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Climate-Resilient, Sustainable, and Low-Emission Livelihoods

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Introduction

In responding to the threat of climate change, the 2015 Paris Agreement outlines not only targets, but pathways. Article 2, for instance, focuses on the need to foster climate resilience and low greenhouse gas development. Article 7 also emphasizes the value of strengthening resilience as well as enabling the resilience of socio-economic and ecological systems. Article 8 specifies the need to focus on resilience of communities, livelihoods, and ecosystems. The Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report provided the scientific inputs to the Paris Agreement and highlighted various actions, including mitigation; addressing risks, especially vulnerability and exposure; climate resilience; transformation; adaptation-mitigation co-benefits; and governance.

The IPCC's 2018 Special Report "Global Warming of 1.5°C" reminds stakeholders that climate-related risks to multiple sectors, including livelihoods, are projected to increase with global warming of 1.5°C and will further intensify with a global warming increase of 2°C. In certain areas, there will be irreversible loss of the most fragile ecosystems, which will relegate the most disadvantaged and vulnerable populations engaged in agricultural and coastal livelihoods to crisis upon crisis¹. The report underscores that recent trends in global emissions and actual commitments shown through Nationally Determined Contributions of countries within the Paris Agreement fall short of what is needed to create a decline in global warming. If the trend is not reversed, even adaptation efforts at 1.5°C will prove to be difficult and even more arduous if warming of 2°C is reached. There is an urgent need for increased and more ambitious mitigation.

In a period of climate emergency, a more efficient means to secure survival and sustainable development is to find co-beneficial means to address climate-related issues with efficiency. Efficiency is needed because of the deep concern of the impact of the fast-evolving climate hazards on peoples, ecosystems, assets, and overall development. In the past, adaptation options have resulted in trade-offs or maladaptations that had adverse impacts, such as increasing greenhouse gas emissions, increasing gender and social inequality, undermining health conditions, and encroaching on natural ecosystems. Mitigation efforts may also create trade-offs with adaptation objectives, such as when priorities over bioenergy crops and forest regeneration compete with land needs for agricultural adaptation. This may undermine food security, livelihoods, and ecosystem functions and services. The IPCC points out that synergies between other approaches to address climate issues, adaptation, mitigation, attention to poverty, and Sustainable Development Goals urgently need to be developed.²

Livelihoods are one of the most at-risk dimensions to climate change. Their role in the survivability and sustainability of peoples and ecosystems cannot be understated. Livelihoods depend on the diversity, health, and productivity of ecosystems and humans. The survival of many of the most vulnerable and poorest communities largely depends on the simple extraction of raw forest or coastal resources. The Food and Agriculture Organization (FAO) of the United Nations (UN) underscores that two-thirds of the world's

2 Ibid., p.20.

¹ IPCC, 2018: Summary for Policymakers. In: Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)], p. 9. Retrieved on November 13, 2020 from https://www.ipcc.ch/site/ assets/uploads/sites/2/2019/05/SR15_SPM_version_report_LR.pdf

extreme poor rely on agriculture for their livelihoods and food security.³ And yet, the very diversity, wellbeing, and capacity of ecosystems and peoples to produce are sensitive and susceptible to the nature of livelihoods.

It is in this context that this paper examines examples of community-based and other livelihood initiatives undertaken by ACT Alliance members, bearing in mind that the IPCC affirms a long-standing advocacy of many civil society organizations, that the goals of climate-resilient pathways demand social justice and equity if resilience actions are to contribute to sustainable development.⁴

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³ FAO and Red Cross Red Crescent Climate Centre, 2019, Managing climate risks through social protection – Reducing rural poverty and building resilient agricultural livelihoods. Rome, p.7. Retrieved on November 13, 2020 from http://www.fao.org/3/ca6681en/ca6681en.pdf

⁴ IPCC, supra note 1, at p. 22

Unpacking Climate-Resilient, Low-emission, and Sustainable Livelihoods: A Framework of Analysis

Climate Resilience

In 2011, the IPCC wrote a special report on climate extremes. In 2012, it then defined resilience as "the ability of a system...to anticipate, absorb, accommodate, or recover from the effects of a hazardous event in a timely and efficient manner, including ensuring the preservation, restoration, or improvement of its essential basic structures and functions."⁵ When the IPCC released its Special Report on 1.5°C in 2018, the definition of resilience retained the IPCC Fifth Assessment report definition to cover "the capacity of social, economic and environmental systems to cope with a hazardous event or trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity and structure while also maintaining the capacity for adaptation, learning and transformation."⁶

Others who examine climate extremes also refer to the UN Office for Disaster Risk Reduction definition of resilience, which was affirmed through a UN General Assembly report in 2016, referring to resilience as the "ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner, including the preservation and restoration of its essential basic structures and functions through risk management."⁷

In 2019, an initiative was facilitated by the UN Framework Convention on Climate Change Secretariat to re-examine resilience and shape future resilience under the Nairobi Work Programme. The initiative was called *Resilience Frontiers*. Transformative and regenerative approaches to climate resilience were reflected upon with the consensus of moving toward a "nature-first" culture where the health of ecosystems is considered "a central condition and core criterion for human resilience to climate change." This demands a "global system change translating into new forms of habitats as well as social and economic practices" enabling the "continuous regeneration of societies, economies, and ecosystems."⁸

⁵ IPCC, 2012: Glossary of terms. In: Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change [Field, C.B., V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, G.-K. Plattner, S.K. Allen, M. Tignor, and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, UK, and New York, NY, USA, p. 563. Retrieved on November 13, 2020 from https://www.ipcc.ch/site/assets/uploads/2018/03/SREX_Full_ Report-1.pdf

⁶ IPCC, 2018: Annex I: Glossary [R. Matthews (ed.)]. In: Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [V. Masson-Delmotte, P. Zhai, H. O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J. B. R. Matthews, Y. Chen, X. Zhou, M. I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, T. Waterfield (eds.)], p. 557. Retrieved on November 13, 2020 from https:// www.ipcc.ch/site/assets/uploads/sites/2/2019/06/SR15_AnnexI_Glossary.pdf

⁷ United Nations General Assembly, 2016, *Report of the open-ended intergovernmental expert working group and terminology relating to disaster risk reduction.* Retrieved on November 13, 2020 from https://digitallibrary. un.org/record/852089?ln=en

⁸ Resilience Frontiers. Retrieved on November 13, 2020 from www.resiliencefrontiers.org/vision.

Reflecting on the range of definitions of resilience presented by experts, in dealing with climate change, resilience requires the capacity of both humans and ecosystems to anticipate, resist, absorb, accommodate, adapt to, transform, or recover from hazards in a timely and efficient manner to secure the maintenance, preservation, and restoration of their essential identity, function, and structure that enable continuous regeneration of societies, economies, and ecosystems.

Low Emissions

The European Union–United Nations Development Programme (UNDP) Low Emission Capacity Building Programme defines low-emissions development strategies as ones characterized by "low-carbon" approaches to "achieve sustainable development, based on national socio-economic and development priorities."⁹ UNDP further developed its guidelines and clarified that in identifying priority options to achieve low-emission climate-resilient development objectives the analysis is based on "prospective climate scenarios and current vulnerability and future risks, as well as socio-economic trends and constraints."¹⁰

It bears noting that aiming for low emissions needs to be inextricably linked with Sustainable Development Goals and specific poverty characteristics, particularly country contexts. The FAO notes the key role of agriculture in exacerbating greenhouse gas emissions. In FAO's 2016 report, agriculture "is the second largest economic sector contributing to anthropogenic greenhouse gas emissions (21% in 2010, preceded only by the energy sector which contributed 47%)." Particular agricultural activities that drive climate change are deforestation, livestock production, and soil and nutrient management, and many of the Intended Nationally Determined Contributions point to reducing greenhouse gas emissions from the agricultural sector. This is an aggregate of the contributions coming from industrial agricultural systems and smallholder farmers.

