A woman wearing a vibrant red and green sari is crouching in a field of young green plants. She is looking down at the plants with a focused expression. The field is covered with a thatched roof made of bamboo or similar natural materials, which casts shadows on her and the plants. The background shows more of the field and some trees under a bright sky.

Nordic Climate Facility

NEWSLETTER 2013

Fourteen contracts awarded under the third call of the Nordic Climate Facility

Nordic Climate Facility (NCF), financed by the Nordic Development Fund (NDF), encourages Nordic companies and organisations and their counterparts in low-income countries to join forces to tackle the changing climate. Through NCF, partial grant financing is provided to projects that support exchange of knowledge and technological know-how in the field of climate change.

NCF is administered by the Nordic Environment Finance Corporation (NEFCO).

The third call for proposals focused on low-cost climate solutions with a strong positive impact on local business development. Financing was granted to the 14 highest scoring applications out of the total of 128.

Kenya

Transforming human waste into energy and organic fertilisers

Niras Natura AB in Sweden, together with their Kenyan partner **Umande Trust**, will construct a biogas and fertiliser plant which will utilise human waste from public latrines to produce energy and natural fertilisers. The objective of the initiative is to cut down greenhouse gas emissions - especially methane - originating from unprocessed waste and chemical fertilisers. Methane has a high global warming potency, and sewage is one of the major sources of methane emissions globally.

Currently, public latrines in Nairobi face challenges due to the strong demand for sanitation services. The sanitation centres do not have the necessary storage



Photo: Anja Nystén

Sanitation centre.

capacity for the high volume of waste and biogas. The bi-slurry typically ends up being disposed of in rivers or landfills due to the inadequate sewage treatment system, and methane is released to the atmosphere. The waste dumping contributes to global warming and harms health and the environment. In addition,

the costs relating to waste disposal lead to considerable decreases in the monthly incomes generated by the latrines, which impede further expansion of communal latrine services.

The biogas and fertiliser plant will help to reduce negative environmental impacts and cut the waste and disposal costs faced by public latrines. The plant will process the latrine waste and process it into high quality organic fertilisers and biogas, which can be sold in the local markets. The unique design of the project will combine provision of urban sanitation and commercial production of both renewable energy and organic fertilisers. Finally, increased income will help to further expand the provision of sanitation services, which together with decreased latrine overflow can reduce the risk of water borne diseases.

Cambodia and Laos
Scaling up low-carbon water purification technologies

Access to clean drinking water is recognised as a basic human right, but more than a billion people worldwide still lack access. In Cambodia and Laos, up to 90 per cent of the population boil their drinking water to reduce the risk of water-borne diseases. Boiling, when done properly, is an effective method for killing most bacteria, viruses and pathogens, but it is also highly energy-intensive and time-consuming. The boiling costs have been increasing due to the scarcity of fuel-wood. This increases the risk of non-boiling amongst the poorest income groups. The availability of innovative low-cost alternatives, such as ceramic water purifiers, has been limited. The full availability has so far been restricted by the lack of external funding required for scaling-up measures.

Finland Futures Research Centre, together with **Hydrologic Social Enterprise** and **Nexus Carbon for Development** from Cambodia and **TerraClear**

Development Company Ltd. from Laos, will introduce a framework which can lead to the dissemination of more than 550,000 ceramic water purifiers in Cambodia and Laos by 2020. The project creatively utilises an established and proven low-carbon water purification technology, the ceramic water purifier, and will introduce a carbon financing framework.

Funding from voluntary carbon markets will support the much-needed scale-up measures of low-carbon water purification technologies. The project will develop two Voluntary Gold Standard projects to

run in parallel, one in Cambodia and one in Laos. Local supply chains will be strengthened to create jobs in producing, selling, marketing and distributing the purification technologies. The project will produce and distribute ceramic water purifiers, aiming to have around 74,000 units in use by 2014, yielding an issuance of around 112,000 tons of CO₂ reductions by 2014. In addition to reduced carbon dioxide emissions, the project can strengthen the adaptive capacity of the population through improved access to clean drinking water and reduced dependency on firewood.



Photo: Suzanne Chew

Making final adjustment to a ceramic water filter.

