credits: Dela Jari, ALP community early warning volunteer, reading the rain gauge in Aman Bader village, Dakoro Niger. Photo by Agnes Otzelberger. 2015.

Project description: The Adaptation Learning Programme (ALP) for Africa develops, implements and disseminates approaches for community-based adaptation (CBA) to climate change in Ghana, Niger, Mozambique and Kenya across a range of climate-vulnerable livelihood groups, agro-ecological zones and climates (particularly drylands). In each country, CBA is tested and demonstrated together with vulnerable communities, local civil society and government institutions.

At its core is a focus on learning, monitoring and generating lessons to inform CBA practice and policy in Africa and globally. The experience gained is shared with civil society organizations and used to influence adaptation planning, policies and programs at national, regional and international levels through targeted advocacy. In particular, ALP has shared its grassroots experience in the application of CBA to advocate for adaptation financing that is available and accessible to rural poor people. ALP promotes the replication and scaling up of successful CBA approaches by governmental and non-governmental institutions engaged in planning and implementing adaptation initiatives.

CARE's [CBA Framework](#) covers a range of enabling factors that need to be in place for effective community-based adaptation to occur. These are achieved through the use of four interrelated strategies: (1) promotion of climate-resilient livelihoods strategies; (2) disaster risk reduction strategies (DRR) to reduce the impact of hazards on vulnerable households; (3) strengthening community adaptive capacity and capacity of local civil society and government institutions; and (4) advocacy and social mobilization to address the underlying causes of vulnerability and influence the policy and enabling environment. In all of these strategies, adaptation planning and action are informed by climate information, knowledge, risk and uncertainty.

Results: The ALP has provided rigorous evidence that CBA works. Economic research conducted by the New Economics Foundation as part of the program found that investing in CBA could generate between 1.5 and 3 times as much wealth as the investment costs of

the project.¹ This suggests that it should become a priority, both in national development budgets and in international finance for climate change adaptation.

The program's mid-term DfID review (2013)² demonstrates some of the mid-term accomplishments. (The final evaluation report is expected in July 2015.)

- Increased numbers of people supported to diversify livelihoods strategies, for example through scaling up village savings and loans associations in Ghana, which are used for agricultural inputs and small enterprise development and promotion of conservation agriculture techniques through farmer field schools in Mozambique.
- Uptake of Participatory Scenario Planning (PSP) climate communication models across all counties in Kenya via the Kenya Meteorological Service and in ALP sites in Ghana which support informed decision-making on livelihoods and DRR actions.³
- Improved DRR plans in all four countries, including using information disseminated in PSPs to improve early warning systems and planning, for example, in Kenya, where losses from floods during the 2013 rainy season were minimized due to preparedness activities.
- Shifts in gender dynamics in all ALP communities, including integration of women into traditionally male-only livelihood activities, greater involvement of women in decision-making and planning and increased access to land and resources.
- Integration of CBA into local plans and national adaptation strategies in all ALP countries, and national development planning guidelines in Ghana, where ALP has trained Planning and Budgeting Officers in all 206 Municipal, Metropolitan and District Assemblies on CBA.
- Learning and training events are leading to outreach and replication with other organizations in all ALP countries and beyond, demonstrating a growing appreciation and demand for CBA. Most recent publications from the ALP provide practical guidance for undertaking adaptation planning with communities.⁴⁵

*For more information on this project, please contact Sven Harmeling, CARE,
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¹ New Economics Foundation, *Counting on uncertainty: The economic case for community based adaptation in North-East Kenya*, 2012. www.careclimatechange.org/files/adaptation/Counting_on_Uncertainty_July12.pdf; Olivier Vardakoulias and Natalie Nicholles, 2014: *Managing uncertainty: An economic evaluation of community-based adaptation in Dakoro, Niger*. http://www.careclimatechange.org/files/Managing_Uncertainty_CARE_nefc_email_version.pdf

² http://www.careclimatechange.org/files/Adaptation_Learning_Programme_2013Review_Final.pdf; see also 2014 DfID annual review: iati.dfid.gov.uk/iati_documents/4776306.docx

³ CARE, 2011: *Decision-making for climate resilient livelihoods and risk reduction: A Participatory Scenario Planning approach*. http://www.careclimatechange.org/files/ALP_PSP_Brief.pdf

⁴ CARE, 2015: *Community Based Adaptation: An empowering approach for climate resilient development and risk reduction*. http://www.careclimatechange.org/files/CBA_Brief_ALP_English.pdf

⁵ CARE, 2015: *Adaptation planning with communities. Practitioner brief 1*. http://www.careclimatechange.org/files/CBA_Planning_Brief.pdf

Adaptation to Climate Change in the Water Sector

Location: Dayi River Basin, Southeast Ghana

Project type: Adaptation, riparian communities

Financing amount: €700,000

Financial instruments: Grant

Institutional arrangements: Funded by the Dutch Ministry of Foreign Affairs. Implementers and partners include the Ghanaian Ministry of Agriculture, Water Resources Commission, Districts and Regional Administrations, Ghana Vegetable Exporters Association, Volta Vegetable Producers Association/ADAPTS Farmers Network, Both ENDS, The Development Institute, Free University and Acacia Water

Project description: The main goal of the project is to increase adaptive capacities in Ghana through the inclusion of climate change and local adaptation considerations in water policies and investment decisions. To achieve this goal, a three-pronged approach was used:

- (1) *Knowledge development*, using both scientific studies and local knowledge
- (2) *Local action*, which involved empowering 12 communities in the Dayi River Basin on rights and water governance, engaging duty-bearers (i.e. government agencies with a task to provide specific duties to citizens), building awareness and sensitization on climate change challenges, and implementing adaptive measures based on the results of knowledge development and consultation with farmers. The main adaptive measures were to transition from rain-fed agriculture to small-scale irrigation, market-orientated vegetable production and the introduction of quick-growing, drought-resistant but high-yielding crop varieties of maize and cassava.
- (3) *Dialogue*, including facilitation of multi-stakeholder platforms to discuss mainstreaming and implementing climate change considerations into Integrated Water Resources Management (IWRM) for the Dayi River Basin and other river basins in Ghana.

Results: 1,200 farm families directly benefited from this project through increased resilience to climate change. By transitioning from rain-fed to irrigation agriculture, and adopting market-oriented vegetable production - including linkages to the export market - these families grew their annual incomes from €500 to €2,000.

A functioning water board, the highest-level decision making body for water management in Ghana, was established for the Dayi River Basin. For the first time, this board consists of ordinary users - farmers, women, traditional authorities and civil society organizations. A Dayi River Management Plan has been developed that incorporates climate change concerns in the management of water resources in the basin. At the national policy level, climate change concerns are now being mainstreamed into river basin plans. The Water Resources Commission has replicated the program's three-pronged approach (knowledge development, local action, dialogue) at the country scale in the National IWRM.

The program helped increase understanding of the buffer zone policy and its adoption along water channels, and the importance of buffer zones in reducing soil erosion and siltation of riverbeds during heavy and intense rainstorms and associated flooding. Streams and rivers have returned as a result of watershed protection through natural regeneration and enrichment planting. This has increased the enthusiasm of communities to return to cocoa and coffee production and has increased the biodiversity of the basin.



Photo credit: Ken Kinney, The Development Institute

The success of the project can be attributed to:

- Ensuring the participation of all interest groups through facilitation of a multi-stakeholder platform from the outset of the project - with knowledge development, selection of adaptation measures and dialogue.
- Establishing a decision-making body that included the participation of CSOs, private sector and the public. This brought on board all issues for inclusive decisions.
- Bridging the gap in power relations and knowledge between duty-bearers and rights-holders (in this case, community farmers) and engaging the private sector in a stakeholder empowerment strategy. The project ensured that discussions were focused on the common challenge of climate change, the common needs for water resources and the necessity of collaboration to meet both.
- Establishing sustainable governance structures, in this case, in the form of a Water Board and the Dayi River Basin Management Plan.

*For more information about this project, please contact Ken Kinney,
The Development Institute, kkinney@thedeivin.org.*

Community Mangrove Biodiversity Conservation through Awareness-Raising, Education and Restoration

Location: Penang, Malaysia

Project type: Community-based adaptation, mangrove protection/rehabilitation

Financing amount: US\$50,000 over 2 years

Financial instrument: Grant

Institutional arrangements: Funded by GEF, Small Grants Programme Malaysia. Implemented by UNDP. In-kind contributions by communities and NGOs guiding the grantee and assisting in reporting.

Project description: Mangrove protection, conservation and rehabilitation contribute to resilience to the effects of climate change in coastal zones. In addition, mangroves, among the most carbon-rich forests in the tropics, are carbon sinks. Vulnerable groups - like coastal fisher communities who would be subjected to sea-level rise - have to be prepared for the impacts brought about by climate change. Even minor changes could have disastrous impacts on the lives and livelihoods of people in these communities. Regions where the coastal fringe forests have been cleared are already experiencing increased erosion and the loss of human life and property from destructive tsunamis and storms.

The Penang Inshore Fishermen Welfare Association (PIFWA), the community-based organization which carried out the project, believes that it is important to communicate the values and functions of coastal ecosystems to the public at large and fishers, their families and coastal communities in particular. Armed with this basic understanding, people will be willing and able to conserve and maintain the sound-use of coastal ecosystems. The involvement of local communities is critical to foster a sense of ownership and nurturing. By living and working near the mangrove area, community members have an advantage in monitoring resource use and the health of replanted mangroves - both of which are important for long-term sustainable management of wetlands resources.

The project aimed to facilitate adaptation to climate change, raise awareness and build capacity for mangrove conservation through active community participation. PIFWA conducted educational programs to promote environmental awareness, focusing on mangrove conservation among young children and youth. Among the activities carried out were mangrove replanting programs, exhibitions and talks imparting the importance of wetlands, the establishment of a mangrove education center, participatory monitoring and training programs for fisher families on the sustainable use of wetland resources to for food products.