Rough estimates show that smallholder farmers contribute just 5 percent of the total global greenhouse gas emissions coming from farm production and land use change, with around 71 percent of this coming from China, India, and Indonesia. The FAO emphasizes that the drive to curb the contribution of agriculture to climate change by "shifting into low-emission agricultural practices can create disproportionately high risks and costs for the rural poor, whose livelihoods are highly dependent on agriculture, especially in the transition period." That said, there is a great push for smallholders to be early adopters of low-emission or climate-risk-sensitive agricultural practices.¹¹

Sustainable Livelihoods

Over the years, the definition of sustainability, while having multiple uses, remains anchored to a concept of "a dynamic process that guarantees the persistence of natural and human systems in an equitable manner." However, such a process must "meet the needs of the present without compromising the ability

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⁹ United Nations Development Programme, 2010, How-to Guide: Low-emission Development Strategies and Nationally Appropriate Mitigation Actions: Eastern Europe and CIS, NY: UNDP, p.17. Retrieved on November 13, 2020 from https://www.undp.org/content/undp/en/home/librarypage/environment-energy/climate_change/ mitigation/how-to_guide_low-emissiondevelopmentstrategiesandnationallyappro.html

¹⁰ United Nations Development Programme, 2011, EXECUTIVE SUMMARY Preparing Low-Emission Climate-Resilient Development Strategies: A UNDP Guidebook – Version 1, NY: UNDP, p. 10. Retrieved on November 13, 2020 from https://www.undp.org/content/undp/en/home/librarypage/environment-energy/low_emission_ climateresilientdevelopment/preparing-lecrds---executive-summary.html

¹¹ FAO and Red Cross Red Crescent Climate Centre, supra, note 3.

of the future generations to meet their own needs."¹² Applied to the concept of sustainable livelihoods, the FAO uses the Department for International Development UK definition to refer to a set of "capabilities, assets (both material and social resources) and activities required for living that can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining natural resource bases."¹³

Literature on sustainable livelihoods looks at how Sustainable Development Goals are met while developing sustainable production, feeding into entire sustainable food value chains. The UN Environment Programme links sustainability of livelihoods to the viability of smallholder farming systems. Viability rests on sustainable, resource-efficient agricultural practices. This may include improvements in water use, soil nutrient preservation, reducing emissions, and maintaining ecosystems. Alongside more sustainable production practices is the need to develop sustainable food value chains. This encourages examining (1) how individual smallholder farmers and small fishers are affected by the sustainability of raw resources and the inputs they need to be able to produce food, (2) how their own production feeds into a bigger production, processing, distribution, and marketing chain until it reaches the consumer, and (3) how these production value chains in turn affect the success of small producers to produce more sustainably.

At the end of that food chain is the need to look at food waste and how sustainable livelihoods could curb food waste. The UN Environment Programme notes that globally up to 33 percent of food harvested goes to waste. To be able to address both sustainable livelihood production and sustainable food value chains, there is a need to inform, align, and foster collaboration among multiple value-chain actors, decision makers, and practitioners. These stakeholders include farmers, fishers, agribusinesses, governments, and civil society.¹⁴

What is a Climate-Resilient, Sustainable, and Low-Emission Livelihood?

A Climate-Resilient, Low-Emission, Sustainable Livelihood is a set of capabilities, low-carbon assets (both material and social resources), and activities required for living. It can anticipate, resist, absorb, cope, accommodate, adapt to, transform, or recover from climate risks in a timely and efficient manner while maintaining its capabilities and assets now and in the future, ensuring the health and regeneration of the ecosystem and its natural resource bases, economy, and peoples, and contributing to social justice and equity.

For the intervention to be recognized as a climate-related action, strategies, approaches, and actions must be responsive to climate projections and scenarios and to corresponding exposures, and vulnerabilities must be considered. In the context of climate extremes, both current and future climate hazards, exposures, and vulnerabilities must be factored into the analysis. This constitutes the required climate risk analysis. Climate-resilient, sustainable, and low-carbon initiatives must be responsive to the climate risks resulting from risk assessments, contributing to the resilience and sustainability of peoples, ecosystems, and livelihoods and contributing to climate mitigation.

¹² IPCC, 2018, *supra* note 1, at p. 559.

¹³ DFID, 2001, in FAO, "Sustainable Livelihoods: Analysis at the household level." Retrieved on November 13, 2020 from www.fao.org/in-action/herramienta-administracion-tierras/module-1/proposed-methodology/sustainablelivelihoods. See also DFID, 1999, "DFID sustainable livelihoods guidance sheets." p.1. Accessed and downloaded on November 13, 2020 at https://www.ennonline.net/attachments/871/dfid-sustainable-livelihoods-guidancesheet-section1.pdf

¹⁴ UN Environment Programme, "Sustainable Food Production." Retrieved on November 13, 2020 from https://www. unenvironment.org/regions/asia-and-pacific/regional-initiatives/supporting-resource-efficiency/sustainable-food



Elements of Climate-Resilient, Low-Carbon, Sustainable livelihoods

The definition presented attempts to identify elements of climate-resilient, low-carbon, sustainable livelihoods that are informed by widely accepted frameworks for analyses. At first glance, it is a demanding and thought-provoking approach. However, the scale, intensity, and urgency of the risks faced by humanity and ecosystems warrant action in a timely and efficient manner — one that demands co-beneficial mitigation-adaptation action along the continuum of resilience building. UN Secretary-General António Guterres reiterated at the UN General Assembly of 2018 that "Climate change is moving faster than we are." Thus, designing a responsive climate action that meets the targets of the Paris Agreement demands action that is calibrated to the climate risks.

In the subsequent analysis of livelihood interventions, this paper gives due attention to the various elements of the livelihood approaches and strategies. Using the above-mentioned framework, the approaches will be examined to see whether they approximate the characteristics of climate resilience, sustainability, and low-carbon pathways in livelihoods.

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2 Lessons from Livelihood Programmes and Projects of ACT Alliance Members

This section will examine some examples of work from ACT Alliance members to determine whether the elements described in the previously mentioned framework can be found in the livelihood activities undertaken by these members. Where there are gaps, it will identify innovative mechanisms to incorporate principles of co-beneficial climate resilience and sustainability into livelihood interventions. ACT Alliance has developed this publication on Climate-Resilient, Sustainable, and Low-Emission Livelihoods in the hope that good practices, using technological innovations with local knowledge from different regions, are readily available and can inspire similar climate actions.

The scope of available documentation from various ACT Alliance member organizations varies. Where possible, the livelihoods featured in this paper endeavour to cover project objectives, the approach and strategies used, and the initial outputs and outcomes the available documentation provides.

Sustainable Livelihood and Fair Climate Initiatives, UDYAMA/ICCO Cooperation¹⁵

The districts of Bolangir and Nayagarh in Odisha State, India, have been exposed to climate extremes, especially drought, that affected the livelihoods of villagers. ICCO Cooperation supported the work of UDYAMA, which engaged 48 villages to address the livelihood insecurity of some 4200 families.

The main approaches used were agro-ecology and green energy for sustainable livelihoods. Among the specific interventions used were the system of rice intensification, Farmer Field Schools, organic farming, nutrition gardens, fodder cultivation, vermicomposting, and seed banking to enhance farming. Value adding of crops and diversification of livelihoods were also encouraged by providing support for tomato processing, mushroom cultivation, inland fisheries, and social enterprises for ultra-poor women.

To address environmental concerns, the project engaged the villages in biodiversity conservation through forest conservation, forest plantation, and water conservation (for example, rainwater management, digging of ponds, water harvesting, gully control, soil management). Promoting the use of green energy to address energy access concerns was among the main features of the undertaking. Under this, the major activities conducted were a green audit, promotion of biogas technology, biomass training, solar home lighting, and the use of solar dryers.

At the completion of the initiative, five producer groups were formed and were linked to the Agriculture Department and the NABARD and Odisha Renewable Energy Development Agency. The villagers' level of awareness of green energy was enhanced, and the use of biogas, biomass stoves, treadle pumps, gravity flow irrigation, and solar home lights slowly grew. The farming households adopted agro-ecology approaches. Eco-tourism was incorporated in the revenue model that resulted from the undertaking.