Tanzania

Turning agricultural waste into improved soil conditions, energy and income for women

Rice is the second most important food and commercial crop of Tanzania after maize. The production of rice leaves rice husk as a waste material, which is often burned or disposed on site. **The Royal Norwegian Society for Development (Norges Vel)**, in cooperation with **Rural Development Initiatives, Tanzania Traditional Energy Development Organisation** and **Norwegian Geotechnical Institute**, will implement a project that will utilise rice husk to produce biochar for improving local soil quality as well as for further processing into briquettes. Biochar improves the soil water retention capacity and bind nutrients in the ground, and can therefore increase agricultural productivity and improve food security during dry seasons.

The project will install multifunctional carbonisation retorts, which will be powered by rice husk and other agricultural waste. The resulting biochar will be sold by local entrepreneurs, and the excess biochar will be further refined into cooking briquettes, which can be used in cooking stoves to replace traditional carbon-intensive fuels, such as firewood and charcoal. The project will establish women entrepreneur groups, who can utilise the excess heat from the carbonisation process to run local bakeries, cafes and catering firms. The innovative production process promotes synergies between various production phases and underlays possibilities for income-generating activities in different sectors.

The project has great potential to cut CO₂ emissions, decrease deforestation, improve soil quality and promote local business opportunities through simple climate-friendly solutions. The project aims to establish broad support and further replication within the country through sensitisation and sharing of information and technology.

Kenya, Rwanda, Tanzania and Uganda Climate change adaptation for Fairtrade tea producers

The weather conditions and sloping grounds of East Africa makes the region ideal for growing tea. One-fourth of global tea exports come from the region, and the tea industry provides a living for a large number of small-scale farmers and seasonal workers in East Africa. Small-scale tea farmers are highly vulnerable to climate change due to reliance on rainfall patterns and cool temperatures. Fairtrade tea producers in East Africa have requested resources for monitoring weather changes, assessing risks and developing strategies to increase climate change resilience.

The Swedish foundation **Vi-Skogen** as well as **Vi Agroforestry** (registered as a non-governmental organisation in Kenya, Uganda, Tanzania and Rwanda) together with Kenya-based **Fairtrade Africa** and **Fairtrade International**, are answering the producers' request



Photo: Fairtrade Africa

Fairtrade tea producer.

by proposing a set of activities that will build the adaptive capacity and climate resilience of Fairtrade small tea producer organisations in Kenya, Rwanda, Tanzania and Uganda. The project will provide technical assistance and training on sustainable land use management, including agroforestry and water and soil conservation. New practices aim to increase yields in a sus-

tainable manner, build resilience in production and provide additional ecosystem services, such as fruits, timber and seedlings.

Furthermore, the project will support Fairtrade producers to develop adaptation risk and opportunity assessments and to provide a technology-based information-sharing platform. The innovative and holistic approach encourages commercial actors

along the supply chain to take an active role in investing in climate change adaptation. The initiative will utilise the existing Fairtrade framework by focusing on adaptation with producers that are already empowered to meet social, economic and environmental standards, thus contributing to a more comprehensive approach with higher chances of success.

Ghana Sustainable Biomass Charcoaling

Firewood and charcoal are important sources of energy for the majority of the Ghanaian population, and for a great number of people charcoal production and trade is the only source of income. Urban migration has increased the demand for charcoal, and illegal charcoal production is putting additional pressure on the indigenous forests of Ghana.

Pöyry Management Consulting Oy from Finland, Ghana-based **African Plantations for Sustainable Development**, **WWF West Africa Forest Programme Office** and four **traditional councils** as the local partners from Ghana are implementing a project which advocates sustainable forestry together with energy-efficient char-



Photo Tuomo Utraiainen.

Tree nursery within the project area.

coal production. The project will establish 19 energy wood plantations to provide wood for seven charcoal production plants for the use of local entrepreneurs. Compared to current charcoal production practices, the novel distillation technology introduced by Pöyry produces higher quality charcoal and requires only one-third of the natural resources.

The project will set up a cooperative which will bring together entrepreneurs of both charcoal production and tree plantations and create job opportunities in forestry, logistics, charcoal manufacturing and sales. The local community decision-makers and traditional councils, in cooperation with the African Plantations for Sustainable Development and

WWF, have selected and allocated the lands for the wood plantations, in areas that are unused or unsuitable for agriculture. The charcoal plants are implemented using local construction materials and workforce.