Results: PIFWA began replanting mangrove trees in 1997, and has planted more than 200,000 mangrove saplings in the state of Penang to date. They have also guided other coastal communities in mangrove rehabilitation programs. The value of replenished mangroves in storm protection and flood control alone has been estimated at US\$300,000 per km of coastline.⁶

Over the two years of this project's implementation, approximately 3km² of mangrove forest were rehabilitated. The estimated value of coastal protection derived from the program is about US\$1 million (excluding other ecosystem services derived from this area). Training for fisher families on the sustainable use of wetland resources has enabled them to supplement

⁶ Estimate based on the equivalent cost of installing rock wall flood control (Ramsar Secretariat, 2001). Mangrove forests in Peninsular Malaysia support a fishery worth US\$250,000/km²/year (UNEP-WCMC, 2006).

their income by wisely using mangrove plants, for example, for making edible products or crafts. In addition, coastal communities are now more aware of the protection afforded by mangroves. PIFWA's experience illustrates that a truly grassroots initiative borne out of awareness and realization of the value of environmental stewardship can bring about effective results in protecting the environment and sustaining livelihoods.

For more information, please contact Mageswari Sangaralingam, Consumers' Association of Penang, magesling@gmail.com.



Left: School children planting mangrove saplings - guided by PIFWA Right: Exhibition by PIFWA to raise public awareness on importance of mangroves Photo credit: Penang Inshore Fishermen Welfare Association

Child-Centred Climate Resilience Program



Above: Primary school children creating their climate change storybooks. Photo credit: Save the Children.

Location: 7 provinces in the Philippines and Vietnam

Project type: Child-centered community-based adaptation

Financing amount: US\$4.7 million over 3 years

Financial instrument: Grant

Institutional arrangements: Funding from Australian Aid, now the Department of Foreign Affairs and Trade, implemented jointly by Save the Children and Plan International.

Project description: Underpinned by a participatory and rights-based approach, the program aims to build the adaptive capacity of children and communities to manage the impacts of climate change and ensure that national and local governments support and integrate local level initiatives into their policies and programs. Program funding has been used to facilitate dialogue, analysis and planning for adaptation, and has also been channeled directly to communities to implement the adaptation actions they chose to prioritize.

The Child-Centred Climate Resilience Program began in 2012 and has the following objectives:

Philippines: (1) Increasing the resilience of children, youth and their communities to the impacts of climate change across 40 barangays (local councils); and (2) Strengthening the evidence base within the Philippines for child-centered community-based adaptation (CC-CBA) in order to inform policy and practice.

Vietnam: (1) Increasing the ability of children and their communities to directly plan for and manage the negative impacts of climate variability and change; and (2) Improving the ability of government and civil society to meet the adaptation needs of children and their communities, in line with national objectives.

Results: 53 small action grants were awarded to enable communities and children to implement their own adaptation projects. More than 35,000 children, teachers, community members, local civil society organizations and government officials were reached.

Through the process of Community Vulnerability and Capacity Assessments (CVCAs), communities, government officials, children, teachers and project staff worked together to analyze the hazards of – and their vulnerability and adaptive capacity to – climate change. Based on the outcomes of the CVCAs, the projects provided opportunities for children, schools, community members and local government units to apply for small grants to help them implement some of the prioritized climate change adaptation actions. This included initiatives such as mangrove reforestation, the development of climate-sensitive livelihood opportunities with out-of-school youth, and the development and implementation of child-centered climate change advocacy plans with elementary and secondary school students. This enabled children and community members to design, implement and monitor their own interventions. The process of defining adaptation options was reviewed, scrutinized and technically supported by relevant local government technical offices.

The success of this program has led local government units in the Philippines and Vietnam to integrate a number of CC-CBA activities from the project into their respective Annual Investment Plans and Socio-Economic Development Plans with the aim of implementing additional small grant opportunities in the future.

Evaluation of the program have highlighted that success is dependent on five mutually supportive areas of intervention:

- Ensuring children’s voices are heard in community-based adaptation so that the needs and capacity of children are reflected in adaptation approaches;
- Building the resilience of vulnerable communities to support a diversification of climate-sensitive livelihoods;
- Mainstreaming CC-CBA approaches into local development planning;
- Supporting children to be agents of change; and
- Supporting the role of communication to both mobilize action and encourage wider replication of initiatives.

For more information, please contact Corinne Schoch, Save the Children Australia, corinne.schoch@savethechildren.org.au.

Increasing Food Security and Resilience to Climate Shocks



Photo credit: Margret Masanga, Trócaire, Zimbabwe

Location: Malawi, Zimbabwe

Project type: Adaptation, sustainable agriculture, access to water, climate change policy

Financing amount: GBP£ 2.1 million (Oct 2014 - Sept 2017)

Financial instruments: Grant

Institutional arrangement: Department for International Development's UK Aid Match awarded Trócaire GBP£ 2,089,792, matching GBP£2,089,792 raised by Trócaire's Ireland-based Lent fundraising campaign in 2014 (used for other projects). The program finances Trócaire, the international NGO coordinating the program, and six partner CSOs. Four CSOs work directly with community women and men and an additional two groups (one each in Malawi and Zimbabwe) work in collaboration with Trócaire, the 6 partner CSOs and the relevant government ministries in the two countries to deliver national and international climate justice campaigns. The program also supports work with and collaboration between three universities in Zimbabwe, Malawi and Ireland to engage students in issues of climate change.

Project description: Trócaire and its six CSO partners are implementing a three-year program working with women and men small-scale farmers in 5,370 households in rural Zimbabwe and Malawi. These vulnerable households are significantly impacted by climate change because of their reliance on agriculture for food and income, low levels of crop diversification and value addition, and minimal access to water for irrigation.

The program supports increased access to water through the restoration of catchments, use

of in-field water conservation techniques, and the development and upgrading of irrigation schemes. The program also aims to increase production through the prioritization of drought tolerant/resistant crops and application of sustainable agriculture techniques, and increase diversification to decrease families' dependence on drought-sensitive maize. In addition, households are supported to diversify their income sources, with a focus on supporting income generating, marketing and value-adding activities, thereby reducing vulnerability to climate-related production shocks.

These material results are complemented by work to advance climate-related policy frameworks in Zimbabwe, Malawi and internationally with the goal of supporting small-scale female and male farmers to build resilience and increased ability to adapt to climate shocks. This project acts to shape the policy agenda and ensure that the effects of climate change are communicated to policy makers at national and international levels so that adequate provisions are put in place to protect the most vulnerable. Specifically, the program is supporting the development of a climate change policy in Zimbabwe and the finalization of a climate change policy in Malawi where a draft already existed. In addition, the Malawi program will also support the drafting of an agriculture policy and finalization of the national disaster risk reduction strategy. This work will be supported by leading edge research.

Results: Given that the program is less than a year old, reporting results is challenging. However, it does serve as a positive example of an integrated approach to climate-related programming and policy by explicitly aiming to address climate change as one of the underlying causes of poverty while empowering vulnerable women and men to adapt to –and recover from–its effects. Using a partnership approach that links organizations that directly implement interventions with policy-oriented organizations helps ensure that policy actions at the national level are locally relevant, that local issues are brought to national and global fora, and that both local and international knowledge are leveraged for maximum impact and sustainability.

For more information, please contact Nelly Maonde, Trócaire, nelly.maonde@trocaire.org, or visit www.trocaire.org.

Women-centered, Locally Controlled, Resilient Food Production

Location: 75 villages in the Medak District of Andhra Pradesh, India

Project type: Community-controlled agricultural land conversion, seed diversity, natural resource management

Financing amount: US\$445,628; including US\$359,025 from foreign donors and US\$86,603 from donors within India

Financial instruments: Grant

Institutional arrangements: Deccan Development Society, an Indian NGO, is the primary operational entity. Support came from the Indian Council of Agriculture Research, Ministry of Environment and Forests, and Ministry of Health and Family Welfare. Additional support came from Swallows (Sweden), Hivos (the Netherlands), Interparas (Canada), Misereor (Germany), EED (Germany) and Christian Aid (UK).



Photo credit: Deccan Development Society photo gallery, <http://ddsindia.com/www/default.asp>

Project Description: The Deccan Development Society (DDS) is a grassroots organization working in about 75 villages with women's Sanghams (voluntary village level associations of the poor) in the Medak District of Andhra Pradesh. The 5,000 women members of the DDS represent the poorest of the poor in their village communities. DDS programs provide a strong political voice for rural women. What started off with the intention of ensuring the simple sustenance needs of Sangham members has become an empowering tool to address the larger issues of food security, natural resource enhancement, education and health needs of the region - all of which increase climate resilience for the region.

At the heart of DDS programs are the fundamental principles of access and control, which lead to the autonomy of local communities. This includes autonomy over food production,

seeds, natural resources, markets and media. Future efforts are focused on seed sovereignty through the principles of permaculture, establishing eco-insurance, and production of biomass to enhance soil fertility.

Results: DDS activities aimed at increasing climate resilience have had significant results. The DDS Sanghams have been able to bring back under active cultivation over 10,000 acres of degraded agricultural land, and are now raising over three million kilos of grain every year - more than six times their previous production. They have designed and managed an Alternative Public Distribution System based on strategies of local production, local storage and local distribution to create a series of Community Grain Funds. Within this program, about 3,000 women in 50 villages have increased productivity on more than 3,500 acres of previously fallow or marginal land. They now grow more than a million kilograms of additional sorghum each year. Over 1,500 women farmers of the DDS Sanghams have established village level Community Gene Funds in 60 villages and have revived over 80 traditional crops. In addition, the DDS has regenerated over 1,000 acres of common land in and around villages by raising neighborhood forests. In 28 villages, participants have planted over one million trees. They have also created 30 Village Medicinal Commons, growing over 60 different species of medicinal plants, which they use in their traditional healthcare system.

For more information, please contact ddshyderabad@gmail.com or visit <http://ddsindia.com/www/default.asp>.

Soil, Food and Healthy Communities

Location: Northern and central Malawi

Project type: Farmer led agro-ecology

Amount of financing: US\$2.4 million over 5 years

Type of financial products or instruments: Grant

Institutional arrangements: Soil, Food and Healthy Communities, a Malawian NGO, is partnering with a consortium including the University of Malawi (Chancellor College), University of Manitoba, Western University, and Cornell University as part of the Malawi Farmer-to-Farmer Agroecology project. The Government of Canada, Department of Foreign Affairs, Trade and Development's Canadian University Partnerships program has granted US\$2.04 million over 5 years to Western University as lead partner. Cornell University's Atkinson Center for a Sustainable Future has given a research grant of US\$145,000 to Cornell as lead partner for developing a participatory farmer-led integrated curriculum. Presbyterian World Service and Development and Canadian Foodgrains Bank have donated US\$203,784 over 5 years.