¹⁵ Udyama, 2015, *Sustainable Livelihood and Fair Climate Initiatives in Odisha: A small Walk Towards Big Dream.* Retrieved on November 13, 2020 from https://www.academia.edu/27917948/Actions_and_reflections_ on_Sustainable_Livelihood_and_Fair_Climate_Report

Doba-Based Livelihood Programme, Bread for the World, Germany, through Churches Auxiliary for Social Action¹⁶

In West Bengal, India, smallholder farmers attempt to conserve water while contributing to emissions reduction. Rainfall harvesting with the use of dobas (small human-made pits) is done during the wet season so there is water to irrigate crops during dry months. While a traditional practice, the reshaping and conservation of dobas have contributed to crop health during cultivation and productivity in livelihoods. The doba-based livelihood programme supported by ACT members Bread for the World (BftW) and Churches Auxiliary for Social Action (CASA) was implemented in Habibpur Block of Malda in the Barnd District where subsistence farming is more prominent. Farmers cultivate cereals, oil seeds, sugarcane, vegetables, and pulses purely for subsistence. CASA institutionalized the doba-based livelihoods mainly among the tribal people by linking indigenous knowledge with academic research. Because fishing is the primary source of protein for the rural poor the initiative focused on the ecological effects of preserving traditional small fish cultivation.

Through the Rajadighi Community Health Service, BftW and CASA were able to support the revival of the use of local dobas, previously unused, as a source of water for agriculture. Institutionalizing doba-based livelihoods gave the community the opportunity to link indigenous knowledge with scientific practices that came with capacity building via the project. As an example, the project worked with the community to give attention to traditional small fish cultivation and its ecological as well as nutritional benefits for the community. To prevent soil erosion, conserving and growing local plants and grasses along the doba embankments were encouraged. This spurred household participation in water conservation infrastructure for healthy homesteads through the dobas.

Sustainable agriculture seed fish cultivation, and animal husbandry were introduced to further enrich livelihoods. Diversification of crops was introduced around the dobas. Planting of fruit trees like guava, lemon, mango, jackfruit, and banana was encouraged for food diversity and security alongside home-based gardening.

The project raised levels of awareness of the value of the landscape to livelihoods and food security. Where there are natural depressions in land, community members have learned to maintain and use groundwater recharge basins that not only provide irrigation to home gardens, but also enhance water supply for household needs.

Habbanaye: Traditional Practice for Resilience, Lutheran World Relief¹⁷

Pastoralist and agricultural activities characterize livelihoods in the Sahel Region in Africa. These livelihoods largely depend on the regularity of the seasons. In the 1970s, precipitation declined, and the Sahel became more exposed to prolonged dry spells and drought, which affected the capacity of communities to produce food for subsistence and income. In search of culture-based livelihood options

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¹⁶ Eva Perroni, "Indian Farmers Are Turning Dumping Grounds into Water Saving Basins." Food Tank, 2017, Accessed on November 13, 2020 at https://foodtank.com/news/2017/07/india-farmers-taking-novel-approachdrought-adaptation.

¹⁷ Lutheran World Relief, 2019, "Habbanaye: Applying a Traditional Practice for a More Resilient Future in Sahel." Retrieved on November 13, 2020 from https://lwr.org/technical-resources/habbanaye-applying-traditionalpractice-more-resilient-future-sahel

that could help address issues of vulnerability, Lutheran World Relief (LWR) turned its attention to habbanaye, a traditional practice of Fulani pastoralists in West Africa, Niger. Habbanaye is a system whereby more economically endowed families loan female cows, sheep, or goats to poorer family members or friends. The poorer family member or friends then keep the offspring of the borrowed animals so they can also raise their own stock. The ruminants stay with the family until an offspring is born and weaned. Then it is time for them to be turned over to another habbanaye participant. Once ruminants enter the habbanaye cycle, they become a common asset, so that the care of the animals becomes a social responsibility of the local women's group. The latter requires insurance contribution for the care of animals.

LWR used the approach in Sahel, specifically in Burkina Faso, Mali, and Niger, with roughly 2,500 participants. The habbanaye approach used by LWR is governed by local women's groups. This is because this traditional practice is a known drought contingency mechanism of women in pastoral communities, especially when men travel in search of grasslands for cattle and women are left behind to tend to their households. Social equity in the habbanaye approach is determined in a participatory manner, for example, what and how many goats can be cared for.

Accompanying capacity building with good governance, management training, partnership with veterinary experts, and training for para-veterinary services are incorporated in the approach to sustain the initiative. Other support services include the creation of animal feed warehouses, veterinary care and vaccinations, fattening for animals, and ensuring co-benefits for households through milk production and consumption for better nutrition.

The habbanaye approach taught LWR valuable lessons in livelihood work. Among them are the following:

- · Incorporate food source for the animals throughout the project cycle.
- Engage the government in the project implementation.
- Ensure community participation through the entire duration of the project.
- Purchase animals locally where available.
- · Local knowledge is highly valuable in such initiatives.
- · Invest in new rams.
- Flexible and low contributions to fund the care and insurance of the animals encourage social responsibility.

The initiative yielded social and practical benefits, especially for women. Project documentation highlights the increase in access to milk for households and the enhanced social standing of women in remote and rural poor communities because they can have their own livelihoods and sources of income. Moreover, their social and financial capital have been enhanced with the establishment of the Habbanaye Solidarity Groups (HSG). The HSG are essentially self-managed by the women in communities. These groups help provide for basic financial services like savings, loans, and insurance. Loans are normally given for revenue-producing activities but are also extended for family celebrations and emergencies. Social capital has been enhanced via the trust-building process developed in the HSGs and the social networks and collaborations established. The capacity to self-organize and to explore solution-seeking pathways to sustain the habbanaye practice is a skill that has multiple uses for resilience purposes.

Mushroom Cultivation in Odisha, Lutheran World Service India Trust¹⁸

Challenged by inundation, where land is submerged in saline water, the capacity of the residents of the village of Resinga in Puri District, Odisha State, India, to grow food was affected. This has a direct impact on their food security and health. Social relationships are also affected because the men of the village must move out in search of livelihoods while the women remain to care for their children and the household.

Lutheran World Service India Trust (LWSIT) encouraged women to venture into alternative livelihood options through mushroom cultivation to address the issue of food security. Women and men were trained as a start. Eventually, the success of the initiative turned into family- and community-based ventures involving 112 of the 200 families in the village. A gender division of labour helped sustain the engagement, with the men procuring raw materials and women and men cultivating the mushrooms together.

The success of the initiative earned Resinga the moniker "mushroom cultivation village." There, each farmer raised roughly 326 kilograms of mushrooms. Sold at approximately 110 Indian rupees (1.75 US dollars) per kilogram, that earns each household a net profit of Rs 36,000 Indian rupees (600 US dollars) per month.

This livelihood intervention has brought a steady source of income and food security to the households. The benefits of the project allow children to be educated and fed balanced meals and to have their health needs addressed.

Greening the Economy of Urban Agriculture at Kanata Metropolitan Area, Bolivia, Diakonia¹⁹

Diakonia worked with its local partner Centre for Supporting Integral Management of Water and the Environment (Agua Sustentable) in Kanata, Metropolitan Area, Bolivia. The project aimed to apply technology, adaptation and mitigation to green the local economy through urban agriculture.

Diakonia and Agua Sustentable engaged in the initiative to support the implementation of the Sustainable Cochabamba Action Plan. Climate change will challenge water access of agricultural communities in upland communities. Agua Sustentable has been examining climate models alongside vulnerability analysis to assess impacts and develop adaptation plans to enable capacities for sustainable access to water in communities, which can help sustain livelihoods and address other needs. The initiative involved applying photovoltaic pressurization technologies that support water recycling for irrigation and compost production. Working with communities, the project developed production protocols of climate-resilient vegetables and flowers. To further contribute to the reduction of greenhouse gas emissions, microfinancing supported urban agriculture using a 3R (reduce, reuse, recycle) approach. The initiative had a strong inclusive approach targeting women's productivity as well as the development of green business models through public–private partnerships guided by rights-based and gender equality approaches.