The project will help mitigate climate change by reducing illegal harvesting from natural forests and by introducing new wood plantations. The project aims to improve energy security and eradicate poverty through local entrepreneurship. The simple and efficient technology is hoped to encourage further development of sustainable charcoal production in the region. The project also aims to develop a new charcoal production model that through proven success would attract local investors and lead to project multiplication within Ghana and elsewhere in Africa.

Nepal
Community based business from non-timber forest products

Land degradation, soil erosion and forest fires, are major contributors to rural poverty in Nepal. Heavily degraded forest areas no longer perform their full natural ecosystem roles, such as protection against weather and provision of firewood and non-timber products. The degradation of forests directly translates into worsening livelihoods for the communities that depend on these services.

Danish Forestry Extension, Wildlife Conservation Nepal, Choudhary Biosys Nepal Pvt Ltd, and Biosynergy Ltd are implementing a project that provides benefits to local residents of fragile landscapes. The project will promote non-timber forest products, which contribute in building ecosystem resilience against climate change in local communities. The non-timber products are mostly essential oils to be sold to the organic cosmetics industry. These products have a high value

per volume, and therefore no sophisticated logistics are required to bring the products to the markets.

The underlying idea is to increase the livelihoods amongst local households through agro-forestry and sound management of natural forest areas in five community forestry user groups. Appropriate low-cost production technology will be transferred to communities and the producers will be linked to a well-established market. The project team is also currently studying the possibility of trading the sequestered carbon in the voluntary carbon markets, which would provide additional revenues for the communities. In addition, to sequestered carbon, the change in land management practices towards climate-resilient ecosystems improves ground water availability, reduces negative effects of extreme weather events and increases soil quality. Due to the effective low-cost approach, the project has a high chance of replication amongst adjoining community forests.



Distillation of chamomile.

Photo Choudhary Biosys Nepal Pvt

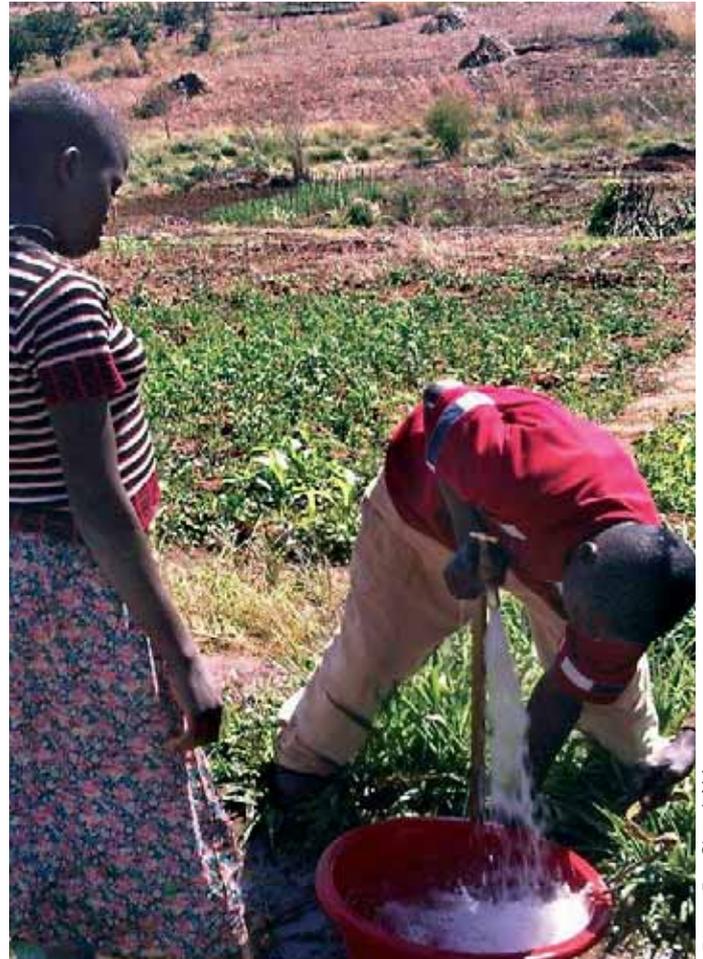


Photo: DanChurchAid

Field water pipes for irrigating crops.

