

Initiatives, projects or programmes provided by parties and observers of the Koronivia Joint Work on Agriculture, during the 2021 SB Sessions, from 1 to 17 June 2021. The initiatives, projects or programmes were provided as considered good examples of sustainable land and water management, including integrated watershed management strategies, to ensure food security in the context of climate change.

| Title of the initiative, project or programme                                                                                         | Outstanding features and/or outcomes of this particular initiative, project or programme                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Link to the website of the initiative, project or programme                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Institution that implemented the initiative, project or programme                                                                                                                                                                                                                                                   |
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| Silvopastoral Producers Association of Pedasí (APASPE), Los Santos Panama.                                                            | It is a project that started with funds from the Small Donations Program (PPD) -PNUD, these producers have continued to train and expand their knowledge to other producers in the region, a region that in past years had been widely affected by deforestation, problems land degradation. These new generations seek to raise awareness among children, youth and producers in general about conservation and about bringing a traditional livestock farming to be more environmentally friendly and sustainable. They have worked on the implementation of best practices such as silvopastoral systems, conservation of riverine sources and reforestation among other activities. The Environmental Leadership and Training Initiative (ELTI) continues to work with these producers and they are an example of how things can be improved in these production systems.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <a href="http://apaspe.santos.gub.gv.pa/">http://apaspe.santos.gub.gv.pa/</a><br><br><a href="https://books.google.com.pa/books?id=zNVsDQAAQBAJ&amp;pg=PA308&amp;lpg=PA308&amp;dq=APASPE&amp;source=bl&amp;ots=gLq9M0a7aN&amp;sig=ACfU3U0qP0sVIYQe6ytBN2sr7PcdYp7ecA&amp;hl=es-419&amp;sa=X&amp;ved=2ahUKewIM3r7V6p7xAhX0TDABHRL9B9wQ6AEwEnoECAYQAw#v=onepage&amp;q=APASPE&amp;f=false">https://books.google.com.pa/books?id=zNVsDQAAQBAJ&amp;pg=PA308&amp;lpg=PA308&amp;dq=APASPE&amp;source=bl&amp;ots=gLq9M0a7aN&amp;sig=ACfU3U0qP0sVIYQe6ytBN2sr7PcdYp7ecA&amp;hl=es-419&amp;sa=X&amp;ved=2ahUKewIM3r7V6p7xAhX0TDABHRL9B9wQ6AEwEnoECAYQAw#v=onepage&amp;q=APASPE&amp;f=false</a> | .                                                                                                                                                                                                                                                                                                                   |
| Center for Environmental Farming Systems Agroforestry and Silvopastoral research, and the related NC Choices Beginning Farmer Project | A network of related research projects through the Center for Environmental Farming Systems (CEFS) examine the potential for agroforestry and silvopastoral systems to restore marginal lands, improve resilience and ecosystem health, while increasing farmer revenue. Significant areas of marginal croplands are present throughout the southeastern USA. Silvopasture, which combines the ecological and production strengths of long-term woody biomass with similar strengths of herbaceous forages, is a potentially resource-efficient and flexible approach for marginal croplands. Research conducted by the USDA ARS ("Strategies to Support Resilient Agricultural Systems of the Southeastern U.S.") in partnership with local universities and others documents the feasibility of adopting silvopastoral and agroforestry on marginal lands. The related NC Choices Beginning Farmer Project, by the CEFS in partnership with North Carolina Extension Services, seeks to pair beginning farmers with landowners who have small wood lots, solar panel sites, or other marginal lands that may be suitable for pilots of agroforestry or silvopastoral practices including alley cropping. <a href="https://cefs.ncsu.edu/food-system-initiatives/nc-choices/ncc-beginning-farmer-project/">https://cefs.ncsu.edu/food-system-initiatives/nc-choices/ncc-beginning-farmer-project/</a> | <a href="https://cefs.ncsu.edu/silvopasture-integrating-agriculture-and-forestry/">https://cefs.ncsu.edu/silvopasture-integrating-agriculture-and-forestry/</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | The Center for Environmental Farming Systems is a partnership of North Carolina State University, North Carolina Agricultural and Technical State University, and the North Carolina Department of Agriculture and Consumer Services. Additional partners include USDA ARS and North Carolina Cooperative Extension |
| US Forest Service National Agroforestry Center (NAC)                                                                                  | The mission of the National Agroforestry Center (NAC) is to advance the health, diversity, and productivity of working landscapes, watersheds, and communities through agroforestry, and to "make trees outside the forest count." America's working lands — farms, ranches and forests — face increasing pressures to maximize production for a growing population while minimizing the impacts to wildlife, soils, water, and other ecosystem services on which we depend. Agroforestry — the intentional integration of agriculture and forestry — has tremendous potential to restore and enhance ecosystem services critical to meeting these needs. Agroforestry practices provide a wide range of production and conservation benefits, for example, windbreaks are designed to increase crop yields, reduce erosion, and improve soil health while also providing other conservation benefits like wildlife habitat. NAC conducts, synthesizes, and distills research; produces tools and information that support land management decision-making; and develops and delivers science-based agroforestry information to natural resource professionals working with farmers, ranchers, forest landowners, Tribes, and communities. This information is delivered through publications, workshops, training, and demonstration sites.                                                           | <a href="https://www.fs.usda.gov/nac/">https://www.fs.usda.gov/nac/</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Federal government (USDA U.S. Forest Service)                                                                                                                                                                                                                                                                       |

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| NRCS Conservation Stewardship Program (CSP), Conservation Reserve Program (CRP), and Environmental Quality Incentives Program (EQIP), Agricultural Management Assistance (AMA), Regional Conservation Partnership Program (RCPP), and others | The CSP, CRP, and EQIP provide financial and technical assistance to agricultural producers and non-industrial forest managers to address natural resource concerns and deliver integrated environmental benefits such as improved water and air quality, conserved ground and surface water, increased soil health and reduced soil erosion and sedimentation, improved or created wildlife habitat, and mitigation against drought and increasing weather volatility. These voluntary programs help producers make conservation work for them. These programs support food security by compensating farmers for production of environmental benefits, improving the economic viability of sustainable production and increasing rural incomes. Historically underserved (HU) participants are eligible for advance payments to help offset costs related to purchasing materials, adopting new practices, or contracting services through EQIP.                                                                                                                                                                                                                                                                                                                                                                                                       | <a href="https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/farmbill/">https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/farmbill/</a>       | Federal government (USDA) in partnership with sub-national government and producers                                                                                              |
| NRCS Landscape Conservation Initiatives (numerous)                                                                                                                                                                                           | NRCS uses Landscape Conservation Initiatives to accelerate the benefits of voluntary conservation programs, such as cleaner water and air, healthier soil and enhanced wildlife habitat. NRCS conservation programs help agricultural producers improve the environment while maintaining a vibrant agricultural sector. These initiatives build on locally led efforts and partnerships, including with Tribal governments, and improve the socioeconomic sustainability of producers while incentivizing nationally and regionally important conservation goals that transcend localities. These initiatives bring together integrated partnerships, targeted funding, locally-tailored tools, and community ownership of process to deliver meaningful conservation outcomes through voluntary action.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <a href="https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/initiatives/">https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/initiatives/</a> | Varies by initiative, usually a mix of producers, ranchers, federal, state, local and tribal government agencies, universities, non-profit groups, civil society and businesses. |
| Long-Term Agroecosystem Research (LTAR) Network                                                                                                                                                                                              | To address escalating need for productivity and efficiency for food security while improving stewardship of natural resources (including land and water), the USDA launched the LTAR, which comprises 18 agricultural research sites across the United States, spanning geographic and climatic gradients, and most agroecosystems in the U.S., working together to advance the sustainable intensification of U.S. agriculture. Growing global population and changing diets, combined with a greater societal awareness of agriculture's role in delivering ecosystem services beyond food, feed, fiber, and energy production, require a comprehensive perspective on where and how U.S. agriculture can be intensified sustainably. The LTAR integrates question-driven research with common measurements on multiple agroecosystems (croplands, rangelands, and pasturelands) and develops new management tools and technologies to address agricultural challenges and opportunities. In addition, the LTAR provides common measurements and data streams that complement other federally-funded national networks, such as the National Ecological Observatory Network (NEON) and the Long Term Ecological Research (LTER) network. The LTAR also engages with producers, policy makers, and stakeholders via outreach and education strategies. | <a href="https://ltar.ars.usda.gov/">https://ltar.ars.usda.gov/</a>                                                                                                       | USDA/ARS in coordination with public agriculture universities, producers, sub-national government and other stakeholders                                                         |