Project description: Soil, Food and Healthy Communities (SFHC) is a farmer-led NGO that experiments with, and teaches about, agro-ecology and farmer-led research to improve food security and nutrition. The initial focus was a participatory research project to test whether legume diversification can improve food security, soil fertility and child nutrition. It has expanded to incorporate an agro-ecological approach more broadly, including agroforestry, mulching and animal manure use. The project has shown improvements in child nutrition, food security, climate adaptation and soil management for smallholder farming families, and has many peer-reviewed scientific publications.

The project uses a participatory research model. Farmers do their own experiments and teach other farmers about their findings. The goal is to support rural Malawians in building sustainable, healthy, equitable, resilient communities by using farmer-led, ecological approaches to farming. The project helps participants address economic and social inequalities at multiple levels (household, community and national) by encouraging the practice of local indigenous knowledge and democratic processes.

Results: This highly successful project has integrated climate adaptation strategies into the project's end goals of improving child nutrition, food security, and soil fertility, with an emphasis on community-based, participatory methods. Key climate adaptation strategies include improving soil fertility and shifting diets toward new crops. Specific activities from the project include:

- *Seed distribution and new participant training* - Distributes legume seed to farmers, provides training on legume plant spacing, crop residue incorporation, and food preparation.
- *Field days* - SFHC farmers invite other farmers and farmer organizations, hospital staff, government, and media to visit successful fields. The May field day attracted 2,500 people.
- *Recipe days* - Promotes and demonstrates a diversified diet with different nutritious recipes using legumes from the project.
- *Farmer exchange visits* - Encourages farmers to learn from and share with each other. A small group of farmers is chosen from a village to go to another village in the region.
- *Agriculture and nutritional discussion groups* - Integrates agriculture, health, gender and social relations to adapt legume systems at a household level.
- *Crop residue promotion days* - Demonstrations are held in various villages to promote the burial of crop residues to improve soil organic matter and soil fertility for future crops.

For more information, please contact Laifolo Dakishoni, sfhc@gmx.com, or visit <http://soilandfood.org/>.

Promoting Organic/Natural Farming among Indigenous Communities and Farmers in Malaysia for Climate Change Adaptation



Orang Asli in Tasik Cini, Pahang learning to do pit composting and going through publications on natural farming, herbal plants during a training programme. Photo credit: Consumers' Association of Penang.

Location: Malaysia

Project type: Community-based adaptation, agro-ecology

Financing amount: US\$50,000 for one year

Financial instrument: Grant

Institutional arrangements: Grant to implement the project from Third World Network, an NGO, to Consumers' Association of Penang (CAP), an NGO that promotes organic agriculture, urban farming and natural farming.

Project description: The project aimed to promote agro-ecological practices for adaptation to climate change through organic and natural farming⁷ among indigenous communities and farmers in Malaysia. The current agriculture model - which includes mass land clearing for monoculture crops, use of chemical fertilizers and pesticides, and intensive use of water and energy - is highly unsustainable and is damaging the resource base on which agriculture depends, as well as contributing to climate change. The main features of agro-ecology include maintaining soil fertility through organic measures and reducing dependence on synthetic inputs. Agro-ecology methods work with nature by imitating the way nature functions, protecting and rationally using natural resources and agricultural biodiversity, promoting animal breeding methods that better cater to the animals' needs, adapting to the local environment, and diversifying modes of operation. Agricultural biodiversity is closely linked to improved resilience to climate disasters.

The project objectives were to build the capacity of farmers and indigenous communities and enhance public awareness of organic/natural farming. Several training programs were conducted in agro-ecology for the public, indigenous and farming communities in Malaysia. Demonstration and pilot projects imparted a variety of methods of composting, vermicomposting, preparation of natural growth promoters, herbal pest repellents, integrated farming, and mixed cropping to target groups. Tools such as guidebooks, videos, exhibits, stories of successful kitchen gardening initiatives, community gardening, and small-scale farming were also used to help mainstream agro-ecology.

⁷ Most small-scale natural farmers do not use agro-chemicals in their farming but are not certified as organic.

Results: Farmers and indigenous communities who underwent the training conducted farming practices that enhanced biodiversity, which then allowed farms to mimic natural ecological processes, enabling them to better respond to extreme weather events and reduce risks associated with climate change impacts, such as drought or flooding due to more frequent and intense rain.

Over a span of four years, CAP has provided information to about 400 farmers and 11 indigenous communities (comprised of about 300 indigenous families) to help them move towards chemical-free farming using agro-ecological farming methods. The capacity building training and follow-up activities have resulted in 42 farmers and community groups converting, or beginning the process of converting, to chemical-free farming using various agro-ecological approaches. The area covered is at least 180 acres (about 73 hectares). Further, the farming communities agree that it is cost-effective to prepare organic growth promoters and pest repellents, as the inputs are either very cheap or available for free from their farm and local surroundings.

For more information, please contact Mageswari Sangaralingam, Consumers' Association of Penang, magesling@gmail.com.

Climate-resilient Agricultural Production Systems for Small and Mid-sized Farmers



Photo credit: National Association of Commercialization Enterprises del Campo Civil Association: https://www.facebook.com/permalink.php?story_fbid=10152739529266316&id=117351541315

Location: Four regions and 10 states in Mexico

Project type: Sustainable agricultural production systems for small and medium-sized farmers

Financing amount: US\$324,550

Financial instrument: Grant

Institutional arrangements: The National Association of Rural Commercialization Enterprises (ANEC) was awarded US\$324,550 by GEF, with counterpart funds committed by the Mexican Ministry of Agriculture. Project partners include the National Coordinator of Coffee Organizations, the National Front of Basic Grain Producers, the National Integrative Agency of Self-insurance Funds, and the Agricultural and Livestock, Agro-ecology Department at Chapingo University.

Project description: ANEC, founded in 1995, brings together more than 220 local groups organized into 10 regional networks of small- and medium-sized farmers of basic grains (predominantly maize, beans, rice, wheat, and sorghum). It is building a new model of agricultural production that is sustainable, climate-resilient, profitable, grounded in gender and generational equity, and peasant-driven.

ANEC has built a successful model for agricultural productivity and sustainable management of agricultural land that is low carbon, highly resilient, and preserves agricultural biodiversity. The model - which translates into "model of peasant agricultural knowledge integrated into complex systems" (commonly referred to by its Spanish acronym: ACCI) - has four main elements: 1) knowledge from traditional peasant agriculture; 2) genetic improvement of plants; 3) agro-ecological practices; and 4) participation of field scientists. The ACCI model uses diversified agricultural production without external inputs (synthetic pesticides or fertilizers) to increase productivity, reduce costs and greenhouse gas emissions, sequester carbon, increase resilience, and preserve agro-biodiversity.

Future aspects of this project will focus on creating the infrastructure to expand the ACCI model to processing, packaging, and production. ANEC will develop protocols and systems for others to replicate the ACCI model - and create an ongoing system of collaboration between ANEC, participating organizations, and committed scientists.

Results: The ACCI model has been adopted by 30 peasant organizations from 7 states with excellent results for maize, wheat, rice, beans, sorghum, sugar, coffee, and tomatoes. ANEC is further shifting agricultural production for its member organizations toward climate resilience and low carbon emissions by expanding the ACCI model to four regions and 10 Mexican states. It will involve 60 local and regional organizations, comprising about 100,000 hectares in 4 production systems according to regional resources. Local and regional organizations and producer-members will develop a plan to adapt and implement the ACCI model to include improved local seeds, integration of traditional agro-ecological practices, soil organic matter enrichment (beddings, compost), crop rotations, cover crops, rainwater capture, and natural fertilization. By utilizing natural fertilization and building soil organic matter, this project will contribute to climate mitigation. Improving local seeds, diversifying crops and better managing water will contribute to climate adaptation.

For more information, please contact Victor Suarez, ANEC, victor.suarez@anec.org.mx, or visit <http://www.anec.org.mx/>.

Community level climate adaptation in agriculture and energy

Location: Rural Tanzania

Project type: Community level climate adaptation to ensure food and energy security

Amount of financing: US\$2.4 million over 32 months

Financial products or instruments: Grant

Institutional arrangements: The Tanzania Institute of Rural Development and Planning led this project. Dodoma Municipal Council was a project partner. Funds from the European Development Fund were administered by the Tanzanian Ministry of Finance and Economic Affairs. The European Union Global Climate Change Alliance was an international partner. Tanzanian NGO partners included Dodoma Environmental Network, Hombolo Agricultural Research Institute, Maji na Maendeleo Dodoma, and Tanzania Organic Agriculture Movement.

Project description: Climate change is directly affecting the most vulnerable populations of Tanzania, often in rural, remote, drought-prone, and food insecure areas. More than 80 percent of the population depends on rain-fed agriculture for their livelihoods. The country has already faced six major droughts in the last 30 years. The Tanzania National Climate Change Strategy has identified agriculture, rangelands, water and forestry as some of the most affected sectors. Women in particular are bearing a heavy burden from climate impacts.

The Chololo EcoVillage was a 32-month project launched in September 2011 to build climate adaptation and mitigation practices. An expansion of the project was recently approved in March 2015. The Chololo Ecovillage helps empower communities to apply a wide range of climate adaptation innovations in agriculture, livestock, water, energy and forestry. The project provided practical solutions to climate challenges as it worked across sectors.

To prepare for the project, a multidisciplinary team visited three rural villages in Dodoma and identified major climate vulnerabilities: drought, deforestation, flooding and strong winds, human diseases, livestock diseases and crop pests, and inadequate ground water recharge.

To address these challenges, the Chololo Ecovillage adopted a number of agricultural practices - often adapting traditional approaches. These approaches included delayed planting to deal with shifts in the rainy season, soil water conservation measures, farmyard manure to improve soil fertility, improved seed varieties of maize, sorghum, millet, cowpeas and groundnuts, optimizing plant populations, improving community seed production, intercropping, and crop rotations.