¹⁸ ACT Alliance, 2018, "Mushroom Cultivation: A climate-smart livelihood model." Retrieved on November 13, 2020 from https://actalliance.org/act-assembly-posts/mushroom-cultivation-a-climate-smart-livelihood-model

¹⁹ Nordic Development Fund, 2016, NCF: Technology, Adaption, and Mitigation: Greening the economy of urban agriculture at Kanata metropolitan area, Bolivia (NDF C82B2). Retrieved on November 13, 2020 from https://www.ndf.fi/project/ncf-technology-adaptation-and-mitigation-greening-economy-urban-agriculture-kanata

The work of Agua Sustentable with Diakonia yielded four production protocols developed by women's organizations. This featured the cultivation of lisianthus and carnations using enhanced water efficiency and encouraged early adaptation. Moreover, a trust fund was also developed to ensure sustainability in access to credit for waste water treatment plants and other technical solutions. An initial 10 million US dollars equity investment has been set up. About 3101 women have incorporated adaptation strategies in urban agriculture. Together with other stakeholders, Agua Sustentable and Diakonia have developed a hydro cannon technology for risk and basin management. The application of various mitigation strategies in water management, recycling, and processing of organic residues in the project estimated the reduction of 93.42 tons of CO2 emissions.²⁰

Renewable Energy for Climate-Smart Agriculture, Churches Action in Relief and Development²¹

In an attempt to contribute to climate mitigation while addressing poverty challenges in Malawi, Churches Action in Relief and Development (CARD) implemented a climate-smart agriculture approach. CARD used renewable energy technologies to help enhance productivity and income and enable resilience in agriculture. Implementing a programme on Renewable Energy for Rural Communities, CARD worked with communities in Nsanje, Mulanje, and Thyolo in Malawi to provide solar-powered irrigation schemes and ensure access to potable water using a solar-powered gravity water supply system.²² The latter initiative built the capacities of communities involved were able to set up a fund for maintaining the water system. This was meant to complement the efforts of the local office of the Department of Water and Agriculture for long-term maintenance. The project also secured water for irrigation under sustainable extraction schemes while meeting the needs for water sustenance of 1430 people. Water access for the most vulnerable sectors of the population (children, elderly, disabled members) was given due consideration.

On top of this, energy-efficient cookstoves, solar-powered processors (for example, for peanut butter), solar lamps, and solar-powered energy kiosks were also used in the work of CARD in the communities.²³ In Nsanje, solar-powered irrigation allowed 320 farming households to cultivate crops. In Mchinji, renewable energy access allowed 1500 beneficiaries to develop value-adding livelihoods, such as processing groundnuts into peanut butter, and to create new livelihoods, such as barber shops and cellphone charging.

²⁰ Nordic Climate Facility Initiative by NDF, 2019, "Final Report: Technology, adaptation and mitigation: Greening the economy of urban agriculture at the Kanata Metropolitan Area, Bolivia." p.26. Retrieved on November 13, 2020 from https://smartme.adalia.fi/NCF/fact_sheet/document/8054/field_XWJFUubB:dJ8LPKlo

²¹ Churches Action in Relief and Development, Renewable Energy Sources. http://www.cardmalawi.org/index. php/2018-09-18-08-30-41/2018-09-19-04-10-33.

²² Ecumenical Water Network (EWN) and ACT Alliance, "Sunny Times for Water: A Solar-Powered Gravity Water Supply Scheme." Retrieved on November 13, 2020 from https://www2.ohchr.org/english/issues/water/iexpert/ docs/questionnaires2010/Malawi_CARD_Sunny_times_for_water.pdf

²³ Malawi Energy Regulatory Authority, 2016, "Renewable Energy for Climate Smart Agriculture." https://www. meramalawi.mw/index.php/news/latest-news/56-renewable-energy-for-climate-smart-agriculture

Biochar Ecosystems, Christian Commission for Development in Bangladesh/ICCO-Cooperation/Kerk in Actie²⁴

Rising sea levels facilitate salinization of land through sea water encroachment in Bangladesh. Fertile land was being lost in the process, making agriculture challenging. The Christian Commission for Development in Bangladesh (CCBD) worked in three locations in rural Bangladesh and partnered with soil scientists to find means of addressing the problem of salinization. In the process, its attention was pointed to biochar. Biochar works as a soil conditioner that enhances plant growth and health. It is a specialized form of charcoal. While innovating on a top-lit updraft (TLUD) gasifier for cookstoves, they were able to design the Akha-Agriculture Friendly Stove, which can produce biochar as a by-product of cooking. The Akha stove reduces use of wood for fuel by 25 to 30 percent and produces free fertilizer for farmers. Subsequent application of biochar by-product on soil enhances soil organic matter. Hence, a TLUD/biochar ecosystem was conceived.

"Biochar is extremely porous which allows it to retain nutrients and water — which plant roots can access when the Biochar is added to the soil. It decomposes very slowly in the soil. The composting of Biochar creates a thin carbon-coating that gives it its miraculous fertilizing properties. The organic coating enhances the Biochar's ability to store nutrients, such as nitrates and phosphates, and it strengthens interactions between Biochar and the soil leading to the slow release of nutrients."²⁵ By facilitating soil fertility, biochar is expected to contribute to crop productivity. In a study of biochar application in Shivalaya Upazila of Manikganj district, respondents affirmed yield increment, better taste and crop colour, and increased market prices of crops. Among those crops that evidence high yields were eggplant, tomato, cauliflower, and chili. The process of producing biochar also illustrates rural women's empowerment and rural women's contribution to reducing CO2 emissions. Agriculturally-friendly, low cost cooking stoves which produced biochar as a residue after cooking were distributed among rural women. In the project areas, it was usually rural women who used the cooking stove.²⁶

Climate Adaptive Farming, YAKKUM Emergency Unit²⁷

Long periods of dry weather pose a huge challenge for agricultural communities in karst areas like Gunungkidul District in Yogyakarta, Indonesia. The shifting weather patterns and extreme weather conditions result in an alarming rate of evaporation and the subsequent drying of lakes and ponds and increased incidence of pests and plant diseases. The end result is crop failure, which often spells reduction or loss of income and unsustainable livelihoods for these agricultural communities. Some farmers would abandon farmlands and look for odd jobs where income is guaranteed even if unstable.

²⁴ Bangladesh Biochar Initiative, 2018, "Seminar Proceeding — Biochar for Food Security, Livelihoods, and Combating Climate Change." Retrieved on November 13, 2020 from http://www.biochar-bangladesh.org/seminarproceeding-biochar-for-food-security-livelihoods-and-combating-climate-change.

²⁵ CCDB, ICCO, KERK in ACTIE, 2018, "Proceedings on Biochar for food security, livelihood and combating climate change." Retrieved on November 13, 2020 from http://www.biochar-bangladesh.org/wp-content/ uploads/2018/10/2018_7_Biochar-Seminar_Proceedings.pdf.

²⁶ Ibid.

²⁷ ADRRN Tokyo Innovation Hub, 2018, "Climate Adaptive Farming in Indonesia." Retrieved on November 13, 2020 from https://adrrninnovationhub.org/case/climate-adaptive-farming-in-indonesia.

With funds from the Indonesia Climate Trust Fund, YAKKUM Emergency Unit (YEU) worked in eight villages in Gunungkidul with the aim of food security through climate-adaptive farming. This programme shifted farming practices toward organic farming, selection of drought-resistant local seed varieties, breeding high-quality seeds, such as inbred irrigated lowland rice (INPARI), and biological pest control. This resulted in a 60 percent increase in crop harvests. Farmers also tried to examine suitability of seeds to the ecosystem by using the Sidenuk variety of INPARI, which is suitable for lowland rice ecosystems that are more resistant to pests and disease.²⁸

Farmers also learned to prepare alternative livestock fodder, particularly during dry seasons. The initiative also allowed farmers to access climate-related information to prepare for necessary adaptation options.