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| USDA ARS Dale Bumpers Small Farms Research Center                                                                                                                          | Dale Bumpers Small Farms Research Center conducts research to introduce new practices and technologies to help small farms become more profitable and sustainable, including through integrated systems such as agroforestry and silvopastoralism. This includes dedicated research on the integration of small farms within the landscape for watershed management; this watershed project is studying different management practices on forages, soils and water. Related research seeks to develop agroforestry strategies that can be successfully integrated into small farm production systems to optimize the economic viability, social equity, and environmental protection of these multifunctional working landscapes. In addition to diverse research on many elements of sustainable production from small farms, Dale Bumpers conducts economic analysis on aspects of the socioeconomic viability of small farms, which are essential to the livelihoods of rural communities, and their access to local fresh food.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <a href="https://www.ars.usda.gov/southeast-area/booneville-ar/dale-bumpers-small-farms-research-center">https://www.ars.usda.gov/southeast-area/booneville-ar/dale-bumpers-small-farms-research-center</a>                                                                                                                                                                                                                       | Partnership between ARS and NIFA Researchers, University of Arkansas, University of Missouri, University of Tennessee, and local producers. |
| Strengthening the resilience of smallholder farmers in the Dry Zone to climate variability and extreme events through an integrated approach to water management           | Village irrigation schemes have been damaged through flooding, siltation, and the impact of extreme weather events, which also threaten safe drinking water access. Irrigation will be improved in the Northern and Eastern Provinces through investing in improving the community irrigation water infrastructure, scaling-up decentralized drinking water systems, and strengthening early weather warnings, flood-response, and water management.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <a href="https://www.greenclimate.fund/project/fp016#overview">https://www.greenclimate.fund/project/fp016#overview</a>                                                                                                                                                                                                                                                                                                           | Green Climate Fund (GCF) Project                                                                                                            |
| Building adaptive capacity through food and nutrition security and peacebuilding actions in vulnerable Afro and indigenous communities in the Colombia-Ecuador border area | The project aims to strengthen food security and nutrition through climate change adaptation measures in two binational watersheds – the Guaitara-Carchi and the Mira-Mataje, which encompass the area's coastal mangroves and inland dry and humid forest systems. All the activities have been designed through a participatory approach with targeted communities in order to integrate traditional knowledge, reintroduce native species, conserve soils, access clean water and recover degraded ecosystems for the 120 communities of focus. The project is the first initiative in Colombia and Ecuador to use traditional knowledge from Afro and Awá communities for environmental conservation and adaptation planning. Engaging Awá and Afro organizations as Executing Entities strengthened relationships with the targeted communities and facilitated access to information for the development of studies the implementation of activities in the area of intervention. The project seeks to improve soil quality through the introduction and recovery of vegetation cover and use of good agricultural practices, to mitigate impacts of heavy rains in areas highly affected by erosion and drought. Sub-activities include vegetative recovery of affected soils, wind breaks terraces, bunds and retention structures, introduction of agroforestry and silvopastoral systems, family gardens and introduction of organic products. It is also implementing water storage, capture and harvesting systems to increase water availability for agricultural use. Interventions for water storage include community water reservoirs and fog catchers. By the end of the project at least 3,000 ha degraded land will be recovered using agroforestry and nitrogen fixing species. The project presents an important opportunity to integrate climate change adaptation in Afro and indigenous development plans (Life Plans and Local Governance Plans) and binational watershed management plans, contributing to local economic development in historically marginalized areas. The project is fostering community involvement and local ownership of project | <a href="https://www.adaptation-fund.org/project/building-adaptive-capacity-climate-change-food-security-nutrition-actions-vulnerable-afro-indigenous-communities-colombia-ecuador-border-area-colombia-ecuador-2/">https://www.adaptation-fund.org/project/building-adaptive-capacity-climate-change-food-security-nutrition-actions-vulnerable-afro-indigenous-communities-colombia-ecuador-border-area-colombia-ecuador-2/</a> | Implementing Entity: UN World Food Programme; Executing Entity: Corponariño, Gran Familia del Pueblo Awá Binaciona                          |

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|                                                                                 | activities through Seasonal Livelihood Programming (SLP) workshops and studies to recover native species and recruited local executing partners, including the Grand Family Awá, the Network of Southern Pacific Community Councils (RECOMPAS) and the Afro-Ecuadorian Confederation of Northern Esmeraldas (CANE), to co-design locally driven plans and execution.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                  |
| Building Resilient Food Security Systems to Benefit the Southern Egypt Region   | The project's goal was to build resilience of Southern Egypt farming communities in the face of climate change and variability risks to food security. The project employed an integrated package of Sustainable Land Management (SLM) interventions and water saving irrigation methods to build resilience in agricultural production of smallholder farmers. Land consolidation removed barriers between fragmented land plots, increasing land available for cultivation by 20- 25%. Approaches employed by the project such as multi-cropping and intercropping helped farmers economize the use of water, fertilizer, and pesticides, thus reducing the negative impacts of their activities on the environment. Without the project, farmers were over-exploiting water and increasing fertilizer usage to enhance productivity. The project's use of heat tolerant varieties, changes in sowing dates, reduced climate-induced productivity losses, also reducing unsustainable practices where a 25-30% reduction in fertilizer and water usage was recorded. Likewise, irrigation rescheduling and canal lining were recorded to induce a 25-30% reduction in water usage. The 'Building Resilient Food Security Systems to Benefit the Southern Egypt Region' project proved to be a highly successful model for the support of vulnerable villages in Upper Egypt. Building on the success of the project 'Building Resilient Food Security Systems to Benefit the Southern Egypt Region', the project was scaled up with additional funding from the AF 'Building Resilient Food Security Systems to Benefit the Southern Egypt Region- Phase 2' and will further extend climate resilience among vulnerable smallholders' communities in the region. In this regard it will replicate interventions that have proven successful in building climate resilience in 15 new villages throughout the Governorates of 11 Southern Egypt, namely Assuit, Sohag, Qena, Luxor and Aswan. | <a href="https://www.adaptation-fund.org/project/building-resilient-food-security-systems-to-benefit-the-southern-egypt-region/">https://www.adaptation-fund.org/project/building-resilient-food-security-systems-to-benefit-the-southern-egypt-region/</a> and <a href="https://www.adaptation-fund.org/project/building-resilient-food-security-systems-to-benefit-the-southern-egypt-region-phase-2-2/">https://www.adaptation-fund.org/project/building-resilient-food-security-systems-to-benefit-the-southern-egypt-region-phase-2-2/</a> | Implementing Entity: UN World Food Programme; Executing Entity: Ministry of Agriculture, Ministry of Environment |
| Conservation Effects Assessment Project (CEAP) Watershed Assessment Study (WAS) | CEAP is a large scale research-to-action project, its goal is to provide the American people better understanding of the role agricultural conservation practices and programs play in achieving the nation's environmental objectives - clean air and water, healthy soils, and functioning habitat for wildlife. Improved understanding of the performance of integrated land and water conservation at varying scales also informs investment in future projects and new practices, and design of policy-planning tools to optimize profits, environmental quality, and conservation practice efficiency. CEAP works across 14 diverse watersheds nationwide. The initial effort focused on croplands, with grazing lands and wetlands being added in 2007.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <a href="https://www.ars.usda.gov/anrds/ceap/ceap-home/">https://www.ars.usda.gov/anrds/ceap/ceap-home/</a>                                                                                                                                                                                                                                                                                                                                                                                                                                     | USDA's Natural Resource Conservation Service and Agriculture Research Service                                    |
| Food Policy for Canada                                                          | While not speaking specifically to "sustainable land and water management to ensure food security in the context of climate change", the following initiative does allude to it, and complements the policy framework already mentioned. As of 2019, Canada also has an overarching national-level Food Policy, which includes six long-term interconnected and mutually-reinforcing outcomes, identified to support better long-term planning for the Canadian food system. These are as follows: Vibrant communities; Increased connections within food systems; Improved food-related health outcomes; Strong Indigenous food systems; Sustainable food practices; and Inclusive economic growth. When the Food Policy for Canada was launched, four significant areas within food systems were identified as requiring action in the short- and medium-term to support long-term outcomes. These initial actions reflected the most pressing needs and priorities for the first five years (2019-2024), and included working to reduce food waste throughout the food system, and addressing food insecurity across Canada and with specific initiatives focused on supporting Canada's Northern and Indigenous communities.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <a href="https://www.agr.gc.ca/eng/about-our-department/key-departmental-initiatives/food-policy/the-food-policy-for-canada/?id=1597863791042">https://www.agr.gc.ca/eng/about-our-department/key-departmental-initiatives/food-policy/the-food-policy-for-canada/?id=1597863791042</a>                                                                                                                                                                                                                                                         | .                                                                                                                |