Results: Climate-adapted traditional agricultural practices have more than doubled yields during the short time of the project. The project also has shifted how farmers manage livestock - which has often had a negative impact on natural resources through overgrazing and competition for scarce water resources. Now, oxen are used to prepare land for planting, farmyard manure helps to fertilize the soil, and improved breeds of cattle, goats and chickens are producing more meat and eggs. Improved beekeeping has tripled honey production, and even small-scale fish farming has had some success. All aspects of the project have aided climate resilience, particularly by improving soil, increasing food production for the community, and improving water management.

For more information, please contact Dr. Francis Njau, Chololo Ecovillage, frabe59@gmail.com or visit <https://chololoecovillage.wordpress.com/>.

Community-based adaptation and mitigation through small grants, Southeast Asia

Location: Indonesia, Philippines

Project type: Community-based adaptation and mitigation small grants facility

Financing amount: US\$ 2.2 million in 2014

Financial instruments: Grant

Institutional arrangements: Samdhana Institute received funding from Ford Foundation, Climate and Land Use Alliance, NORAD, IUCN (Danida, the Netherlands), Rights and Resources Initiative, Global Greengrants Fund, International Cocoa Organization, UNDP, The David and Lucile Packard Foundation, The Ecology Trust, Margaret A. Cargill Foundation, McKnight Foundation, EarthAction, American Jewish World Services, World Jewish Relief, Christian Aid, and Religious Action Center for Reform Judaism. Samdhana then distributed grants ranging from US\$ 5,000 to US\$ 15,000 to local communities and NGOs.

Project description: From its offices in Indonesia and the Philippines, [the Samdhana Institute](#) serves as an NGO intermediary to facilitate a small grants program for local grassroots environmental, Indigenous Peoples, and women's groups. This initiative helps address a gap in adequate access to climate finance by local actors that are implementing sustainable, gender-responsive adaptation and mitigation strategies for those most vulnerable to climate change. Grantees work on sustainable resource management and build local knowledge and capacity to adequately respond to climate change impacts.

Experienced activists and leaders in local community movements acting as advisors play a crucial role in enabling Samdhana's funding to operate efficiently and effectively, and to reach many communities. They identify and evaluate proposals, and act as bridges between community groups and grant administration staff. Advisors help staff conceptualize, carry out and evaluate initiatives. Advisors also provide direct hands-on training, guidance, and mentoring of community grantees, and wide networking and linking opportunities amongst government agencies, NGOs and institutions, the business sector, and other communities.

Through these advisors, Samdhana is able to stay in frequent touch with grassroots grantees and stay informed of challenges and successes. Through these relationships of trust, Samdhana is able to identify and fund the most critical needs without creating significant competition among and within communities, or incurring high administrative costs. Community leaders and members remain in the driver's seat throughout the implementation of their projects and development plans.

Results: Approximately US\$ 1,200,000 was given in 2014 as grants to communities, with the rest used for mentoring, capacity building, and administration. In Indonesia, a total of 87 small grants were directly disbursed in 2014, amounting to US\$ 1,140,000 (excluding costs for capacity building, mentoring and operations). In the Philippines and Mekong River region, US\$ 203,175 in direct grants have been processed for communities and local organizations. The small grants resulted in increased resilience to climate change and more sustainable land use management practices in key ecosystems, including the following:

- Diversified and improved agricultural production, integrated organic farming for securing community food sources, and improved and sustained means of subsistence for farmers of the Maguinwanhay-Pulanguinyon tribe in the Upper Pulangui River Basin in the Philippines.
- Improved watershed management in the village of Haruku in Maluku, Indonesia.

The grant enabled the establishment of a community-based nursery of endemic tree species for reforestation and improved protection from extreme weather by construction of a storm surge barrier using local knowledge.

- Sustainable land use planning in Haiyan-hit Samar municipalities in the Philippines. A mangrove natural resource assessment was conducted.
- Advocacy for policy reform of resource utilization and participatory land-use planning through support of several community organizations and local NGOs in Indonesia.
- Addressing land tenure security and processing of ancestral domain claims for Indigenous Peoples across Indonesia and the Philippines.
- Samdhana grantees have successfully leveraged private and government assistance to contribute to their initiatives supported by the small grants -- through trainings and skill-building, provision of technical resources and experts, and additional capital investment.

Success of the project can be attributed to the following:

- The projects all stem from community-driven climate action, rather than simply community-based action that calls only for participation. Communities initiate, develop, and implement and monitor the projects themselves. The projects are thus responsive to local needs and more effective in building resilience.
- Gender-responsive, transparent multi-stakeholder decision-making is the goal at every stage in each project. This ensures inclusiveness.
- Respected experts on climate change and community involvement act in each grant as advisers to support the communities, follow progress, and act as intermediaries to report challenges and successes back to the grant institution. This makes the grants system cost-effective.

For more information, please contact Antoinette G Royo, Samdhana, nonette@samdhana.org.



Pictures from the Community-based Adaptation project in Haruku, Maluku, Indonesia. Above left: coastal erosion. Above right: Building a storm surge barrier. Below left: The community education centre. Below right: Mangrove tree nursery for reforestation.

IDCOL Solar Home System Program

Location: Bangladesh

Project type: Energy access through distributed renewables

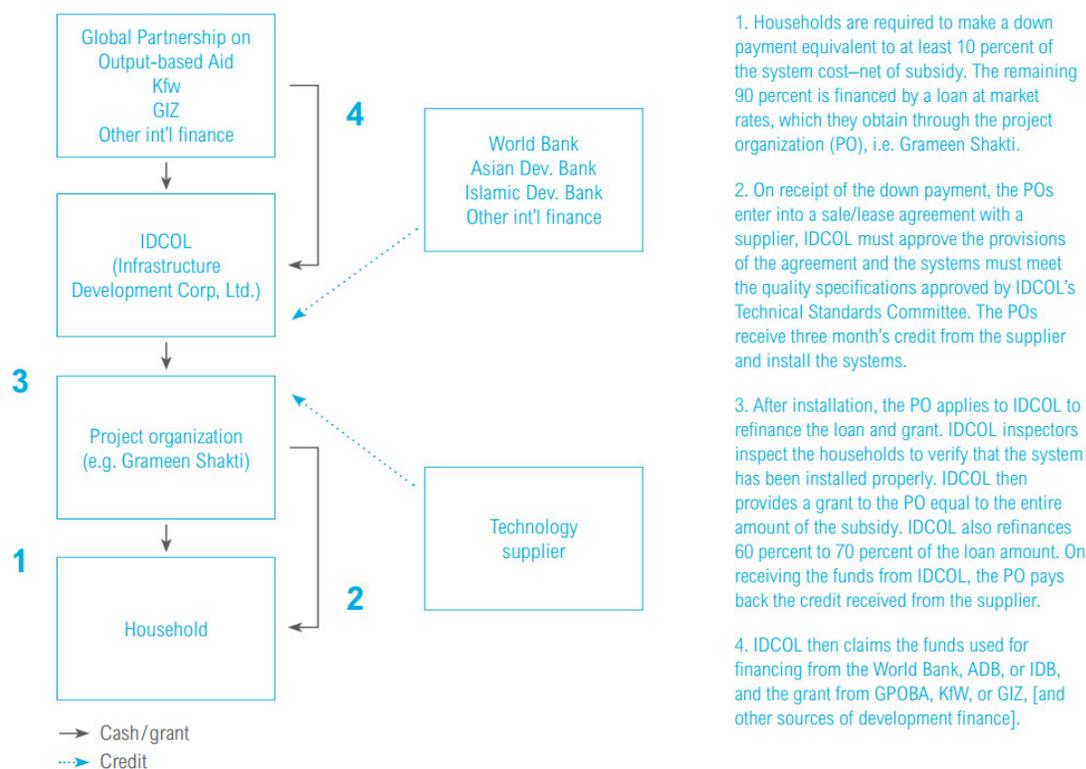
Financing amount: US\$622 million as of late December 2014; US\$540 million in concessional loans, US\$82 million in grants

Financial instruments: Grants (mostly output-based aid) and concessional loans

Institutional arrangements: Concessional loans⁸ provided by ADB (US\$88 million), IDA (US\$346.5 million), ISDB (US\$16.7 million), and JICA (US\$88.4 million). Grants provided by DfID (US\$23.8 million), GEF (US\$7 million), GTZ (now GIZ) and DGIS (US\$14.6 million), Global Partnership for Output-Based Aid (US\$14 million), KfW (€19 million), and USAID (US\$3.4 million).

IDCOL (Infrastructure Development Company, Ltd.), an institution in Bangladesh which provides loans to private sector companies to support infrastructure development, is owned by the Bangladesh Ministry of Finance and governed by an independent board of directors. Funds were channeled through IDCOL (see graphic below) where they were used to reduce costs for end users and distributors of solar home systems, providing liquidity for rapid expansion of solar home system deployment in Bangladesh. At present, IDCOL is working with 47 partner organizations (POs), including NGOs, microfinance providers, and social enterprises.

IDCOL BANGLADESH SOLAR HOME SYSTEM FINANCING MODEL



Source: Kumar, Z. and Sadeque, S. (2012). Output-Based Aid in Bangladesh: Solar Home Systems for Rural Households. GPOBA

⁸ Source: https://www.climateinvestmentfunds.org/cif/sites/climateinvestmentfunds.org/files/Bangladesh_EOI.pdf

Project description: The IDCOL Solar Home System Program began in 2003, with initial support from the GEF and World Bank. The program aimed to catalyze 50,000 solar home system installations by 2008, helping to make these systems affordable to end-users through a novel approach to implementation.

Results: The program has been massively successful, with 3.45 million solar home systems installed by the end of 2014, benefitting 15.5 million people – about 9 percent of the population of Bangladesh. It is estimated that the program has created 75,000 jobs, reduced emissions from the burning of kerosene and other fuels, and reduced emissions of black carbon that contribute substantially to anthropogenic climate forcing. First-time access to electricity for millions has thus been achieved through clean and reliable means, helping Bangladesh to become a global leader in distributed solar energy and setting the country on a different energy path from the status quo.