Women's Entrepreneurship to Supply Clean Energy, Solar Sister/United Methodist Committee on Relief

Energy access is an aspiration for many remote communities. In Tanzania, the United Methodist Committee on Relief (UMCOR) supported the non-profit organization Solar Sister, which invested in local women's enterprises that aim to give clean energy access for all. Solar Sister provides capacity building and technical support to local entrepreneurs and supplies them with durable, affordable solar-powered products and clean stoves that will enable women entrepreneurs to build sustainable businesses alongside their existing livelihoods like basket weaving or farming.²⁹ The training package is accompanied by mentoring on business, leadership skills, technology, customer care, trust-building, financial management, and savings. Solar Sister's business model also incorporates accountability as a value. Customer care includes giving receipts to customers and offering a warranty.³⁰ Since the Solar Sister model encourages solar entrepreneurship as a supplemental rather than an alternative income source, women are still able to engage in their traditional livelihoods, such as farming or weaving, but earn extra income from being solar entrepreneurs.

Of the 240 women reached, it has been estimated that five other people in their respective communities will benefit from each solar item sold. So far, a minimum of 24,400 solar items have been sold and directly benefited 122,000 people. Money saved from not purchasing kerosene means funds can now be diverted to food, health, school needs, and other essential expenses. Access to solar lights will also give women more hours for their home-based livelihoods and more learning time for children.³¹

²⁸ Humanitarian Innovation Fund, 2018, "Humanitarian Innovation Fund: Seed Funding Final Report." Retrieved on November 13, 2020 from https://www.elrha.org/wp-content/uploads/2018/08/HIF-Seed-Funding-Report_YEU_ Indonesia.pdf

²⁹ Solar Sister, "Our Model," Retrieved on November 13, 2020 from https://solarsister.org/what-we-do/our-model.

³⁰ *Ibid*.

³¹ Barbara Dunlap-Berg, "Illuminating joy: Solar energy casts out darkness in Tanzania and Liberia." Retrieved on November 13, 2020 from http://webcache.googleusercontent.com/search?q=cache:Dx6dPPzGf_YJ:https://www. umcmission.org/year-end-giving/illuminating-joy-solar-energy-casts-out-darkness-in-tanzania-and-liberia&hl=en &gl=ph&strip=1&vwsrc=0

Environmental Protection, Food Security, and Economic Strengthening, The Salvation Army³²

Biodiversity degradation is a big risk to subsistence households around the Mount Elgon National Park and ranges in Uganda. This project was implemented in six sub-counties in the Manafwa District. The intervention begins with environmentally sound district planning and addressing the root causes of biodiversity degradation and food insecurity. It provides support for sustainable agriculture, nutrition, and climate-adaptive livelihoods that are co-beneficial to conservation of natural resources and environmental services.

As outlined in an assessment study on the project, the project has a multi-dimensional scope: (a) gender and development access to and control over environmental resources, (b) nature-based income-generating activities, and (c) use of renewable energy and energy-saving technologies, among others. The use of biogas, for instance, led farmers to the discovery of the biogas slurry, a by-product of biogas, that they now use as animal feed and organic fertilizer. Biogas slurry, when composted properly, results in a high-quality fertilizer and conditioner that could result in higher crop yield. This, in turn, translates to higher income for farmers.

On top of these, the farmers revisited their traditional farming practices and adopted better farming technologies. Lessons learned were then shared during capacity-building activities. These include "integrated pest management and disease control, use of organic manure, mixed cropping, post-harvest management, farm-planning, soil and water conservation, integrated farming and sustainable agriculture, animal management and production, kitchen gardening, efficient, agro-ecological practices."³³ They also received technical support around agronomic practices.

Project assessment shows that nearly all beneficiaries (97 percent) engaged in crop farming compared to the baseline of 61 percent. The farming households also pursued poultry farming, and there has been an increase in animal rearing and trade. Households also derived increased income from coffee, onions, maize, and beans. Moreover, there was further encouragement to explore nature-based livelihoods like beehive/beekeeping to augment incomes.

Women were also reported to participate in home-based enterprises from the produce of their home garden and from poultry raising. At the time of the assessment, around 703 households established home gardens that improved food production, access, and security, as well as nutrition. The initiative also resulted in diversification of livelihoods. The income diversification was further augmented by market support and savings and investment capacity building.

³² Paul Bukuluki, et al., 2017, "Project Mid Term Evaluation: Environmental Protection, Food Security, and Economic Strengthening (EPFOSE) Project Manafwa District Uganda." Retrieved on November 13, 2020 from https:// norad.no/globalassets/publikasjoner/publikasjoner-2017/sivsa-evalueringer/project-mid-term-evaluation_ environmental-protection-food-security-and-economic-strengthening-epfose-project.pdf

³³ Ibid.

Empowering Small Island Communities of Resilience and Sustainability, ICODE/ Christian Aid³⁴

An archipelago sitting beside the Pacific, Philippines is home to over 7000 islands that are exposed to climate extremes and slow-onset events. Iloilo Caucus of Development Non - Government Organizations, Inc. (Iloilo CODE NGOS, Inc. or ICODE) worked in 28 island and coastal villages in the municipalities of Carles, Estancia, and Concepcion in Iloilo, Philippines. Among these islands 11 coastal and island villages were engaged in the work on enhanced sustainable and resilience livelihoods and enterprises.

The impact of typhoons has damaged corals and coastal and marine resources. This aggravates the depletion of marine resources due to overfishing. Climate change has affected sea surface temperature and has caused stronger waves, making it more difficult for small fishing vessels of poor fisherfolks to navigate the seas. With their limited capacity to fish and with the declining fishery stocks, a clear need for livelihood enhancement exists.

The intervention in the small island ecosystems consisted of transplanting corals using artificial reefs, mangrove reforestation, enhancing community-based protection of marine protected areas, enhancing seaweed plantation and productivity, and food processing to reduce the pressure on the fishery resources while the ecosystem is in the process of restoration. The initiatives were accompanied by a community savings and loan programme largely managed by women.

Small islands in the Philippines have limited energy access. Through innovative solar energy projects, solar home systems were made available alongside solar units that power community water pumps and water filtration systems, lighting and ventilation for health centres, refrigeration for rural health units, and battery charging stations. The availability of energy in the small islands made it possible for fishing households to develop supplemental livelihoods to fishing like ice-making and baking bread. Community-led solar enterprises also surfaced and have led to the formation of a co-operative type of solar energy enterprise with 166 members as of 2019. Income reflow has been incorporated into the strategy and has led to the development of six social enterprises serving 200 households.

Café Project, Lutheran World Relief³⁵

On the slopes of Mount Elgon in Uganda, smallholder farmers face the challenge of maintaining the quality and quantity of their crops amid the changing climate, rainfall-induced landslides, and irregular precipitation. The initiative developed the capacities of partners in understanding the microclimate and the coffee value chain and enhancing the equitable service of co-operatives to members. Alongside these initiatives were institutional strengthening of farmer associations, technical support to farmers, and financial management support to address cash flow issues within the production cycle. The extension service used digital platforms that allow workers to access needed information as well as to encode data from the field. The work of Lutheran World Relief (LWR) also encouraged stewardship using biodiversity conservation, agroforestry principles and approaches, soil and water conservation, and climate-adapted crop varieties.

³⁴ Emmanuel Areno, 2019, "Experiences in Empowering Communities of Small Island in Resilience and Sustainability, Philippines." PowerPoint presentation.