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| Desarrollo Alternativo E Investigación A.C | <p>Desarrollo Alternativo E Investigación A.C has an innovative approach to ensuring food security and increasing the adoption of sustainable agricultural practices in Chiapas, Mexico. Their program has reduced the use of synthetic fertilizers and contributes to climate adaptation and mitigation. The state of Chiapas is one of the most important agrobiodiversity spots of the world. However, over several decades of local governments and companies providing (often as a “gift”) conventional seeds and agrochemical packages to smallholder farmers, this activity is dramatically reducing plant diversity with negative consequences on human and environmental health. Consequently, it is also distorting social organizations and local economy with negative impacts to smallholders’ livelihoods. DAI’s Participatory Seed Dissemination process increased local maize and beans yields by at least 10% by seed selection practices, farming diversification and family income in 1,500 families in Chiapas by adopting new soil management techniques and increased the number of species managed in the plots. The process can be described in two phases; first, in 2003-2006 a Participatory Plant Breeding process with 220 farmers of 20 municipalities in 5 indigenous regions of Chiapas began, 300 Maize seed varieties were collected. The seeds were sown and farmers were invited to choose at least 5 different types of maize and beans (Diversity Seed Fairs). Farmers took home selected seed varieties and organized their own trials. They intensified experimentation process and results were exchanged with others. Organizations and farmers formed the Red Maíz Criollo; an actor that was key to leading planning, organizing and, evaluating Participatory Plant Breeding process in the region. Red Maíz Criollo became into a platform for strengthening local varieties and supply seeds all over the Chiapas State during the following years. In a second phase (2009-2012) we decided to expand the process to a critical mass of smallholders by involving 11 new R&amp;D organizations. 75 champions farmers were trained as Agrobiodiversity Pollinators. In practice they collected, organized diversity seed fairs and farmers’ trials network but also a portfolio of agro-ecological practices which they diffused.</p> | <a href="https://solutionsearch.org/contests/entry/465">https://solutionsearch.org/contests/entry/465</a>   | <p>The DAI team, who are all local residents of Chiapas, lead this program. They collaborate with many stakeholders including</p> <ul style="list-style-type: none"> <li>• NGOs: Colectivo ISITAME A.C., CICERP A.C., Union de Milperos Tradicionales A.C. Red de Maíz Criollo</li> <li>• Research and development organizations: Programa Modernización Sustentable de la Agricultura Tradicional (MasAgro), Universidad Autónoma de Chiapas (UNACH) o Universidad Intercultural de Chiapas (UNICH), Comisión Nacional de Áreas Naturales Protegidas (CONANP), National institute of Agricultural Sciences (INCA), International Centre for development oriented Research in Agriculture (ICRA), Secretaría del Campo (SECAM), Secretaría de Pueblos Indios (SEPI)</li> </ul> <p>At least 500 clients from Larrainzar, Zinacantan, Tenejapa y Chenalhó municipalities were involved as well and the accessed to local seed varieties improved by reaching small-holder farmers.</p> |
| Wetlands Work Limited (WW)                 | <p>Wetlands Work Limited (WW) provides low maintenance wastewater treatment solutions using natural microbial processes to improve human health and aquatic ecosystems, create new local jobs and use fecal waste as a soil supplement. WW focuses on sanitation in challenging environments where pit latrines and septic tanks are inappropriate. Previously, houses literally float in black, odorous septic water while neighborhood poop floats by their porch. In floating and floodplain villages there’s never been an appropriate alternative to open water defecation. The wastewater treatment solution HandyPod, is a 3-container anaerobic microbial biofilm treatment system installed near water level on the side of a floating house. It can also be installed on land-based houses. This system has not only cleaned up the water surrounding these villages but has also led to more productive community fisheries in the surrounding area.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <a href="https://solutionsearch.org/contests/entry/1024">https://solutionsearch.org/contests/entry/1024</a> | <p>This solution was created by Wetlands Work Limited, a social enterprise that designs and builds innovative treatment systems and promotes awareness of wetland values in rural villages in Cambodia. Tonle Sap Lake’s sanitation challenge was identified in 2009 when WW Director Taber Hand began working for Conservation International as freshwater programs advisor. Dr. Hand’s 35-year background of wetland science and management initiated the process to reach an iterative HandyPod technical solution. WW’s creative treatment solutions have started from Taber’s experience. Numerous graduate interns- both national and international, fellowships, and</p>                                                                                                                                                                                                                                                                                                      |