Financially, the program’s success was driven by a number of key factors, including:

- Access to a large (and growing) pool of credit enabled the IDCOL solar home system to expand rapidly. Partner organizations that were distributing solar home systems would make loans to end users, which would then be refinanced by IDCOL and its contributors. This meant that partner organizations could expand much more quickly than might have been possible without access to a large pool of debt to help them scale up deployment.
- While the program initially provided both capital and interest rate subsidies to make the solar home systems more affordable (and financing more accessible) to end users, the subsidy component has been phased out over time as learning reduced the cost of deployment and technology costs fell. This approach helped to ensure a more sustainable market over time, with reflows to IDCOL being reinvested to catalyze additional deployment, allowing the IDCOL solar home program to reach scale rapidly. A results-based payment model also contributed.
- Technical and capacity-building by many partner organizations – even before the expansion of the IDCOL Solar Home System Program – helped lay the groundwork for the program’s rapid growth. Engaging a broad network of capable NGOs, microfinance partners, and other entities with deep local networks, and helping to build their capacity, were key determinants of the program’s success.



Photo credit: Solar for Bangladesh

For more information, please contact Alex Doukas, World Resources Institute, Alex.Doukas@wri.org, or Giulia Christianson, gchristianson@wri.org.

China Utility-Based Energy Efficiency (CHUEE) Finance Program, Phase I and II

Location: China

Project type: Energy efficiency finance

Financing amount: US\$1.2 billion

- US\$207 million (2006-09) in loan guarantees through a risk-sharing facility from the IFC, catalyzing US\$936 million in project investment
- US\$16.5 million in grants by the GEF, US\$3 million in grants from the Government of Norway, and US\$3 million in grants from the Government of Finland, as a first loss cushion for IFC's risk-sharing facility and to provide support for technical assistance and capacity-building

Financial instruments: Grants, partial loan guarantees (primary), and technical assistance (secondary)

Institutional arrangements: A risk-sharing facility and technical assistance grants were accessed by major Chinese commercial banks (notably Industrial Bank, Bank of Beijing, and Shanghai Pudong Development Bank), enabling these banks to lend to energy end-users and small and medium enterprises. Grants also enabled IFC to provide technical assistance to energy efficiency equipment and service suppliers, energy management companies, government agencies involved in energy efficiency.

Project description: The program targeted three types of players in the Chinese energy market: commercial banks, energy services companies (ESCOs) and end users of energy. While the first two categories were directly supported by the program, this support was geared toward providing indirect benefits to energy end users as well.

Chinese commercial banks were supported by partial IFC loan guarantees to mitigate the risk (as well as the perception of risk) associated with energy efficiency project lending. They were also provided with advisory services in the form of information and education about unfamiliar technologies and finance models, as well as independent consultant reviews of specific projects, in order to build capacity and experience within the banks on energy efficiency lending.⁹

At least 135 energy services companies became part of the IFC's Energy Management Company (EMC) network. They were provided with advisory services similar to the commercial banks. In addition, membership in the network enhanced interaction with lenders and statistically raised the likelihood of receiving finance through the program.

Results:¹⁰ CHUEE was established in 2006, with a second phase commencing in 2008. By the end of 2012, CHUEE had helped catalyze US\$1.8 billion in investment in energy efficiency and renewable energy projects,¹¹ reducing greenhouse gas emissions by 19.3 million tons CO₂e a year, exceeding initial targets.¹²

At the bank level, one of the two major partners¹³ grew at twice the rate of comparable

⁹ More details on the financial arrangement and program performance available at a glance on slide 13 of the following presentation: http://www.oecd.org/env/cc/Part%202%20Miller_CCXG%20Global%20Forum%20-%20OECD%20260912%20-%20FINAL.pdf

¹⁰ Based on World Bank Independent Evaluation Group Report, pp. ix-xi.

¹¹ http://lowemissionsasia.org/sites/default/files/pdf_file/CHUEE%20for%20ADB%20William%20Beloe.pdf

¹² <http://ifcext.ifc.org/ifcext/pressroom/IFCPressRoom.nsf/0/02AD7593685AD43385257B5500116D09>

¹³ Industrial Bank, which was responsible for about 98% of loans issued under the programme as of June 2009.

competitors. More significantly, it established a dedicated department for energy efficiency lending, a unique feature among Chinese banks, and committed 10 billion yuan of its own funds to energy efficiency lending outside of the program. It has also implemented guidelines and procedures for energy efficiency loans, and built the capacity to apply project finance tools to energy efficiency finance.

Further, and crucially, the first loss contribution of the GEF helped the IFC enter into an area – risk-sharing facilities for energy efficiency lending – that it had previously not focused on as a core line of business. The GEF’s first loss contribution helped to shift some of the activities of a major international financial institution toward greener investment.

While the CHUEE example is an important one, it also had flaws that can provide lessons to the Green Climate Fund. The beneficiaries of the program’s finance were mainly large industrial companies, particularly in the cement sector. This was contrary to the initial expectation that small and medium enterprises would stand to benefit most. Related to this issue, the additionality of the CHUEE finance may have been less than expected, since many larger companies may have invested in energy efficiency even without the CHUEE support – albeit later than they would have in the absence of the CHUEE program. The IFC has sought to address these issues in subsequent phases of the program, from which the GCF could learn.

Lessons learned:

Right partners: The program originally involved the IFC working directly with energy utilities to find financing. This failed because of a strategic mismatch – utilities are not naturally incentivized to seek energy efficiency.¹⁴

The policy context: The Chinese government in its 11th 5 year plan stipulated that the country’s energy consumption per unit GDP be reduced by 20 percent during the planned five-year period, or about 4.4 percent annually. Without such a push for efficiency, the Chinese market would have been a difficult one in which to stimulate energy efficiency lending.¹⁵ Government support was also crucial to allowing the IFC to create specific lending structures, which were essential to the success of the project but not fully in line with national regulations.

Capacity building combined with loan guarantees: International experience has demonstrated that loan guarantees alone are often not enough to catalyze investment in markets that are unfamiliar to lenders. Technical assistance and capacity building were central to the success of CHUEE. In the short term, the CHUEE technical assistance contributed to the high success rates of the projects chosen and even advanced the careers of the bank professionals within their organizations. In the medium term, it has greatly increased the demand by other banks to be included in the program, helping to greatly scale up the program’s impacts. In the longer term, this capacity building has indirectly catalyzed nearly US\$1.8 billion of energy efficiency finance, where CHUEE partners have started significant lending without the program’s direct assistance.¹⁶

For more information, please contact Alex Doukas, World Resources Institute, Alex.Doukas@wri.org, or Giulia Christianson, gchristianson@wri.org.

¹⁴ WB IEG Report, Box 2.2., page 14.

¹⁵ IIP Case Study, accessed at <http://www.iipnetwork.org/IIP-FinanceCaseStudy-A-CHUEE.pdf>.

¹⁶ UNFCCC, “IFC China Utility-based Energy Efficiency (CHUEE) Program”. Accessed at http://unfccc.int/secretariat/momentum_for_change/items/8373.php

Dharnai Solar PV Mini-Grid Pilot Project



Photo: Children sit under solar panels in Dharnai. A solar-powered mini-grid is now supplying electricity to the village. © Vivek M. / Greenpeace

Location: Dharnai village, Bihar State, India

Project type: Community-based renewable energy access

Financing amount: €367,800 (US\$497,700), includes operations & maintenance (O&M) for the first year

Financial instruments: Grant by Greenpeace India, financed 100% by private donations from Indian citizens

Institutional arrangement: Greenpeace India implemented the project in partnership with [BASIX](#), an Indian livelihood promotion institution and the Indian Centre for Environment and Energy Development ([CEED](#)), the Greenpeace local representative.

Project description: In July 2014, Greenpeace India and its partners launched a solar photovoltaic mini-grid that has brought 230V AC electricity access to 2,500 people in the village of Dharnai. The objective of this initiative was to develop and demonstrate a sustainable O&M model that involves a high level of community participation in all phases of project planning and execution, and a third-party operator - in this case BASIX - to manage all O&M systems and fee collection-related functions. A construction company was selected by a competitive bidding process based on experience, pricing and timeline.

Results: Dharnai has been transformed since an affordable solar energy grid arrived. The installation took three months and put in place 70 KW of solar power distributed across the village in four clusters (280 solar panels, 224 batteries, 15 inverters), 30 KW of solar-based agricultural irrigation pumping systems, and 60 solar street lights. The mini-grid provides electricity services to 450 households, 50 commercial establishments, two schools, a health center and four government institutions. A battery backup ensures power is available around

the clock. It is envisioned that the Village Energy Committee will take over full ownership of the system.

This mini-grid project has the potential to reduce 189t CO₂e per year by replacing kerosene and other petroleum fuel-based lighting with solar-powered LED lighting - a savings of 92 tons of coal each year. If the mini-grid design was replicated in the 20,000 villages in Bihar that still lack electrification, the state would avoid burning up to 1.75 million tons of coal annually. In addition, the three solar-powered irrigation pumping stations have reduced the use of diesel by close to 1,000 liters per farmer per year.

Solar-powered lighting means children can now finish their homework after sunset. Women feel safer venturing out after dark and families save money previously spent on fuel for generators and kerosene lamps. The arrival of solar-powered water pumps has improved irrigation, increasing farmers' crop yields. With solar energy, villagers have been able to recharge their mobile phones regularly and more cheaply, thus enabling vital communication and access by residents of Dharnai to the internet. Entrepreneurs are setting up small businesses powered by the sun. Prolonged business hours of small-scale traders now attract more customers. Snack shops, repair services, communication and computer shops, and sewing stalls, among other businesses, have taken advantage of the new energy opportunities to diversify and extend their services.

Renewable energy systems have high capital expenditures that need to be covered upfront. International finance institutions like the Green Climate Fund could play a useful role in scaling-up impact from projects like the Dharnai solar mini-grid by financing national intermediaries that bundle the investment, operating and maintenance costs.

For more information about this project, please contact Ansgar Kiene, Greenpeace, ansgar.kiene@greenpeace.org.

Expanding Pay-As-You-Go Household Solar Systems



Photo credit: Ashok Kitta, Product Manager, Simpa Networks.