³⁵ Lutheran World Relief, "Measuring Resilience: A Study from the Café Project in East Africa." Retrieved on November 13, 2020 from https://lwr.org/technical-resources/measuring-resilience-study-cafe-project-east-africa and https://lwr.org/technical-resources/measuring-resilience-study-cafe-project-east-africa-summary

The entire approach used a theory of change aimed at building resilience to climate stressors using adaptive and transformative pathways. At the core of the approach was strengthening social capital that would contribute to the strength of the human, physical, environmental, and economic capitals of a community. Each form of capital was analyzed in relation to the climate stressors and respective resilience capacities. The theory of change proposes that when the capacities of each capital are strengthened via the climate stressors, overall resilience to climate change factors will be enhanced.

Adaptive measures utilized include (1) increase in knowledge of climate risks, (2) mechanisms to address climate impacts, (3) access to and use of crop insurance, (4) application of agroforestry principles and approaches, (5) use of soil and water conservation measures, (6) use of climate-adapted crop varieties, and (7) the acquisition of inputs from farmers' organizations. Several transformative measures were promoted. The project supported the institutional strengthening and governance resilience of farmers' organizations, especially around operations and application of a core business model. It also encouraged better management protocols addressing climate stressors, enhanced leadership skills, the acquisition of farm inputs from farmers' organizations, and access of farmers' organizations to larger markets.

Sustainable Social Cocoa Enterprise, Soppexcca/Christian Aid³⁶

The changing climate has been affecting coffee growing in Nicaragua as the leaf rust disease accompanied the changing weather patterns. Farmers in Jinotega, Nicaragua, started to turn to cocoa as an alternative crop adaptive to the changing climate. However, cocoa production is only one aspect for consideration in finding alternative livelihoods. Farmers soon discovered that the sustainability of cocoa production is largely linked to financial planning, financial and accounting management, management of sales contracts, and stability of assets.

The production of cocoa already benefits from scientific information on future climate scenarios from the Nicaraguan Meteorological Service for a climate-adaptive production of cocoa. Soppexcca, a coalition of 18 cooperatives with 650 members, and Christian Aid pursued an initiative to access blended finance. The livelihood support pursued was able to access funds from the Inter-American Development Bank to provide technical assistance to farmers so that their cocoa venture would reach commercial viability and generate economic, social, and environmental co-benefits of smallholder farmers, households, and communities.

Specific interventions include a gender and development approach to the diversification model for income, access to formal credit, cash-flow management in the context of diversified incomes, and the establishment of a revolving fund that finances the quality cocoa production process. Interventions also include the application of agroforestry systems in the management of cocoa farms and establishment of organic production processes and access to high-value markets, among others. The project specifically provided opportunities for participation for women and youth.

³⁶ Christian Aid, 2015, "Enriching the lives of marginalized producers: inclusive market development." Retrieved on November 13, 2020 from https://beamexchange.org/uploads/filer_public/cd/c2/cdc215f0-8a60-4db3-aa58-5ab88d38e7fe/inclusive_market_development_christian_aid.pdf.

The work in Nicaragua equipped around 400 coffee producers to diversify income sources by also engaging in cocoa production using science-informed selection of climate-resilient varieties of cocoa and enabled them to produce high-quality chocolates through interventions of climate-smart agriculture, inclusive market access, and financial management. The high-quality cocoa led Soppexcca to a contract with Ritter Sport from a start of 500 kilograms to 2200 kilograms per month. Beyond this, Sopexcca now has a chocolate factory that sells produce nationally. Soppexcca won third place among 157 chocolate producers in Central America. It is now able to assist cocoa producers on their own without external help.³⁷

³⁷ Christian Aid, 2019, "Ten years of innovation against global poverty: A review of In Their Lifetime." https://www. christianaid.org.uk/sites/default/files/2019-10/ITL%2010%20year%20report.pdf , pp. 5–7.



This section reviews the above-mentioned livelihood interventions from ACT Alliance members based on the elements of the Climate-Resilient, Sustainable, and Low-Emissions Livelihoods Framework.

Case	Use of Climate scenarios, analyses of risks, vulnerabilities	Timely and efficient anticipation, resistance, absorption, coping, accommodation, adaptation to, transformation, or recovery from climate change- related hazards	Maintenance or enhancement of capabilities and assets, both now and in the future	Use of low- carbon assets and activities	Targeting the health and regeneration of ecosystems	Facilitate social justice and equity
Sustainable Livelihood and Fair Climate Initiatives, UDYAMA/ ICCO Cooperation	Risk analysis conducted	Risk management for adaptation to drought	Enhanced human, economic, environ- mental assets	Green energy initiatives	Biodiversity conservation	Empowerment of farmers; social enterprises for poor women; access of government support
Doba-based Livelihood Programme, Bread for the World, Germany, through Churches Auxiliary for Social Action	Climate risk analysis conducted	Water management for water security	Enhanced human and ecosystem assets	Low-carbon livelihood inputs	Ecosystem restoration	Reclaim power over the issue of drought through innovation in water management
Habbanaye: Traditional Practice for Resilience, Lutheran World Relief	Climate risk analysis conducted	Enhance adaptive capacity through alternative livelihood	Reproduction of economic assets	Low-carbon livelihood inputs	Animal feed warehouse to lessen pressure on pasturelands	Improved social and economic stature of women
Mushroom Cultivation in Odisha, Lutheran World Service India Trust	Climate risk assessment conducted	Alternative livelihood as a form of risk management	Human capacities developed for social enterprise	Low-carbon inputs	No significant intervention but no additional pressure on ecosystem	Income and food security, access to education, health and well- being
Greening the economy of urban agriculture at Kanata Metropolitan Area, Diakonia	Climate risk assessment conducted	Enhanced resilience and adaptation through adaptive production protocols	Adaptive urban agriculture capacities enhanced	Use of photovoltaic pressurization to improve water systems; waste management to reduce emissions	Enhanced local management systems for organic residue	Use of rights- based and gender equality approaches to sustain access to water; supporting livelihoods, particularly in upland contexts; 23 percent increase in women's income

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Case	Use of Climate scenarios, analyses of risks, vulnerabilities	Timely and efficient anticipation, resistance, absorption, coping, accommodation, adaptation to, transformation, or recovery from climate change- related hazards	Maintenance or enhancement of capabilities and assets, both now and in the future	Use of low- carbon assets and activities	Targeting the health and regeneration of ecosystems	Facilitate social justice and equity
Renewable Energy for Climate-Smart Agriculture, Churches Action in Relief and Development	Climate risk analysis conducted	Reduction of livelihoods vulnerability	Capacities developed for water management, renewable energy, livelihoods	Renewable energy use for households, livelihoods, water access	Water system management	Renewable energy access for the poor
Biochar Ecosystems, Christian Commission for Development in Bangladesh/ ICCO- Cooperation/ Kerk in Actie	Climate risk assessment conducted	Reducing the susceptibility of the soil and enhancing capacities for production	Enhanced capacities for ecosystem management	Low-carbon interventions	Soil ecosystem restoration Enhanced biodiversity	Increased food security and income for the target households
Climate Adaptive Farming, YAKKUM Emergency Unit	Climate risk assessment conducted	Climate- and ecosystem- sensitive agriculture technologies	Use of ecological approaches that reduce impact on ecosystem	Low-carbon interventions	Ecosystem protection using organic farming	Access to information and increase in income for the poor
Women's Entre- preneurship to Supply Clean Energy, Solar Sister/ United Methodist Committee on Relief	Climate risk analysis had not been mentioned in existing documentation	Enhance financial resilience by reducing financial vulnerability	Enhance human, economic, social capacities	Solar entre- preneurship	Emissions reduction	Renewable energy access for the poor
Environmental Protection, Food Security, and Economic Strengthening, The Salvation Army	Climate risk analysis not specifically conducted based on existing documentation	Reduce susceptibility of environmental resources through environmental protection	Enhance human and economic capacities in agriculture Enhance environmental capital through nature-based approaches	Energy efficiency and renewable use	Environmental protection Use of nature- based options	Increase income through livelihood diversification and participation, particularly for women