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| 丽江健康与环境研究中心 - Lijiang Health And Environmental Research Center | <p>Lijiang Health And Environmental Research Center motivates the aboriginal community of the Lisu people in Liguang Village to reduce dumping of garbage into the local river, thereby improving water quality and protecting fisheries. Under the influence of modernization, the aboriginal community of the Lisu people in Liguang Village has undergone changes in their production and lifestyles, which have caused river pollution. By stimulating the endogenous motivation of the villagers in the community, the project has condensed the homeland consciousness of the villagers in the community, promoted the autonomous governance of the community based on its own culture, society and ability foundation, formulated the village regulations and villager conventions, which effectively changed the villagers' behavior such as dumping domestic garbage into the river and the wanton use of chemical reagents when catching fishes, gradually solved the pollution problem of rivers and restored and proliferated fish resources that are almost extinct. In addition, the community used the project funds to establish a community mutual aid fund to provide financial support for the improvement of villagers' livelihoods, promoted the free development of villagers, and strengthened community unity. The gradual improvement of the Lisu nationality community in the above-mentioned social, economic and environmental aspects has effectively promoted its own sustainable development. Lijiang Health And Environmental Research Center organized villagers to go out for exchanges, learn from the experiences and lessons of villagers in other areas to protect their homes and the environment, and ask the villagers what they feel and think during the exchange. Villagers would gradually reflect on themselves: "If others can protect their homes, can't we?" In addition, the team would look for the leader of the Lisu nationality in Liguang Village, who had a high homeland consciousness and would continue to convey to the tribe people the demand and expectation of "protecting their homeland". Through this project presentation and community work, 12 villager groups, equalling to nearly 300 households, consisting of about 1,300 people in Liguang Village have adopted the expected plans and behaviors in the four years from 2015 to 2018. The community discussed village rules and villager conventions for river protection through village meetings. The village rules and villager conventions stipulate that villagers shall not dump domestic garbage in the river, and at the same time prohibit the use of chemical reagents to poison fishes and other activities that affect the water quality of the river. There are paper documents for all the village rules and villager conventions of the 12 villager groups, and have been signed by the villagers. At present, the rivers in Liguang Village are basically free of garbage, and the water quality is good. The indigenous fish that were almost extinct before have gradually been restored and can be seen everywhere. In addition, in the face of interference and destruction by people outside the community, such as fishing and poisoning fish, Liguang villagers can unite and punish outsiders who violate them, jointly defend the effectiveness of village rules and villager conventions, and safeguard the results of independent governance. The above behavioral changes come from our observations and witnesses in community work.</p> | <a href="https://solutionsearch.org/contests/entry/999">https://solutionsearch.org/contests/entry/999</a>   | <p>The dominant power of this project were community villagers. We believed that the villagers were the masters of the community, and the community should manage the community's public affairs and protect the river. If the work of protecting the river was led by us, it would not be able to effectively promote the collective actions of the villagers. In addition, the villagers would think that protecting the river was the job of the public welfare organization, not their own business. This would greatly reduce the effectiveness of the work of protecting rivers, and even cause conflicts and disputes. Only when the villagers formulate their own systems for self-management, can river pollution control be effectively implemented. Key figures, such as the director of the village committee, the leader of the Lisu nationality, and the leader of the village group, played a central role. These key figures contact government authorities, public welfare organizations, and ordinary villagers in the community, coordinate the interests of all parties, and strive for external resources to serve the community villagers.</p> |
| Instituto de Montaña                                           | <p>Instituto de Montaña improves water management and reduces acid rock drainage from mine tailing sites through low-cost artificial sedimentation and wetlands in Peru. In highland Peru, mine tailing sites are contaminating freshwater sources with acid rock drainage (ARD) and metals. This pollution affects irrigation systems, crops and human health. The regression of glaciers due to climate change worsens the issue. Mountain communities have low trust on information about environmental problems coming from outside sources. Instituto de Montaña devised a solution with intense involvement of the communities. The community has since installed low-cost bio-</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <a href="https://solutionsearch.org/contests/entry/1047">https://solutionsearch.org/contests/entry/1047</a> | <p>Instituto De Montaña implemented this program in mountain communities in Peru. Instituto De Montaña is an Environmental Nonprofit based in Peru that aims to support men and women in mountain communities to create and maintain</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

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|                     | <p>remediation system using simple techniques to sediment water and capture metals in artificial wetlands. The wetland uses local materials: one layer of coarse gravel, followed by sand, and then organic matter, native <i>Juncus</i> spp and sulphate-reducing bacteria grown and provided by the local university. This technical solution designed by local researchers was a low-cost artificial sedimentation and artificial wetlands that quickly improves pH reducing the level of metals in water.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                             | <p>sustainable economies, ecosystem conservation, research and innovation, founded on their own cultures and spirituality. The local research committee, a group of eight men and women volunteers who are members of the community lead the initiative.</p>                                                                                                                                                                                                                                                                                                                                                   |
| A Growing Culture   | <p>A Growing Culture (AGC) in partnership with a local farming community in Hanoi, Vietnam are transforming the negative aspects of hog farming and creating positive outcomes that benefit livestock, the community, and the environment. The development of “Living Bio-Beds” inoculated with local organisms and lactobacillus creates healthy hog bedding that actively breaks down hog waste and eliminates runoff and pollution into waterways. The living bio-bed uses a unique process that involves the burying of canisters of rice in different microclimates around a farm. After 10 days, a farmer returns to collect the top layer of mold that has grown. Next, the top layer of mold is mixed with warm water, molasses, and Lactobacillus (a culture from milk) and sprayed on the three layer hog bedding that is made of locally-purchased absorbent materials such as bamboo powder, sawdust, rice hulls, and dry leaves. The bedding becomes ‘alive’ and breaks down the manure and pig urine therefore eliminating all odor and runoff. These living beds challenge the approach of waste management from one based on disinfection to one that promotes co-infection. As a result, communities are protected and farmers raise healthier pigs that require less antibiotics and fetch higher market prices. Furthermore, when the hog bedding is changed it provides a highly valuable organic soil amendment that further reduces the use of costly and dangerous synthetic inputs and protects the environment in the process. The process of creating a living bio-bed is easily transferable and ready to be scaled up. Social and economic benefits are also realized in the community. The ability of these beds to break down hog waste eliminates runoff, effectively protecting the community from the toxic waste associated with industrial hog farms. Moreover the local economy is stimulated through the purchase of the absorbent materials needed for the hog beds. When AGC realized that much of the living bed technique was transferable, meaning easily adapted for other types of farming, they began working with local farmers to develop appropriate, ecological, and affordable technologies for improving their systems.</p> | <a href="https://solutionsearch.org/contests/entry/412">https://solutionsearch.org/contests/entry/412</a>   | <p>This program was implemented and developed by the team at A Growing Culture in collaboration with 4 expert farmers in Hanoi, Vietnam. Ms. Pham Nhu Trang, Ms. Hue, Mr. Thuan, and Mr. Viet all played a key role in lending their knowledge and testing the living bio-beds on their farms. Each of these farmers had concerns about the effects of toxic runoff from hog farms and wanted to contribute to making their operations more ecologically sound. More information about the implementers can be found here: <a href="https://www.agrowingculture.org/">https://www.agrowingculture.org/</a></p> |
| SwitchON Foundation | <p>SwitchON Foundation’s initiative is a good example for improving land and water management as it promotes the conservation of water quality in smallholding farms through 100% elimination of synthetic chemical inputs (fertilizers and pesticides). The elimination of synthetic chemical inputs not only minimizes and reduces the contamination of groundwater, but also reduces the chances of marine pollution and the impacts of ocean acidification. After continuous practise of organic agriculture, they have not only experienced improved groundwater and surface water purity, but also good soil health, local biodiversity and a two-fold rise in income. Today, we have an organized group of registered organic farmers working in a cluster. Through the years, we were able to increase number of farmers, increase land holding capacity and provide a better livelihood to the farmers.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <a href="https://solutionsearch.org/contests/entry/1027">https://solutionsearch.org/contests/entry/1027</a> | <p>Environment Conservation Society (SwitchOn Foundation) works towards equitable and sustainable development, implemented this program in West Bengal India. SwitchOn is headed by a woman entrepreneur and some very enthusiastic, young and optimistic individuals. Ekta Jaju is the co-founder of SwitchON Foundation and Founder CEO at Organic Foods. She has strong experience in the areas of Sustainable Energy and Agriculture, and consulted with several national and international organisations including UN Women</p>                                                                           |