Location: Uttar Pradesh, India

Program type: Community-based renewable energy access

Financing amount: US\$14 million

Financial instruments: Equity, debt, and grants

Institutional arrangements: Simpa Networks, Inc. (Simpa Energy India Pvt Ltd.) is the project implementer, leasing solar home systems to the rural energy-poor in India using pay-as-you-go technology. USAID, Hilti Foundation, DOEN Foundation, IFC, and Renewable Energy and Energy Efficiency Partnership (REEEP) provided grant support. The US Overseas Private Investment Corporation (OPIC) and GDF Suez provided loans. Khosla Impact, GDF Suez, Hilti Foundation, DOEN Foundation, Sorenson Foundation, and Schneider Electric provided convertible debt. In addition, Arc Finance, Invested Development, Hilti Foundation, Asian Development Bank, DOEN Foundation, Village Capital, and Sorenson Foundation made equity investments.

Project description: Simpa Networks sells solar-as-a-service to households and micro-enterprises in rural India using a business model similar to the solar leasing models that are transforming residential solar markets in the United States, but adapted for the rural Indian market. The home system typically contains two to three lights, a fan and two mobile charge points. Customers make a small down payment to Simpa to have the system installed, and pay per day to use the system. Customers receive full and free maintenance for the solar home system, including service visits by technicians and customer care support as long as the customer is leasing from the company. The patented prepaid metering technology provides revenue assurance for the company, and for the investors that help underwrite the up-front capital costs of the distributed solar assets.

Simpa's sales model is designed to access the energy-poor through trusted channels. They recruit and train local talent to become village-level entrepreneurs, who market Simpa in their rural communities and collect payments from customers. There are over 440 village-level

entrepreneurs in the 8 districts where the company operates. They are paid a commission on each sale, and supported by Simpa's permanent sales force team.

Simpa is continually innovating by interviewing customers, relaying their feedback to hardware and software teams, and then targeting new products to particular customer segments. On the pricing innovation side, one of Simpa's key achievements has been the "Flexi" Plan, which gives customers the option of buying back the solar system from Simpa after six months, transforming customers into owners of their own energy production.

Results: To date, the project has reached more than 10,100 households and over 1,100 micro-enterprises in rural India, providing over 56,000 people with access to clean energy. Over 1.6 million clean energy days have been sold, 171 tons of CO2 emissions saved, and 135 MWh of clean energy generated. Livelihoods have been provided for 289 full-time employees and over 1,700 contract agents in rural India.

*For more information about this project, please contact Priya Shah, Simpa Networks,
priya.shah@simpanetworks.com.*

Cooperative Solid Waste Collection and Handling (SWaCH)

Location: Pune, India

Project type: Community-based mitigation, waste sector

Financing amount: US\$1.2million-1.5 million

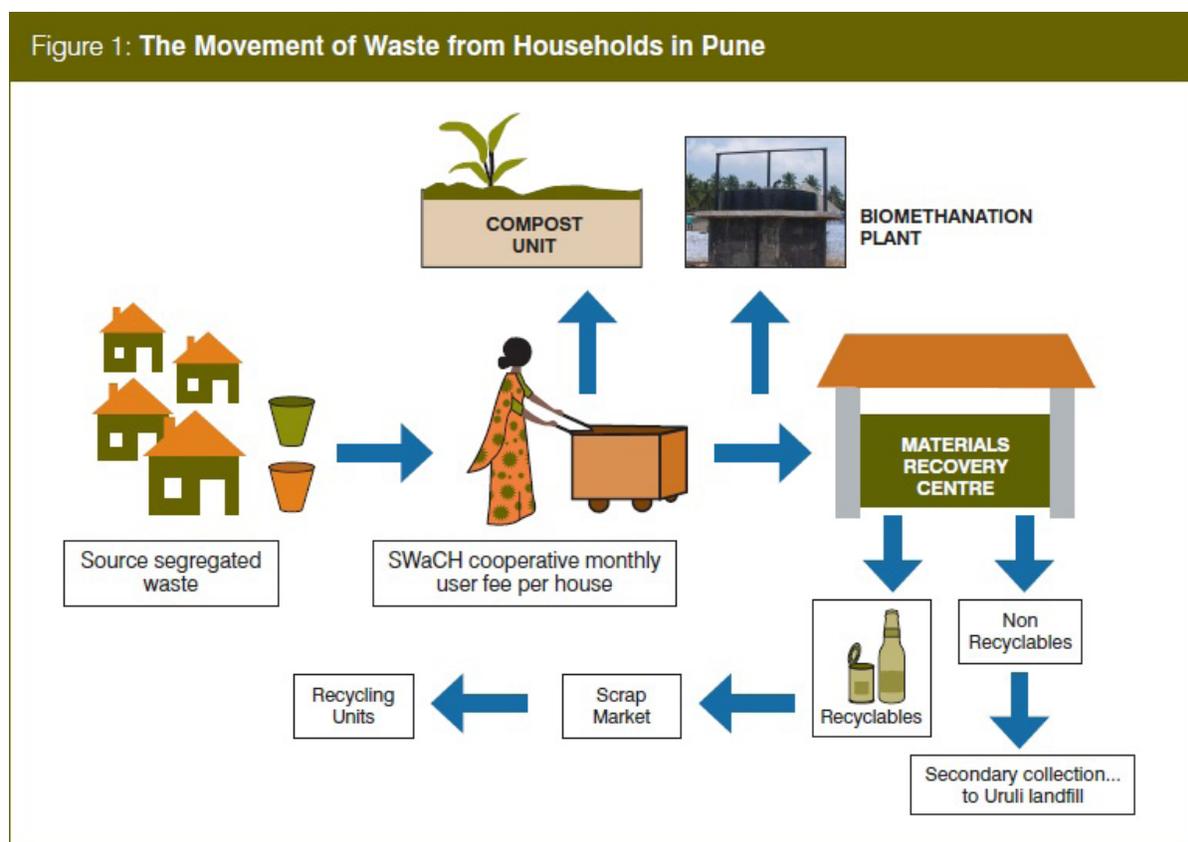
Financial instruments: Grant

Institutional arrangements: Women in Informal Employment: Globalizing and Organizing (WIEGO) provided grants to the Pune Municipal Corporation, which in turn granted funds to SWaCH for administrative, equipment and other operational costs.

Project description: The cooperative Solid Waste Collection and Handling (SWaCH means 'clean' in Marathi) is an autonomous social enterprise that provides front-end waste management services to the city of Pune, with support from the Pune Municipal Corporation (PMC). This pro-poor public private partnership recognizes that all residents, rich and poor, have rights to the city that they live in and obligations to care for it.

SWaCH members, 80 percent of whom are women from marginalized castes, provide door-to-door waste collection services for more than 400,000 households, which constitute 47 percent of the city, institutional campuses (schools, corporate offices, banks, public housing, etc.) and residential neighborhoods on a per-household contract/user-fee basis.

Source: Integrating Waste Pickers into Municipal Solid Waste Management in Pune, India, WIEGO Policy Brief (Urban Policies) No 8, Poornima Chikarmane, July 2012



Source: Integrating Waste Pickers into Municipal Solid Waste Management in Pune, India, WIEGO Policy Brief (Urban Policies) No 8, Poornima Chikarmane, July 2012

SWaCH is an initiative of Kagad Kach Patra Kashtakari Panchayatorganised (KKPKP), a trade union that has organized more than 10,000 waste pickers, asserting their contribution to the environment, their status as workers and their crucial role in the solid waste management (SWM)

of the city. KKPKP was able to integrate waste pickers into the city's formal SWM thanks to the existence of a credible organization of informal waste workers, legal and policy frameworks, the receptive inclination of the municipal administration, support of elected representatives, and the presence of a strong, formal municipal employees union opposed to waste sector privatization.

SWaCH's model includes: direct collection of source-segregated waste from domestic and small commercial generators; maintenance of separate waste streams; integration of existing waste pickers and informal waste collectors for materials recovery and processing; diversion of organic waste from landfills into decentralized composting, bio-methanation and non-incineration technologies; diversion of recyclables into recycling with the benefit of strengthening the informal waste sector; and opportunities for up-skilling and upgrading work for workers.

Results: SWaCH's 2,300 worker-members earn on average up to three times the income they earned before joining the cooperative. In addition, SWaCH provides health insurance and some educational benefits, such as school books for worker-members' children, which has helped build resilience and integrate one of the most marginalized and vulnerable populations in India. In turn, residents have benefited from improved waste management services at lower costs.

The program saves the city an estimated US\$2.8 million per year in municipal waste collection and disposal costs. Better treatment of organic matter has reduced emissions of methane, a potent greenhouse gas, and diverts enough waste to avoid 640,000 tons of greenhouse gas emissions annually. Higher recycling rates have saved energy, reduced climate impacts, and minimized pressure on natural resources such as timber and paper pulp from forests. In the years to come, the program will continue to bring down landfill and incineration rates and generate a clean stream of organic materials for composting and biogas.

*For more information, please contact Lakshmi Narayan, SWaCH,
wastematterspune1@gmail.com.*

Community-Based Green Energy

Location: 8 districts in the most vulnerable arid and semi-arid regions of the Eastern and Rift Valley Provinces of Kenya

Project type: Community-based renewable energy access

Financing amount: Total project cost €2.32 million; EU is financing €1.74 million (75%) and CAFOD €0.58 million (25%)

Financial instruments: Grant

Institutional arrangements: CAFOD, a UK-based NGO, the Kenyan Diocese of Kitui, Diocese of Isiolo, Dupoto-E-Maa, and Solar Works East Africa, Ltd., a private company, were project implementers. The Kenyan Ministry of Energy, Ministry of Agriculture, Livestock and Fisheries through agricultural extension services, Ministry of Environment, Water and Natural Resources, Ministry of Education, Ministry of Sports, Culture and Arts, and county and provincial administrations were consulted on project design and implementation.

Project description: The objective of this four-year, community-based project is to address the lack of access to sustainable, affordable, reliable and safe energy services. Community members identified such services as essential for household, community and productive uses, including for income-generating activities, and generally for poverty alleviation. The project involved the procurement and installation of solar photovoltaic systems (solar-powered stoves, water pumps, water heating, refrigeration, lighting, water purification and greenhouses) to provide energy services to the targeted rural communities, as well as a range of skills and capacity building.

Results: The project has so far reached 292,139 people, through the provision of energy - mainly through community and productive services. This includes: installing solar lighting systems in 90 schools and 48 health centers, solar refrigeration systems in 48 health centers, solar water purification systems in 22 health centers, 180 energy-saving jikos (cook stoves) in 91 schools, and providing solar water pumping systems in 56 greenhouses for women's groups and in seven solar-powered information and communication technology (ICT) centers for youth groups. Through the greenhouses project and youth-run ICT centers (which provide mobile phone charging, computer and internet services, mobile money transfer and hair cutting services), community members have been able to generate additional income. Solar Works provided technical support and skills development, including training on operating and maintaining the various systems installed.