Case	Use of Climate scenarios, analyses of risks, vulnerabilities	Timely and efficient anticipation, resistance, absorption, coping, accommodation, adaptation to, transformation, or recovery from climate change- related hazards	Maintenance or enhancement of capabilities and assets, both now and in the future	Use of low- carbon assets and activities	Targeting the health and regeneration of ecosystems	Facilitate social justice and equity
Empowering Small Island Communities of Resilience and Sustainability, Iloilo Caucus of Development Non- Government Organizations, Inc. (ICODE)/ Christian Aid	Climate risk assessment conducted	Ecosystem resilience measures alongside livelihood diversification for financial resilience	Enhance capacities for environmental protection and restoration of marine ecosystem Livelihood diversification to reduce pressure on fishery resources	Renewable energy-based entre- preneurship	Ecosystem restoration and environmental protection	Supplemental and alternative livelihood access for marginal fishing households Social transformation toward responsible fisheries
Café Project , Lutheran World Relief	Climate risk assessment conducted	Application of anticipatory measures to farm planning Enhancing resilience of coffee to climate stressors via adaptive and transformative measures	Institutional strengthening of farmers' organizations for governance resilience Enhancing social capital with co-benefits to human, physical, environmental, economic captials	Low-carbon intervention	Use of biodiversity, conservation, agroforestry principles and approaches, soil and water conversation, and climate- adapted crop varieties	Equitable service in co-operatives Access to information Enhanced leadership Enhanced role of farmers' organizations in the coffee trade
Sustainable Social Cocoa Enterprise, Soppexcca and Christian Aid	Climate risk assessment conducted	Climate-adaptive cocoa varietal selection	Strengthening of human capacities, financial systems, and market access	Low-carbon intervention	Use of agroforestry for environmental health	Women's and youth's participation Access of small holders to formal credit and larger markets

On the Use of Climate Scenarios and Analyses of Risks and Vulnerabilities

While most of the projects did develop approaches responsive to their analysis of the climate stressors in relation to community exposure and vulnerabilities, the climate stressors examined are historical and current hazards or climate extremes, except for the cocoa project of Soppexcca and Christian Aid in Nicaragua, which explicitly said they used climate scenarios for the varietal selection of cocoa. For purposes of co-beneficial adaptation and mitigation action, the examination of the climate risks must be able to factor in future climate scenarios. This constitutes examining not only climate projections but also the accompanying exposures and vulnerabilities, depending on the development pathways considered. By doing so, the livelihood interventions to reduce exposures and vulnerabilities, for adaptation and mitigation, can be calibrated according to the climate stressors.

On the timely and efficient anticipation, resistance, absorption, coping, accommodation, adaptation, transformation, or recovery from climate change-related hazards

All the livelihood interventions were impressive in the extensive application of technologies that reduce susceptibility of soil, plants, water, and livelihood activities from climate stressors. For instance, there were interventions that specifically focused on addressing soil fertility when faced with salinization and designing water catchments that can capture precipitation in preparation for dry spells. While many of the interventions really enabled coping and adaptive capacities, there are cases of deliberate application of transformative approaches that focused on governance systems. For example, the Café Project institutionalized farmers' organizations so that the different components of the livelihoods value chain could be better managed and maximum benefits could be made available to farmers.

It is also important to note that most of the interventions benefited from scientific inputs by other stakeholders they engage with, whether from scientific and academic institutions or government agencies tasked to address climate change–related concerns. This highlights the importance of multi-stakeholder and trans-disciplinary approaches in livelihoods so that an array of endogenous and exogenous options can be made available to communities for informed decision-making.

On the maintenance or enhancement of capabilities and assets both now and in the future

As noted in the table, the livelihood interventions attempted to enhance capacities and assets for current and future purposes. Even in the use of traditional approaches, such as the habbanaye, the intent was to improve on the existing system so that the women in the community and their households would get enhanced benefits, such as milk for better nutrition, and incentives, such as insurance, to sustain the initiative despite challenges. Enhancement of human, social, environmental, and physical capital were key elements that were essential to the development of economic and financial assets in many of the livelihood examples discussed.

On low-carbon assets and activities

While there were livelihood interventions that did not explicitly target lowering of emissions, the project activities, including the inputs used, were low-carbon emitting for the most part. In several examples, there was a deliberate intent to use green and clean energy even if the end goal of a project component was energy access. Where energy access is related to livelihoods, social enterprises encouraged the use of

renewable energy that will guarantee a better return of investments for social entrepreneurs, such as the case of women's entrepreneurship to supply clean energy in Tanzania.

Low-carbon pathways may be illustrated in efforts of the projects to engage in fuel-efficient stoves and various initiatives to improve soil quality through agro-ecosystems improvement. The use of biochar, engagement in organic farming techniques, and agroforestry methods that prevent soil runoffs contribute to soil and biome improvement. These restorative land use practices improve the capacity of soil to absorb CO_2 and CH_4 and increase the soil organic carbon, with an accompanying co-benefit of increased agricultural productivity.³⁸

On targeting the health and regeneration of ecosystems

A key feature of the livelihood interventions examined was the use of nature-based solutions for resilience building. Although the direct link between ecosystem protection and restoration and climate change is not explicitly explained in most project documents, the livelihood interventions express an understanding of and appreciation for the ecosystem well-being as essential to the resilience of the livelihoods they are developing with communities. The doba-based livelihood project raised awareness of the value of the landscape to livelihoods and food security and groundwater recharge basins. The sustainable livelihood project of UDYAMA/ICCO had part of its initiative working on forest conservation and forest plantation. Stewardship is a central feature of most initiatives. Moreover, there is an emphasis on the co-benefits of the livelihood interventions to the ecosystems as shown in the example of organic farming and ecosystems restoration or the example of diversification of crops and biodiversity conservation.

On facilitating social justice and equity

Livelihoods for well-being must address power inequities in their multiple forms. To a certain extent all the examples aimed at enabling access to information necessary to empower livelihood decision-making. There were projects that clearly targeted issues of food insecurity, insufficient incomes, lack of energy access and livelihood diversity, and lack of political efficacy in decision-making along the lines of livelihood decision-making, as in the case of farmers' organizations. There were also attempts to address market issues wherever they were unfavourable to the marginalized farmers or women. Projects such as those of Soppexcca and Christian Aid also show that there is space for smallholders in larger markets where quality production processes and inclusivity in market systems can be achieved.

The projects also directly involved the more vulnerable sectors of the communities, and the resulting positive changes led to the recognition of indigenous traditional farming methods and the empowerment of women in rural poor communities. The doba-based livelihoods in India by BftW Germany and CASA, the support for ultra poor women in the sustainable livelihood project of UDYAMA/ICCO, the habbanaye practices of Fulani pastoralists in West Africa supported by LWR, the mushroom cultivation in India by LWR, the biochar ecosystems project of CCDB and ICCO-Cooperation in Bangladesh, the women solar entrepreneurs in Tanzania supported by UMCOR, the EPFOSE project of The Salvation Army in Uganda, the small islands project of ICODE supported by Christian Aid in the Philippines, and the Soppexcca and

^{38.} R. Lal, "Sequestering carbon in soils of agro-ecosystems" in *Food Policy*, Volume 36, Supplement 1, January 2011, pp. S33-S39. Retrieved May 22, 2020 from https://reader.elsevier.com/reader/sd/pii/S0306919210001454? token=68120F2685AF94634C5BB0EFB119953933731A6E6D1D7931BE78F33A4AA8C5A442741523 EE210CDBC3A8C913ABA6780F.

Christian Aid sustainable cocoa production in Nicaragua all had net positive gains for the inclusion and participation of vulnerable indigenous peoples, women, and youth.

In all these, the projects respected the identity of the communities they worked with, as co-equals worthy of the well-being afforded to many others. Enhancing livelihoods allowed community-based partners of the projects to earn extra income to address food, education, and health needs of their households as well as enhance sources of income. This facilitates people developing confidence in themselves, empowers engagement, and enables people to earn recognition from their peers and partners. In the process, the persons, households, and communities assisted can live better lives and can better appreciate their rights and entitlements as human beings.