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| The Canadian Agricultural Partnership | <p>In Canada, agriculture (and food) is an area of shared Constitutional jurisdiction between the federal/national-level government, and the governments of Canada's provinces and territories. Therefore, the approach since 2003, in order to ensure policy coordination, transparency, and fair funding support, is that the federal government and the provinces and territories negotiate and agree to successive five-year agricultural policy frameworks. Each framework outlines the mutual priorities for the sector, for the five years, as well as the investment in science and research, innovation, business risk management, sector competitiveness, and environment and climate change-oriented activities. There are federal-only programs, as well as provincial-only programs, under the framework, but the rest of the programming—including environment and climate change programming—is co-funded but designed and delivered by the provinces and territories, tailored specifically to their respective contexts (e.g., varied geography, varied types of production, varied processing capacity) and, as applicable, environmental priorities. The two key aspects of the environment and climate change programming are the Environmental Farm Plan (or equivalent environmental risk assessment and planning tool), and cost-shared funding support for farmers or food processors to adopt environmentally-beneficial management practices. The five-year policy frameworks do not preclude additional federal or provincial/territorial investments for the sector; however, they are the main agriculture and agri-food policy and programming vehicle for the country. The current framework (2018-2023) is called the Canadian Agricultural Partnership.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <a href="https://www.agr.gc.ca/eng/about-our-department/key-departmental-initiatives/canadian-agricultural-partnership/?id=1461767369849">https://www.agr.gc.ca/eng/about-our-department/key-departmental-initiatives/canadian-agricultural-partnership/?id=1461767369849</a> | Provincial and territorial governments, and third-party delivery agents                                                                                                                                                                                                                                                                                                                                                                                        |
| Manor House Agricultural Centre       | <p>Manor House Agricultural Centre uses Biointensive Agriculture (BIA) to counter food insecurity and soil degradation resulting from climate change and conventional agricultural practices. This solution produces 2-4 times more food, improves nutrition, promotes biodiversity and conserves environment by limiting greenhouse gases. Through practices like composting planting trees, biointensive agriculture removes carbon from the atmosphere and puts it back in the soil, ensuring sustainable use of natural resources. Manor House Agricultural Centre offers biointensive agriculture training, research and extension services. They test ecological solutions on both farms and their own research station, and have successfully completed a five-year project developing conservation agriculture production systems, which restore soil health and create more resilient fields through crop diversification, use of permanent ground cover, and minimization of tillage. Other components of their trainings include: 1.Composting organic matter to improve soil fertility 2.Deep soil preparation to enhance growth 3.Companion planting to optimize yields 4.Mulching to conserve soil moisture 5.Close spacing to increase productivity 6.Non chemical pest and disease control to produce safe food 7.Open pollinated seeds to conserve genetic diversity 8.Carbon and calorie farming in specific proportions to produce food and biomass for composting i.e. food crops removing CO2 from the atmosphere and fixing it in soil 9. A whole gardening System, all components used together to maximize benefits. BIA training is conducted practically in our demonstration gardens on station and on farms. Trained farmers train others and we provide technical support through follow ups to enhance adoption of best practices. The result is biodiversity in food crops, soil flora and fauna, reduced farming risks and increased awareness on environment conservation. Trees are planted in every rain season. We sustain high yields from diverse crops providing a balanced diet for our trainees. In outreach, students and teachers of 2 schools have been trained in BIA and demo sites established for sustainable land use in the schools. Key success factors included that BIA is simply done by hand, is cheap, produces 2-4 times more on</p> | <a href="https://solutionsearch.org/contests/entry/390">https://solutionsearch.org/contests/entry/390</a>                                                                                                                                                                     | Since its founding in 1984, Manor House Agricultural Centre has provided training and certification in sustainable agriculture, organic farming methods, and ecological farm systems for small-scale farmers at our Kitale, Kenya, campus. Manor House Agricultural Centre is a member organization of PELUM-Kenya, a network of 49 civil society organizations. They conduct training workshops for staff and farmers of member organizations of PELUM-Kenya. |

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|                                                                                                                                                   | small land sizes & it's practicable in all ecological zones, is not based on expensive commercial inputs & so suits resource poor farmers. Awareness to shun conventional farming has increased paving way for organic farming.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| • Investigation of Rains and Streams in the Erzurum-Aziziye-Sinirbaşı River Basin                                                                 | The aim of the study is to measure and optimize precipitation and currents in order to provide a water budget for sustainable agricultural activities in agricultural areas. The precipitation trend of the basin was determined by making measurements over a 25-year period. Depending on the climate change of the basin, changes in the water budget have been determined.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <a href="https://www.tarimorman.gov.tr/TAGEM/Menu/27/Proje-Degerlendirme-Toplantilari">https://www.tarimorman.gov.tr/TAGEM/Menu/27/Proje-Degerlendirme-Toplantilari</a> | research institute and other related institutions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| • Determining the Effects of Land Degradation Trends on Land Productivity Dynamics                                                                | With this study; effects of temporal and spatial changes of land use patterns will be investigated on land productivity dynamics by the way of physical, chemical and biological land/soil degradation in the selected region containing different land uses (forest, pasture and agricultural area) at Tekkeköy district of Samsun province at watershed scale. The relationships between severity of land degradation and soil ecosystem will be addressed through land use changes, NDVI, physical, chemical and biological soil analysis using updated and archive satellite images with high resolution in the selected region. Understanding of the relationships between land/soil degradation (and restoration), soil biodiversity and soil functions has a great importance regarding application of land management, policy planning and prioritization.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <a href="https://www.tarimorman.gov.tr/TAGEM/Menu/27/Proje-Degerlendirme-Toplantilari">https://www.tarimorman.gov.tr/TAGEM/Menu/27/Proje-Degerlendirme-Toplantilari</a> | local institutions and research institute                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| • Sustainable Land Management in Arid and Semi-Arid Areas: Determining the Impact of Climate and Land Use/Cover Change on Land Degradation        | Türkiye Degradation of agricultural areas causes decrease of carbon stocks in soil and vegetation especially in arid areas. The project will determine the effects land use/cover changes on land degradation and land productivity dynamic in the Mogan Catchment for a period of 20 years. Land productivity dynamics (LPD) in the basin will be monitored in order to determine the spatial variation by creating a basin-specific LPD map. Past and present-day data will be compared to determine the change of carbon budget resulting from land use/land cover change and improper agricultural practices in the catchment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <a href="https://www.tarimorman.gov.tr/TAGEM/Menu/27/Proje-Degerlendirme-Toplantilari">https://www.tarimorman.gov.tr/TAGEM/Menu/27/Proje-Degerlendirme-Toplantilari</a> | government institutions and farmers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Pathways of scaling agricultural innovations for sustainable intensification in the polders of coastal Bangladesh (SIIL-Polder Project: phase II) | Bangladesh has achieved self sufficiency in rice using green revolution technologies. But with a population of 160 million that continues to grow at 1.2% annually, the country faces enormous challenges to maintain food self-sufficiency. In addition to its increasing population, rapid urbanization is fast reducing the share of cropland every year. There is little scope to further increase food production, except on the underutilized coastal zone lands, especially 1.2 million hectares of arable lands in the polders of the coastal zone of Bangladesh. The polders are home to approximately eight million poor people, mostly smallholder farmers, landless farm laborers, women, and children. The agricultural environment in the coastal zone is generally termed as "high risk to climate change" and most farmers adopt "low investment" risk aversion strategy and ultimately get "less production." The SIIL-Polder project aims to improve food security, human nutrition, and livelihoods of the rural polder communities in southern Bangladesh. This will be achieved through the scaling and evaluation of pragmatic and feasible farming approaches for more efficient utilization of available resources to sustainably intensify agricultural productivity in the polders. With climate change, the region is one of the hotspots for flooding in the wet season and salinity intrusion in the dry season. Since the hydrology of the coastal zone is different from other parts of Bangladesh and is mainly governed by the lunar tidal phenomenon, it is practically | <a href="https://www.irri.org/siil-polder#our-work">https://www.irri.org/siil-polder#our-work</a>                                                                       | Since 2015, Kansas State University (KSU) and International Rice Research Institute (IRRI), in collaboration with Sustainable Intensification Innovation Lab (SIIL), a Feed the Future (FtF) USAID-funded program and other national research and development agencies have been working on the SIIL-Polder project. The project is collaborating with the Department of Agricultural Extension, Institute of Water Modelling, national NGOs (BRAC, Shushilan), and local universities (Bangladesh Agricultural University, Khulna University, Sher-e-Bangla Agricultural University, and |