Left: Sinteyo and the women's group with solar panels at the greenhouse in Isiolo, Kenya. Right: Nurse Monica Asikuku of Emeret Health facility getting purified water for a water purifier installed by the project at the facility in Isiolo, Kenya. Annie Bungeroth, CAFOD, 2014.

In addition, communities were given training in business management, market analysis, farmers' rights (e.g. to receive support from agricultural extension officers) and agronomic practices. This has led to increased local capacity, greater food security and increased incomes and assured long-term sustainable livelihoods. In addition, women have acquired new knowledge and skills in agricultural production and gained the confidence to negotiate for better prices for their produce and ask for better services from the local government.

The success of this project hinged on:

- Taking into account local governance modalities and ensuring buy-in from local governing bodies and regulatory authorities prior to implementation;
- Tailoring technical energy solutions to meet end-users' energy needs, in the context of their wider development needs, and ensuring they are appropriate to their local context; and
- Supporting communities with a range of capacity and skills building and training, so as to build the wider "ecosystem" required to ensure energy services result in wider development impacts.

Overall, using a multi-stakeholder and integrated approach has resulted in more sustainable, affordable, safe and reliable energy service provision, improved environmental protection, human health and safety, improved communications in rural areas and overall poverty reduction in target areas. Individuals and communities have also reported improved well-being and happiness from the project.

*For more information about this project, please contact Sarah Wykes, CAFOD,
swykes@cafod.org.uk.*

Sustainability and Income Generation in Slums through Worm Composting

Location: Oaxaca, Mexico

Project type: Mitigation, waste sector, composting and recycling

Financing amount: €298,000 in 2 tranches: €115,000 invested by SiKanda for 2 Worm Composting Centers in 2010-2015; and €183,000 to build 3 additional Worm Composting Centers in 2015-2018

Financial instruments: Grant

Institutional arrangements: Solidaridad Internacional Kanda (SiKanda), a registered Mexican NGO, has implemented the Worm Power project thanks to grants and donations from foundations, private donors and organizations in the US, Canada, Mexico, Italy, UK, France, Spain and Netherlands. In-kind donations and workforce hours were also provided by project beneficiaries and local authorities, including organizations of informal recyclers, who produce a large portion of the fertilizer, and local organic markets, which allow SiKanda to sell the organic fertilizer and promote the project. Authorities in the municipality of Huajuapán de León, located in Oaxaca state in southern Mexico, provided the space to implement the Worm Power project. The Technological University of the Mixteca region of Oaxaca and its students provided technical assistance in administration, management of cooperatives and marketing.

Project description: Between 2010 and 2015, the Worm Power project, implemented by SiKanda, set up two worm composting and recycling centers in suburban areas of Oaxaca City that process over 500 tons of organic waste each month, converting it into rich, organic fertilizer. SiKanda sells the organic fertilizer, increasingly in demand because of rising prices for chemical fertilizers, to local organic markets, gardeners, organic farmers and the general public. Sixty-five percent of sales go to the workers who produce the fertilizer and the rest is used for packaging, transportation, and management costs. In addition, Worm Power provides families with worm composting kits and training to transform their household organic waste into compost for their own use.

The project improves waste management at the household and institutional levels. It reduces the amount of waste sent to landfills or inadequately disposed of at the family and community levels, preventing waste from reaching open-air, uncontrolled dumps that pollute air, water and soil. In addition, by incorporating vermicomposting into municipal waste management, the project helps avoid climate-polluting methane emissions by reducing the amount of organic waste that reaches the landfill. Worm compost also displaces the use of petroleum-based fertilizers, and helps raise the level of carbon that soils are able to sequester.¹⁸

Results: The Worm Power project has been scaled up successfully over five years, expanding the number of informal recyclers (pepenadores) who directly benefit from the project from 340 to 5,500 people. The two facilities, built in 2011 and 2014,

¹⁸ UNEP Annual Report (2010), <http://www.unep.org/annualreport/2011/>

have also become training centers for the families of pepenadores, students, local authorities and community members on topics including climate change, recycling, compost production and family agriculture.

The volume of organic waste transformed into compost each month increased from 50 to over 500 tons, 75 percent of which is processed collectively at the Worm Power Centers, the rest by household vermicomposting. The municipality credits the Worm Power project with improving the effectiveness of waste management by over 30 percent in marginalized communities, and increasing incomes for informal recyclers by 60 percent, thanks to the collaborations among government, civil society, recyclers and academia. The project cuts annual greenhouse gas emissions by 541 tCO₂e - equivalent to the annual greenhouse gas emissions of 114 passenger vehicles, consuming 1,258 barrels of oil, or burning 581,095 pounds of coal.¹⁹

For more information about this project, please contact Jose Carlos Leon Vargas, Director of Solidaridad Internacional Kanda, direccion@si-kanda.org or visit www.si-kanda.org.

¹⁹ <http://www.epa.gov/cleanenergy/energy-resources/calculator.html#results>

National Rural and Renewable Energy Programme

Location: Nepal

Project type: Small-scale renewable energy access, policy support

Financing amount: US\$108 million

Financial instruments: Grants

Institutional arrangements: The Alternative Energy Promotion Centre (AEPC), a public institution within the Nepali Ministry of Science, Technology and Environment, facilitated US\$53.8 million from Government of Denmark, Government of Norway, UK Aid, KfW, GIZ, SNV, World Bank, ADB, UNCDF, UNDP, EU, USAID, and the National Rural and Renewable Energy Programme. Communities arranged an additional US\$54.2 million in in-kind contributions.

Project description:²⁰ The suite of policies put in place by AEPC between 1992 and 2014 to support mainstreaming small-scale renewable energy in Nepal includes the Hydropower Policy Act (1992), Rural Energy Policy (2006) and the Renewable Energy Subsidy Policy (2013). Their aim was to take advantage of Nepal's abundant hydropower potential to wean the country off of commercial fossil fuels (mainly oil and coal) imported from India and international markets, and bring electricity to the third of the population still lacking access. Organizational development, capital mobilization, technology promotion, environmental management, and skill enhancement - especially for women and Indigenous Peoples - are key elements of these policies.

The Hydropower Policy Act allows hydropower plants below 1MW to skip licensing requirements, while requiring those bigger than 1MW to register with the District Water Resource Committee and the Department of Electricity Development at the Ministry of Energy. The legislation creates a fund where royalties from hydro projects can be used to finance renewable energy micro-hydro projects. The Act also has provisions for connecting micro-hydro to the grid, the purchase of existing micro-hydro assets by utilities or developers, and support for the generation and use of electricity by district development committees and municipalities.

The objective of the Rural Energy Policy is to reduce dependency on traditional energy sources and protect the environment by increasing access to clean and cost-effective energy in rural areas. The policy seeks to increase employment and productivity by developing rural energy resources, and raise the living standards in rural communities by integrating rural energy with social and economic activities. In particular, the Rural Energy Policy also promotes the integration of off-grid and small rural energy systems with mini-grids, and in turn with the national grid. As its name implies, the Renewable Energy Subsidy Policy provides subsidies to pico-, micro- and mini-hydro power projects.

Results: The suite of hydropower and renewable energy policies facilitated by AEPC has resulted in the installation of 2,600 community-based pico- and micro-hydro systems throughout the country, with 36MW of installed capacity. This has electrified 350,000 households and provided 1.5 million people with clean lighting solutions.

For more information, please contact Dipti Vaghela, Hydro Empowerment Project, diptimv@gmail.com

²⁰ Based on Nepal Country Context factsheet developed by Hydro Empowerment Network, available at <https://drive.google.com/file/d/OB0ovRM2jSz9wdENNS2pDX1cxZzg/view>

Zero Waste Program at Bir Hospital



Photo credit: Pratibha Sharma, Global Alliance for Incinerator Alternatives, India.

Location: Nepal

Project type: Mitigation, waste sector, zero waste

Financing amount: US\$ 0

Financial instruments: In-kind donations

Institutional arrangements: Bir Hospital, managed by the Nepali National Medical Institute, implemented the zero waste project with the National Academy of Medical Sciences.

The hospital received no funding from outside organizations, and maximized cost reduction methods to make the waste management system financially viable. The hospital purchased equipment (like buckets and autoclaves) itself, converted its mortuary into a waste management building, and redesigned patient transfer trollies into waste transport trollies. Technical support was provided by Health Care Without Harm and the Health Care Foundation, Nepal. The project was endorsed by the World Health Organization.

Project description: Established in 1889, Bir Hospital is one of Nepal's oldest and busiest government hospitals, operating with a scarcity of resources, beds and trained staff to service the needs of the masses of Nepali citizens seeking care, cure and surgery. For years, a heap of trash and medical waste dominated a large section of the hospital's backyard, where informal sector workers and children without protective clothing would scavenge for used syringes and other plastic scraps to resell on the black market. Prior to the introduction of the alternative healthcare waste management (HWM) method, the hospital generated an average 332.97 kg/day of medical waste. The volume of waste could be over 500 kg/day at full bed occupancy.

To address the solid waste problems, a system based on zero waste concepts was designed to segregate all types of waste at the source and treat, reuse or recycle them so that the waste disposed into Kathmandu's municipal waste stream would be negligible. Before the implementation of zero waste HWM, medical waste was mixed with general waste without treatment or segregation. Empty saline bottles, cans of soft drinks, old buckets, trollies, medicine bottles, papers, plastic, and used syringes were highly visible on the Bir Hospital

premises. Medical waste - including syringes, plastic, bandages, and even human body parts - was thrown into municipal garbage dumps.

By integrating a zero waste program with “mercury-free” and “safe-injection” programs in 2010, the [Health Care Foundation](#), in collaboration with international allies like [Health Care Without Harm](#) and the World Health Organization, transformed the hospital into a state-of-the-art model for dealing with hazardous and non-hazardous medical waste. The hospital supports local enterprises by using innovative, locally-made equipment that ensures all discards are safely stored, sterilized, recycled, and composted.