On getting these improvements counted

Across the ACT Alliance, it would be beneficial to have an interoperable data monitoring mechanism that could document how these efforts by marginalized and poor communities contribute to reaching Nationally Determined Contributions and Sustainable Development Goals, and as an aggregate amount contribute to the global effort at addressing climate change. While the projects have produced notable improvements at the community level and have high replicability, these may be used as more effective lobbying data to push for more ambitious government and private sector commitments if expressed in terms of climate mitigation achieved and climate mitigation potential.



Climate Justice and Livelihoods

ACT Alliance commits to climate justice and has been actively pursuing ways to realize its outcomes. Livelihoods can be a pathway to achieving this.

Justice is often associated with accountability, fairness, and equity. In climate justice, these associated concepts manifest in very specific forms. Accountability demands that those who are responsible for creating the anthropogenic hazard, in this case climate change, must be held accountable, own up to their responsibility over historical emissions, and aid those who suffer from the consequences of the climate change hazards. Fairness asks for the recognition and respect of every creation's and each human being's right to exist, live, survive, be resilient, and attain sustainability amid climate challenges. Equity requires that the needs of the more vulnerable should be given due attention first because their capacities to survive and thrive are more challenged due to their social, political, economic, cultural, and ecosystem contextual realities.

Can resilient, sustainable, low-carbon livelihoods facilitate climate justice? When livelihood prevents and avoids harm to others and when it makes amends for any harm caused, livelihood can be accountable. The cases presented illustrate attempts at ecosystem restoration where they have been degraded. When the livelihood considers the co-benefits to people's well-being, to the local economy, and to the environment in any intervention, fairness can unfold. Livelihood as a vehicle to climate justice uses stewardship as a means not only to sustain a living but also as a pathway for well-being respectful of the dignity and integrity of all creations. Such consciousness is aligned to low regrets approaches in sustainable development and akin to risk prevention or management for the purpose of developing resilient pathways. Lastly, livelihood can be equitable where there is a preferential option to enable the more vulnerable to cope, adapt, and thrive.

Climate justice and livelihoods in the time of a pandemic

In the midst of the COVID-19 crisis, the articulation of climate-resilient, sustainable, and low-carbon livelihoods as a pathway to climate justice will change. Accountability will not only demand support for low-carbon livelihoods but also require practices that reduce local transmission and vulnerability to SARS-COV-2 if we want to achieve resilience and sustainability. Fairness will require climate-resilient livelihoods that also respect health resilience for all, particularly within the entire value chain of each livelihood. Lastly, equity in climate-smart initiatives will require enabling the capacities of those who need help the most to find means to secure their own well-being as they work toward low-carbon, resilient, sustainable livelihoods.

5 Recommendations

ACT Alliance members have ongoing community-based livelihood work providing opportunities to mainstream low-carbon, resilient, sustainable livelihood approaches. The following points suggest measures for how the framework components can be mainstreamed in their current initiatives.

Collaboration

- It will benefit ACT Alliance and its members to collaborate with scientific or academic institutions for their climate initiatives. Institutions with knowledge on climate forecast applications can help inform agriculture, fisheries, and other livelihood sectors. And because climate change adaptation, resilience, mitigation, loss, and damage work specific to adaptation will need innovations, these institutions can help inform the work of ACT Alliance members.
- Many of the innovations that will be needed in livelihoods may challenge local resources. It will be best for members of ACT Alliance to learn how to engage non-traditional partners like the government, the private sector, and other stakeholders. Sustainable food production necessarily involves looking at sustainable food value chains and for that, establishing or influencing actors across the entire value chain would be crucial.

Informed decision-making

 Climate risk assessment that takes into consideration a systems thinking approach needs to be at the foundation of every livelihood intervention. Hazards will need to factor in natural and human-induced elements, including pandemics. For the climate element, climate forecasts and scenarios must be used as a reference for hazard assessment. Exposure analysis to potential hazards must be for human, ecosystems, and valuable assets relevant to each phase of a livelihood's value chain. Vulnerability assessment must include analyses of human (including health), social, physical, environmental, economic, and political/institutional sensitivity and susceptibility.

Appropriateness and timeliness of interventions

- Risks to livelihoods are always context specific. Thus, appropriate measures to ensure resiliency and sustainability of livelihoods need to be calibrated against potential risks. For instance, several types of crops grow at very specific weather conditions. Fishing is sensitive to marine heat waves and other atmospheric conditions. To secure sustainability of livelihoods, interventions will need to be cognizant of and sensitive to climate and other relevant conditions.
- Whereas farming can be done with the social distancing required for health resilience against a pandemic, fishing in deep sea can only be done with a specific crew that will have to negotiate the use of limited space in fishing vessels. Moreover, further down the value chain, current food and fish processing does not meet physical distancing requirements. Hence, context-specific innovations will be needed.

Maintaining and enhancing capabilities

- ACT Alliance members will also need to deepen understanding of the difference between risk prevention, preparedness, anticipation, resistance, absorption, coping, accommodation, adaptation, transformation, and recovery approaches when applied to livelihoods. This will sharpen skills on determining what types of interventions are appropriate for specific climate-related challenges and when these interventions can be applied.
- Investing in youth is always a good way forward. Intergenerational transfer of knowledge and capacities has been recognized as a means of sustaining subcultures and communities in different countries. This is a key feature amongst indigenous peoples' way of life that is slowly disappearing in many rural communities around the world.
- Building local expertise that facilitates community-managed livelihoods is a step forward from current community-based initiatives.

Use of low-carbon approaches and assets

- Where resources are available, ACT Alliance members can support community livelihoods so they
 can have renewable energy access. However, in some cases, the support infrastructure needed for a
 renewable energy shift may still be absent. ACT Alliance members and their partner communities can
 advocate for or participate in participatory planning and budgeting processes of government so that
 renewable energy access can become a priority in the governance processes.
- It is important to note that at the community level, the purpose and value of renewable energy access to mitigation and adaptation must be understood. For marginalized and vulnerable communities that are at risk to climate hazards, it will also be important to note what are the co-benefits of low-carbon approaches to adaptation. This awareness may also help them select appropriate low-carbon technologies that will help them reduce the impact of climate change hazards due to historical emissions. For instance, in urban contexts, a shift to renewable energy in livelihoods and industries will help reduce greenhouse gas emissions that may further influence climate hazards, such as urban heat.
- It will also be useful for ACT Alliance members to have very concrete recommendations for the inclusion of a shift to renewable energy-based community livelihoods and industries in the Nationally Determined Contributions of their respective countries.

Nature-based solutions

• At this critical juncture in human history, members of ACT Alliance must work toward coherence between its climate justice campaign and its adherence to stewardship and its choice of livelihood interventions to support, encourage, and enable. It will be important to make such a choice at the onset of a livelihood initiative. Where a livelihood investment is already ongoing, measures to incorporate ecosystem management or restoration can be built into an existing livelihood.

Social justice and equity

• The Climate Justice Framework of ACT Alliance gives its preferential option for those who are poor, marginalized, and most vulnerable. While doing so, any livelihood intervention must resist the temptation of facilitating dependencies instead of self-reliance. Thus, livelihood approaches must always be enabling and empowering so as not to enhance vulnerabilities and replicate or multiply

powerlessness. This same approach must be respected across the different phases of any livelihood value chain. ACT Alliance members can always review how project outputs are contributing to goals of social justice and equity. For instance, Alliance members can ask whether the poor, marginalized, and vulnerable they chose to serve really have gainful and meaningful return of investments at the end of a livelihood project. Did the livelihood intervention allow them to address their needs and enhance their well-being? For this, ACT Alliance members can use many tools; among them is the Most Significant Change tool.

It is recommended that the principles of low-carbon, resilient, sustainable livelihoods be mainstreamed in the existing livelihood work of ACT Alliance members rather than overhauling entire interventions. Mainstreaming is a cost-efficient approach that targets co-benefits and promotes deeper understanding of the principles for climate justice.

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