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|                                                                                    | <p>impossible for an individual farmer in this zone to adopt agricultural innovations managing large volumes of tidal river water. Such hydrology demands community-led water management for wide-scale adoption, one of the key focuses of the project for improving agricultural technologies adoption for higher productivity and improved livelihoods. Key achievements (so far) a. Developed two most productive, profitable and resilient cropping patterns through an innovative community-led water management matching with the polder agro-hydrology with 2-3 times higher productivity than the farmers' cropping practices. b. Developed women entrepreneurs in agricultural mechanization; the landless poor who used to harvest paddy manually providing services to the community harvesting paddy by reaper and leading improved livelihoods with higher (USD 392-503 per year) income than before (USD 45-114 per year). c. Capacity building of about 7000 farming community (~50% women) and 14 new generation scientists and professionals (36% women) on different aspects of crop and water management under polder environment, marketing and trade-off among new crops and cropping systems with the traditional cropping; they are expected to contribute future challenges in food and nutritional security of the coastal zone communities of Bangladesh. d. Introduction of bio-fortified zinc rice, sunflower and maize is expected to improve household nutrition. Sunflower, as a dry season crop, gained popularity not only for its resilience but also its high acceptance as edible oil from its own farm. The community used maize grains and leaves as the feed for their poultry, livestock and fish via which the household had more access to milk, meat, egg and fish that is expected to improve nutrition of the polder communities. e. The learning hub model could be an appropriate agricultural technology dissemination model for cropping intensification in the polders of the coastal zone of Bangladesh.</p> |                                                                                                                                                                         | <p>Patuakhali Science and Technology University). The project is also leveraging partnership with other national agencies (Bangladesh Water Development Board, Bangladesh Rice Research Institute, Bangladesh Institute of Nuclear Agriculture, Bangladesh Agricultural Research Institute, Bangladesh Livestock Research Institute) and international agencies (International Maize and Wheat Improvement Center.)</p> |
| Fire-free Rice and Wheat Cultivation in Punjab, India                              | <p>Burning of especially rice, as well as wheat straw over many years has caused the soils of Punjab to degrade and erode, as well as causing severe air pollution and black carbon emissions that impact Delhi and the nearby Himalayas snowpack. This project provided both international and state-level support to several large villages in support of use of equipment that cut and spread the straw on soils, where it could be incorporated. This increased soil organic matter, making it more fertile and water-retentive, decreasing fertilizer and irrigation use. Key to this project was 24/7 equipment support for the "Happy Seeder", and follow-on satellite monitoring has confirmed that almost no farmers in these villages burned, even during the Covid-19 pandemic when use of fire otherwise rose needs and e essenti</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <a href="https://openburning.org/demonstration-projects/himalayas/himalayas-overview/">https://openburning.org/demonstration-projects/himalayas/himalayas-overview/</a> | <p>Punjab Agricultural and Management and Extension Training Institute (PAMETI), ICCI (international experts and support), Miami University (satellite monitoring), FAO, UNEP</p>                                                                                                                                                                                                                                       |
| Fire-free Conservation Agriculture in Agricultural "Comunidades" in Huancayo, Peru | <p>Demonstration project conducted 2016-18 that provided training in no-burn agricultural methods among small mountain shareholders in Huancayo province. Farmers found these methods improved yields of staple crops (maize and peas), while building up soil and decreasing water needs through better retention. No-till equipment was transferred to the "comunidades" at end of project, and neighboring regions have requested similar programs.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <a href="https://openburning.org/demonstration-projects/andes/">https://openburning.org/demonstration-projects/andes/</a>                                               | <p>ICCI, CARE-Peru, INIA Huancayo, Miami University (U.S.)</p>                                                                                                                                                                                                                                                                                                                                                          |
| Addressing Agricultural Burning in Russia to Increase Food Security and Resilience | <p>This 2011-14 project provided training, including workshops, Field Days for farmers, and study tours to Sweden and the U.S., on fire-free methods to large commercial farms in three Russia oblasts. Not only have especially those farmers participating in study tours continued to apply these no-burn methods; they have organized their own trainings and study tours (including to find the latest equipment) to spread this knowledge in local networks.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <a href="https://openburning.org/demonstration-projects/eastern-europe">https://openburning.org/demonstration-projects/eastern-europe</a>                               | <p>ICCI, Bellona-Russia, local soils institutes and farming organizations</p>                                                                                                                                                                                                                                                                                                                                           |

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| Poole Harbour Nutrient Management Scheme                                                                                    | This scheme created by farmers for farmers is the best opportunity for farming in the Poole Harbour catchment to remain viable, profitable and compliant. Farmers will be able to trade nitrate credits with financial value, to support changes to farming practice.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <a href="https://pooleharbournitrates.org.uk/">https://pooleharbournitrates.org.uk/</a>                                                                                                                     | Led by farmers, with a range of stakeholders involved and independently funded.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Catch the Carbon - Synergies between climate measures in the land use sector and water management                           | Finland aims to be climate neutral by 2035 and the world's first fossil-free welfare society. To achieve this goal, we will accelerate emission reduction measures and enhance our carbon sinks in a multiobjective manner through a holistic approach also including water management. As a part of the initiative we are developing a comprehensive climate program for the land use sector. The program will include investments in scientific research, data and implementation of best practices. As a whole, they provide new knowledge and tools for comprehensive and crosscutting integrated watershed management.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <a href="https://mmm.fi/en/climate-plan-for-the-land-use-sector">https://mmm.fi/en/climate-plan-for-the-land-use-sector</a><br><a href="https://mmm.fi/documents">https://mmm.fi/documents</a>              | Finnish Government in co-operation with public-, private- and third sector                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Transforming Investments in African Rainfed Agriculture (TIARA)                                                             | Africa has a significant food security challenge. At the centre of this challenge is the African smallholder farmer, typically engaged in rainfed subsistence farming. Smallholder farmers contribute up to 90% of food production in some sub-Saharan African countries. Crop yields are amongst the lowest in the world. Regenerating the rural economies of Africa will only be effective if water is available and used effectively. Smallholder rainfed farmers are the frontline managers of water. Typically, these farmers, have little or no support or training in the management of these scarce rainfed water resources and the land on which they depend. Enhanced rainfed agriculture incorporates a range of approaches that increase the availability and improve the management of green water. These approaches use locally captured and stored sources of rainwater, leading to an increase in soil moisture at the root zone. Many existing approaches are built on traditional practices and closely aligned to regenerative agriculture, rainwater harvesting and conservation agriculture. Increasing crop yields in rainfed smallholder farming enables subsistence farmers to commercialize, thereby contributing to agricultural value chains, creating income and providing a route out of poverty. Increasing crop yields at a farm-by-farm level at sufficient scale also brings positive knockon effects throughout the rural economy such as employment and health, enabling a wide range of related off-farm economic activity to develop. This has the cumulative macro effect of helping rural populations to contribute to national economies, bringing into play vast pools of human capital which is currently under-productive/producing. TIARA brings together the science of green water with an in-depth understanding of the context and enabling environment, to trigger investments into this sector. | <a href="https://www.siwi.org/what-we-do/transforming-investments-in-african-rainfed-agriculture-tiara/">https://www.siwi.org/what-we-do/transforming-investments-in-african-rainfed-agriculture-tiara/</a> | Based on the TIARA initiative, SIWI developed a pilot project 'Zambezi TIARA' project 2020 -2025 to build case studies aimed at influencing policy by showcasing the benefits of enhanced rainfed agriculture to improve and safeguard smallholder farmers' livelihoods in the Zambezi River Watercourse. The Zambezi Watercourse Commission (ZAMCOM) has developed a Strategic Plan (ZSP) of the Zambezi Watercourse with a "Livelihoods Support" Pillar/Component, which provides for the entry and integration of the development of investment initiatives into rainfed agriculture in the Zambezi Watercourse. This strategy aims to increase the availability of water for smallholder farmers and improve rainfed agriculture practices. SIWI supports ZAMCOM's implementation of the Strategic plan through the TIARA initiative |
| Climate change adaptation measures for sustainable livestock farming in the middle and lower basin of the Santa María River | It seeks to implement adaptation strategies in cattle farms affected by climate variability, in order to increase climate resilience and environmental quality through the implementation of silvopastoral systems (SSP) in the Santa María River Basin with an integrated approach to sustainable use. It includes the establishment of 600 ha with a Silvopastoral Systems approach, the creation of 120 Farm Management Plans.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <a href="https://adaptacion.miambiente.gob.pa/agropecuaria/">https://adaptacion.miambiente.gob.pa/agropecuaria/</a>                                                                                         | Ministry of Agricultural Development (MIDA) of Panama, GEMAS, CIPAV and ELTI.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