Some highlights of this project include:

- Successful replacement of waste incineration with environmentally-friendly autoclaves. By tailoring the sterilization equipment to meet the characteristics of medical waste such as cotton bandages and dressings, Bir Hospital reduced dioxin emissions associated with medical waste incineration by over 90 percent.
- Vermicomposting breaks down bandages, dressing, and other biodegradable hazardous waste into compost (after autoclaving).
- Replacement of mercury-filled medical devices such as thermometers and sphygmomanometers (blood pressure devices) with safer non-mercury alternatives.
- A biodigester was installed for treating organic (mostly food) waste, which generates an average 10m³ of biogas per day, a source of renewable energy.

Results: Today, more than 50 percent of the hospital’s total waste stream is recycled - sustaining hundreds of green jobs. According to Mahesh Nakarmi, Program Director of the Health Care Foundation’s Health Care Waste Management Program, this ambitious zero waste project was started with “zero budget.” The GCF could finance a regional program to establish regulations for zero waste HWM at a large number hospitals, and provide the financial support to implement such policies and ensure their financial sustainability over the long-term.

For more information, please contact Mahesh Nakarmi, mahesh.nakarmi@gmail.com, or watch this video: <https://noharm-global.org/articles/news/global/video-bir-hospital-transforms-its-healthcare-waste-management>.

Energy Services Delivery and Renewable Energy for Rural Economic Development Projects

Location: Sri Lanka

Project type: Community-based renewable energy access, policy support

Financing amount: US\$295 million

Financial instruments: Grants, credit, debt, equity

Institutional arrangements:

Total cost of the Energy Services Delivery Project was US\$ 45 million between 1997 and 2002, with financing provided by the World Bank (US\$22 million credit), GEF (US\$6 million grant) and US\$17 million in local equity and debt.



Photo credit: REDCO

Total cost of the Renewable Energy for Rural Economic Development Project was US\$250 million between 2002 and 2011, with financing provided by World Bank (US\$ 121 million credit), GEF (US\$ 8 million grant) and US\$125 million in local equity and debt.

The program was housed at the Development Finance Corporation of Ceylon (DFCC), which appointed an Administrative Unit to execute the projects. International financing was routed through the DFCC bank to local banks. Eleven participating credit institutions provided additional local debt and equity for both projects. The Ceylon Electricity Board was engaged from the beginning of the projects, making it relatively easy (as compared to other countries) to develop small power producer regulations later in the process. Business development organizations, universities, local provincial councils, the Federation of Electricity Consumers Societies, the Energy Forum and local, national and international NGOs were also involved. Nearly all major government ministries were involved in project-specific approvals.

Project description:²¹ The objectives of the Sri Lanka Energy Services Delivery Project (ESDP) and the follow-on Renewable Energy for Rural Economic Development Project (REREDP) were to support the country's priorities to improve the quality of life in remote, rural communities by utilizing off-grid renewable energy technologies to provide electricity, and to promote private sector power generation from renewable energy sources for the main grid. Secondary objectives included the mitigation of greenhouse gas emissions by removing barriers and reducing implementation costs for renewable energy and improving energy efficiency.

ESDP used a demand driven multi-stakeholder approach to introduce non-conventional renewable energy into the market in Sri Lanka. Long-term and output-based financing, as well as risk mitigation and risk sharing mechanisms, enabled the project to attract commercial financing. The project helped establish social and environmental safeguards, as well as policies to standardize small power purchase agreements and tariffs. ESDP also provided technical assistance to address technical, market, legal and regulatory barriers to on- and off-grid small scale renewable energy generators.

²¹ Based on Sri Lanka Country Context factsheet developed by Hydro Empowerment Network, available at <https://drive.google.com/file/d/0B0ovRM2jSz9wS29WNFk1cndfT00/view>

REREDP built on the success of ESDP to scale up non-conventional renewable energy adaptation. It put in place renewable energy technology-based feed-in tariffs to attract a broader array of technologies. The project also put into place net metering policies to promote distributed power generation. Sri Lanka is continuing to develop non-conventional renewable energy through the Sustainable Energy Authority, created in 2007, even after closure of the project.

Results: ESDP and REREDP were successful in establishing a framework for private sector-led non-conventional renewable energy development in Sri Lanka that recognized that the private sector is not willing to invest in projects where the grid will eventually come unless central grid-interconnectivity is possible. This framework improved transparency in the application of policies and feed-in tariffs following the establishment in 2002 of the Public Utilities Commission, a national regulatory agency. Mini-hydro projects paved the way for grid-interconnected projects (via small power purchase agreements), which are now highly demanded by micro- and mini-hydro power developers in the region. This helped create space for other decentralized power generation options through net metering regulations. As a result, banking has been transformed and renewable energy financing is now mainstream business for Sri Lankan lending institutions.

The projects have resulted in 30 micro hydro developers and 14 micro hydro suppliers registering with the Administrative Unit and the Developers' Association. Sri Lankan small hydro developers, manufacturers and financiers are now venturing into Asia and Africa, while local renewable energy consultants take on regional assignments

As a result of this project, 260 off-grid micro hydro systems were co-funded by the World Bank, provincial governments, NGOs, commercial and rural banks and communities, about a third of which now have partial grid access. In addition, 7,952 households have been electrified via community-owned off-grid micro hydro systems, and 196 MW have been generated by private on-grid small hydro systems. 20 MW of wind power have been generated from private on-grid sources.

Also as a result of renewable energy policy supports, 131,600 households were electrified via solar home systems, although most solar home systems have been discontinued following grid access. However, small scale, grid-tied solar power is gaining ground under net metering regulations.

Over the project's lifetime (1996 to 2014), Sri Lanka's national household electrification rate doubled from around 45 percent to 90 percent. Private sector, grid-tied small scale renewable energy makes up about 10 percent of the country's total electricity generation (405MW capacity in mid-2014). Total investment in renewable energy by communities and the private sector and communities now approaches an impressive US\$1 billion.

For more information, please contact Dipti Vaghela, Hydro Empowerment Project, diptimv@gmail.com.

Uruguay Wind Energy Programme

Location: Uruguay

Project type: Renewable energy, policy support

Financing Amount: US\$7 million

Financial products: Grant

Institutional arrangement: The GEF provided a grant of US\$1 million to UNDP as implementing entity, while the Government of Uruguay provided US roughly \$6 million in co-finance. The UNDP regranted to Uruguay's National Energy Directorate, which provided day-to-day management of the project, policy and technical support and capacity building to private sector wind energy developers and power producers.

Project description:²² The main objective of the Uruguay Wind Energy Programme (UWEP) was to remove the market, institutional, financial, technology and social barriers that were inhibiting the development of commercially viable wind energy investments. The bulk of the project budget was dedicated to policy support, divided between outreach and information dissemination, capacity building, regulation reform and implementation of policy initiatives, technical support to the state utility and national regulator and research and development of wind energy potential mapping and technical standards.

With UWEP support, the Government of Uruguay created a national policy on renewable energy that established a reverse auctioning²³ mechanism for large-scale renewable energy development and a feed-in tariff for small-scale producers. Regulatory reform allowed independent power producers to feed into the grid at a standardized price under the auction contracts, with a mandate for the state utility company to buy all wind power produced.

In order to incentivize early development and jump-start the sector to drive down the cost of later deployment, developers received a bonus for projects that came online before 2015. The government established a 300 MW target for installed wind capacity by 2015, later increased to 500 MW, and then again to 1 GW as the sector's development exceeded expectations. The government also set generation targets for 90 percent of electricity to be from renewables by 2015 (with 30 percent from wind alone).

Results: In part as a result of changes catalyzed by UWEP, Uruguay saw US\$1.3 billion in investment across all clean energy sources (primarily wind) in 2013,²⁴ the largest share as a percentage of GDP of any country in the world.²⁵ In this way, a relatively modest upstream investment of just US\$1 million in multilateral climate finance helped catalyze billions of dollars in investment by aligning institutions, policy and regulation.

The country is well on track to achieve its stated targets. In 2014, 84 percent of Uruguay's electricity was sourced from renewables.²⁶ In the first months of 2015, the total installed wind

²² Paraphrased from UNDP FIT Report

²³ In a reverse auction, multiple bidders compete to win a contract. As the auction progresses, sellers reduce their bids to out-compete their competitors. The winner is the company that offers the lowest bid. Reverse auctions are favored as a means of introducing cost savings in public procurement. If the bid price falls very low, this can put a downward pressure on standards, although formally at least the contractor is expected to meet quality specifications laid out in the contract that they are bidding on.

²⁴ BNEF et al., Climatescope 2014.

²⁵ REN21, Renewables 2014.

²⁶ "Uruguay gets \$216m boost for wind power projects"

http://www.climateactionprogramme.org/news/uruguay_gets_216m_boost_for_wind_power_projects

power capacity exceeded 500 MW.²⁷

As a result of UWEP's work with the government and other stakeholders on a national renewable energy policy, significant amendments to the National Electricity Act, grid connection policies, and regulations, the environment now exists for a massive scale-up in wind energy. Increased returns on investment and prices competitive with the broader electricity market have made investments in planned wind parks attractive to the private sector and have positioned wind power to displace imported fossil fuel sources as the main component of Uruguay's electricity generation.

Lessons learned: UWEP is an illustration of how a modest investment in policy and institutional reform, when coupled with political will, can have significant multiplier effects by creating an enabling environment for renewable energy investment. This type of policy de-risking approach is thus capable of catalyzing much greater investment over time than, for example, a standalone one-off investment in a wind power project.

In addition, the focus on achieving a small demonstration project with the close involvement of the regulator and utility was also considered important in the long term results achieved. Firstly, it enabled the utility to gain hands-on experience in the technology involved. The success of the demonstration in turn motivated the successful opening of the market to private players.

Thus, the UWEP case demonstrates the benefits of investing in creating the right policy, regulatory and institutional conditions that will unleash financing for low-emissions development.²⁸

For more information, please contact Alex Doukas, World Resources Institute, Alex.Doukas@wri.org, or Giulia Christianson, gchristianson@wri.org.

²⁷ <http://renewables.seenews.com/news/uruguays-ute-says-wind-plants-offset-drought-impact-477868>

²⁸ Alex Doukas & Joshua Ryor, "Closing the Renewable Energy Investment Gap"