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| Implementation of agroforestry and soil conservation systems in the upper part of the Santa María river basin.                                                                      | Promote improvements in the health of ecosystems and the generation of income to increase the resilience capacity to climate change and adaptation of communities; supporting coffee production in the Santa María River Basin. It includes the establishment of 200 hectares of agroforestry systems.                                                                                                                                                                                                                                                                          | <a href="https://adaptacion.miambiente.gob.pa/agropecuario/">https://adaptacion.miambiente.gob.pa/agropecuario/</a> | Ministry of Agricultural Development (MIDA) and Foundation for Sustainable Integrated Development.                                                                                                                                    |
| Improvement of climate resilience in the agricultural production of the Chiriquí Viejo river basin (CHRCHV), through the establishment of efficient and low-cost irrigation systems | This project seeks to increase the efficiency in the use of water for the sustainable production of agricultural items through the use of low-cost irrigation technologies, which allow optimizing water availability according to the needs of vegetable crops in the upper basin and of rice in the lower basin of the Chiriquí Viejo river. It includes the establishment of low-cost and efficient irrigation systems, the strengthening of the capacities of the producer partners and the establishment of the water footprint for the production of rice and vegetables. | <a href="https://adaptacion.miambiente.gob.pa/agropecuario/">https://adaptacion.miambiente.gob.pa/agropecuario/</a> | Ministry of Agricultural Development (MIDA)                                                                                                                                                                                           |
| Sense_drink                                                                                                                                                                         | Côte d'Ivoire                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <a href="https://fondationclida.org/">https://fondationclida.org/</a>                                               | Dobo Topo Aimé                                                                                                                                                                                                                        |
| Establishment of riverside reforestation and agroforestry projects with coffee and soil conservation systems in the Caisán River sub-basin, Renacimiento, Chiriquí, Panama.         | This project seeks to increase adaptive capacities to climate change and climate variability by stimulating the restoration and protection of natural resources by optimizing the production of agroforestry systems and riverine reforestation for soil conservation in the Caisán River sub-basin. Agroforestry systems are established, implementation of riparian reforestation measures and technical assistance and environmental monitoring.                                                                                                                             | <a href="https://adaptacion.miambiente.gob.pa/agropecuario/">https://adaptacion.miambiente.gob.pa/agropecuario/</a> | Ministry of Agricultural Development (MIDA), Tropical Agricultural Research and Teaching Center (CATIE), Renaissance Producers Association (APRE).                                                                                    |
| Fertigation: A Nutrient- and Water-Efficient Precision Agriculture Tool                                                                                                             | Fertigation entails applying water-soluble fertilizers through irrigation systems to supply plants with their daily water and nutrient needs. It allows for optimum efficiency of resources such as water and wastewater; and can result in high crop yields and up to 90% nutrient use efficiency. It is a promising solution for climate change adaptation and mitigation, and has important co-benefits for food security (as it could help feed 25% of the world's population living in water-stressed regions).                                                            | <a href="https://www.fertilizer.org/">https://www.fertilizer.org/</a>                                               | Fertigation can be implemented by all farmers in water-stressed regions, and there is a great opportunity for governments, NGOs and the private sector to partner to encourage the wider adoption of microirrigation and fertigation. |
| Action Platform for Source-to-Sea Management                                                                                                                                        | The Action Platform for Source-to-Sea Management (S2S Platform) was launched in 2014 as a multi-stakeholder initiative to exchange and generate knowledge, and support joint action for improved management of land, water, coastal and marine linkages. The S2S Platform is open to all stakeholders that are committed to improving coherence and coordination in land, water and                                                                                                                                                                                             | <a href="https://www.siwi.org/what-we-do/source-to-sea/">https://www.siwi.org/what-we-do/source-to-sea/</a>         | The S2S Platform is hosted by SIWI                                                                                                                                                                                                    |

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|                                                                                                                                           | coastal management. Particular strengths of the S2S Platform include its ability to bridge the knowledge-policy-practice space by mobilizing and drawing upon a diverse set of partners engaged in research, policy making, funding and implementation of source-to-sea actions. It focuses on governance and management innovations to address the full range of source-to-sea issues.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                     |                                                                                                                                                                                                                                                        |
| Exclosures for landscape restoration                                                                                                      | Restoring degraded ecosystems by setting up exclosures is an increasingly common practice in the Ethiopian Highlands. Exclosures are communal areas that were traditionally 'open access', but where wood cutting, grazing and other agricultural activities are now forbidden or strictly limited to promote restoration and natural regeneration (Photo). The overall area covered by exclosures is currently increasing by 2%/year and could reach 5-7 million ha by the early 2030s. Similar rehabilitation of degraded rangelands has been fostered by establishing exclosures in different parts of Africa and Asia. This trend in exclosure expansion is attributable to their many benefits: restoring degraded landscapes, increasing carbon sequestration, and improving other ecosystem services. This can provide opportunities for livelihood diversification, and thus enhancement, decrease soil erosion and seed loss in farmlands located downslope of exclosures (photo), thereby helping boost agricultural productivity over the medium to long term. Overall, due to the cumulative benefits of exclosures in an agroecological setting, they can contribute to both environmental and community resilience by strengthening agricultural production at landscape levels | No link was provided                                                                                                                                                                                | IWMI together with national and international partners                                                                                                                                                                                                 |
| Research - Building Peace around Water, Land and Food                                                                                     | This research links best practice for water/land/food implementation strategies grounded in public participation and strengthening peacebuilding roles alongside more sustainable, just and ambitious implementation strategies.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <a href="https://quino.org/">https://quino.org/</a>                                                                                                                                                 | Quaker United Nations Office, Geneva                                                                                                                                                                                                                   |
| KUnzila Integrated Landscape Management and WASH Project (ILMWA)                                                                          | The project is designed to address five important and interlinked aspects: 1. Sustainable management of water and land resources through participatory IWM approach, 2. Agricultural development and livelihoods, 3. Rural and Urban WASH (100% coverage of project beneficiaries), 4. Capacity building and 5. An inbuilt scientific monitoring to generate empirical evidences for upscaling. This makes the project unique - it is not purely environment protection or agriculture but it focusses in improving environmental quality, livelihoods, resilience and generating knowledge.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <a href="http://www.wlrc-eth.org">www.wlrc-eth.org</a>                                                                                                                                              | The water and Land Resource Center (WLRC) in collaboration with SNV is implementing the project. The project implementation is fully participatory and thereby the local communities and authorities are the drivers                                   |
| Improved Food security and nutrition in the Sahel by safeguarding wetlands through ecologically sustainable agricultural water management | This project focusses on safeguarding wetlands in the Sahel as key food producing areas as a result from its variety of ecosystem services. The project promotes more sustainable agricultural water use, agro-ecological practices and ecological restoration by smallholder farmers, agricultural services service providers and local governments in Mali and Ethiopia. Parallel a market access and value adding chain is added to the project.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <a href="https://www.wetlands.org/casestudy/sawel-safeguarding-sahelian-wetlands-for-food-security/">https://www.wetlands.org/casestudy/sawel-safeguarding-sahelian-wetlands-for-food-security/</a> | Wetlands International (lead), Caritas Switzerland, IWMI, Hydrosolutions Ltd and a number of local partners in each of the implementation sites and financed through SDC's Global Program on Food Security and numerous additional co-funding sources. |
| Farmer Managed Natural Regeneration FMNR                                                                                                  | FMNR practices are known for its vast importance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <a href="https://onemoresalary.com">https://onemoresalary.com</a>                                                                                                                                   | ONE MORE SALARY                                                                                                                                                                                                                                        |

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| CFS Voluntary Guidelines on Governance of Tenure                                                             | The CFS VGGT is a policy document negotiated by member states and key stakeholder groups that provides a clear framework by which govts and other parties can effectively address tenure issues on land, fisheries, and forestry. The CFS VGGT have been used in many countries to create legal and regulatory frameworks for managing tenure rights and setting governance standards. They have become the global reference point used by numerous agencies and organizations to improve governance of tenure.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <a href="http://www.fao.org/cfs/policy-products/en/">http://www.fao.org/cfs/policy-products/en/</a>                                                                                                                                                                 | FAO, IFAD, World Bank, UNFCCC, and a large number of countries, NGOs, donors and others are using the CFS VGGT for a wide variety of tenure-related projects, including UNFCCC's work on land degradation neutrality. More on FAO's work and projects can be found here: <a href="http://www.fao.org/tenure/voluntary-guidelines/en/">http://www.fao.org/tenure/voluntary-guidelines/en/</a> . |
| Community based forest management                                                                            | Besides empowering local communities, the community forest conserves land resources, including soils, water, animals and plants, to meet changing human needs, while simultaneously ensuring the long-term productive potential of these resources and the maintenance of their environmental functions. It maintains biodiversity, productivity, regeneration capacity, vitality and their potential to fulfill, now and in the future, relevant ecological, economic and social functions, at local, national, and global levels, and that does not cause damage to other ecosystems. Land degradation can be reversed through restoration and rehabilitation. To avoid, reduce or reverse degradation, forest management activities can be selected to mitigate the impact of, and adapt to, climate change. In some cases, climate change impacts may result in increased productivity and carbon stocks, at least in the short term. The types and intensity of human land-use and climate change impacts on lands affect their carbon stocks and their ability to operate as carbon sinks | <a href="https://dofsc.gov.np/">https://dofsc.gov.np/</a>                                                                                                                                                                                                           | Government of Nepal                                                                                                                                                                                                                                                                                                                                                                            |
| Uruguay: "Responsible soils use and management plans in croplands"                                           | One main environmental problem in Uruguay in the past has been the hydric erosion of soils. Erosion not only affects the quality of the soil, but also generates the most important cause of water pollution associated with cropping activities. The policy promotes the use of soils according to their capability. One particular features is that the policy require farmers to present a land use and management plan for the farm and applying the Soil Loss Equation (USLE-RUSLE) calibrated for Uruguay, ensure that soil losses can be expected to be below a threshold considered sustainable.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <a href="https://www.gub.uy/ministerio-ganaderia-agricultura-pesca/cuidado-suelo">https://www.gub.uy/ministerio-ganaderia-agricultura-pesca/cuidado-suelo</a>                                                                                                       | The programme is implemented by the Ministry of Agriculture of Uruguay, who is the national authority for soils conservation and management.                                                                                                                                                                                                                                                   |
| Senegal - Project to Support Local Small-scale Irrigation (PAPIL)                                            | National Agriculture/Food Policy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <a href="https://www.afdb.org/fr/news-and-events/multimedia/video/senegal-project-to-support-local-small-scale-irrigation-papil-562">https://www.afdb.org/fr/news-and-events/multimedia/video/senegal-project-to-support-local-small-scale-irrigation-papil-562</a> | Ministry of Agriculture and Rural Equipement (Senegal)                                                                                                                                                                                                                                                                                                                                         |
| PROJET DE RENFORCEMENT DE LA RESILIENCE DES ECOSYSTEMES DU FERLO. ECOSYSTEM RESILIENCE REINFORCEMENT PROJECT | C'est projet qui vise la revitalisation des vallées fossiles. Créer les conditions de développement des activités socio-économiques et des écosystèmes de la zone agro-sylvo-pastorale du Ferlo par la satisfaction durable des besoins en eau des différents usages (agriculture, élevage, écosystème etc.) La mise en œuvre va contribuer au développement d'une agriculture moderne et accessible à un plus grand nombre de producteurs.<br>It is a project that aims to revitalize fossil valleys. Create the conditions for the development of socio-economic activities and ecosystems in the agro-sylvo-pastoral zone of Ferlo by the sustainable satisfaction of the water needs of the different uses (agriculture, livestock, ecosystem etc.) The implementation will contribute to the development of modern agriculture accessible to a greater number of producers.                                                                                                                                                                                                                | <a href="https://www.olac.sn/projets/preferlo/">https://www.olac.sn/projets/preferlo/</a>                                                                                                                                                                           | The Senegalese Ministry of Water and Sanitation/ Lakes and Water streams (OLAC)                                                                                                                                                                                                                                                                                                                |
| Carbon balance in agricultural                                                                               | Comprehensive approach for agricultural management integrating forest management within farms                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | No link was provided                                                                                                                                                                                                                                                | This is a grant, implemented by INIA                                                                                                                                                                                                                                                                                                                                                           |

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| systems of Southern Chile                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                    |
| Land Degradation Neutrality in Brazil                             | It is a good example because, compared to plowed systems with monoculture, tropical acidic soils ie. Ferralsols, Lixisols can be more sustainably managed using good practices avoiding soil erosion, sequestering carbon at depth into the soil, promoting aquifer recharge and leading to optimum yields. Soil and water conservation adopted at catchment levels combined with improved crop varieties and integrated pest management have resulted in national food security and supply at affordable prices. Finally, also as a consequence of knowledge based practices, large areas (approx. 11 million ha) of degraded pasture have been restored by integrated crop-pasture systems. Despite knowledge intensive, Brazilian farmers are generally open and keen to adopt good practices if likely to be less risky. | <a href="https://www.cgee.org.br/documents/10195/734063/land-degradation-neutrality.pdf">https://www.cgee.org.br/documents/10195/734063/land-degradation-neutrality.pdf</a>                                                                                                                                                                                                                                                               | Embrapa and State Research & Extension Services (IDR Parana, Emater RS, Emater Goias, EPAGRI, IAC, Emater MG, INCAPER, EBDA) and Agricultural Colleges at UFRGS, UFSM, UFLA, UFV, USP-ESALQ, UFRRJ |
| Traditional food, the right to food, and sustainable food systems | Using the traditional erva-mate food production systems in southern Brazil and indigenous traditional food harvesting systems in the Northwest Territories of Canada, the case studies explores shared community responses to global pressures as the basis for building knowledge sharing networks grounded in UN frameworks including the Right to Adequate Food (RtAF), the UN Declaration on the Rights of Indigenous People, and the Convention for the Safeguarding of Intangible Cultural Heritage.                                                                                                                                                                                                                                                                                                                   | <a href="https://www.taylorfrancis.com/chapters/edit/10.4324/9780429466823-6/traditional-food-right-food-sustainable-food-systems-alison-blair-palmer-andrew-spring-evelyn-nimmo-andr%C3%A9-eduardo-biscaia-de-lacerda">https://www.taylorfrancis.com/chapters/edit/10.4324/9780429466823-6/traditional-food-right-food-sustainable-food-systems-alison-blair-palmer-andrew-spring-evelyn-nimmo-andr%C3%A9-eduardo-biscaia-de-lacerda</a> | Embrapa, in Brazil                                                                                                                                                                                 |