Malawi
Mainstreaming climate-smart agriculture

Agriculture is the mainstay of Malawi's economy and small-holder farmers dominate the sector. Small-holder farmers are highly susceptible to climate change as their incomes depend almost solely on rain-fed irrigation, leaving them strongly affected by droughts and dry spells. The low profitability of smallholder agriculture is further exacerbated by weak links to markets. A Danish organisation, DanChurchAid, together with its local counterparts Church Action in Relief and Development, Christian Service Committee of the Churches in Malawi and Kusamala Institute of Agriculture & Ecology, is implementing a project that aims to improve the adaptive capacity of small-holder farmers and tackle the development obstacles in the sector.

The project will support 15,000 farming households

in adapting to climate change and to mitigate emissions through new agriculture practices. Smart agriculture techniques, including organic fertilisers, agro-forestry, high-yield crop varieties and conservation farming are expected to lead to environmental and financial sustainability. Replacing inorganic fertilisers with organic substitutes help reduce CO₂ emissions from agriculture and an inventory of other greenhouse gas emission sources will be prepared to provide baseline information and guidance for further development of climate smart agriculture practices.

The farmers will also be supported in accessing viable markets and adopting effective marketing strategies to increase their incomes. The project takes a unique holistic approach to combine climate adaptation, mitigation and agricultural development, in an integrated and sustainable way.

Tanzania
Sustainable business models for producing non-wood charcoal briquettes

Firewood and charcoal account for more than 90 per cent of total energy use in Tanzania. Charcoal is the largest source of household energy in urban areas, and more than a million tons of charcoal are consumed annually in the country. The production of charcoal is a major contributor to deforestation and CO₂ emissions. The project implemented by Gaia

Consulting Oy from Finland, together with **Appropriate Rural Technology Institute** from Tanzania, aims to reduce deforestation, mitigate greenhouse gas emissions and support local livelihoods by introducing sustainable non-wood-based charcoal businesses in Tanzania.

The project will train 770 entrepreneurs and provide 120 non-wood charcoal kilns to enable production of sustainable charcoal. Sound business models will be established for community-based enterprises. The project answers to the existing high demand for charcoal

and aims to introduce an affordable and more sustainable alternative to unsustainable charcoal. The approach utilises agricultural waste, instead of fuelwood, in producing high quality charcoal briquettes. This technology has so far been introduced only in a limited context in the country.

The reduced demand for fuelwood will mitigate CO₂ emissions originating from forestry and charcoal production. In addition, the project will reduce the pressure on Tanzanian forests, which will positively affect

watershed management and biodiversity. The project is in line with the government's overarching development plan by providing alternatives to wood-based charcoal production and supporting renewable energy in general. Training of the entrepreneurs and development of the community-based enterprises will particularly provide new income opportunities for people in rural areas and encourage women to engage in all aspects of charcoal industry, increasing their social standing.



Briquette extruder at Bakamoyo Brikwiti Company.

Photo: Kari Hämeikoski

Bolivia
Promoting climate resilient crops for Bolivian highlands

Harsh weather conditions and poverty make the population in the Bolivian highlands prone to food related disasters. Melting of glaciers is expected to exacerbate water shortages, and delayed rainy seasons are seriously affecting crop productivity. Changes in precipitation patterns create a need for crops with short growing cycles and good tolerance for extreme weather conditions, such as drought and frost. Cañahua is a native but highly under-utilised goosefoot plant of Bolivia. Cañahua is a close cousin to quinoa, and it is characterised by its high

nutrition content and good resilience to extreme weather conditions.

A project implemented by the **University of Copenhagen's Department of Plant and Environmental Sciences**, together with their local partners in **Fundación para la Promoción e Investigación de Productos Andinos**, will promote cañahua production among poor Andean households through the introduction of varieties adapted to new climate patterns with an application of appropriate crop and land management techniques. Furthermore, the project will implement a pilot plant for cañahua seed processing and strengthen local community organisations to develop markets and generate income in the food chain.

The project supports the Andean population to adapt to extreme weather events and to reduce the economic losses due to a shortened growing season. In addition to improved food security, the project contributes to generating higher incomes for farmers by linking farmers' organizations to different markets. The pilot implementation will be situated in the northern high-

lands, which house a high diversity of cañahua in the most adverse climate conditions. The pilot region will help to identify and develop varieties suitable for other potential areas. The developed technology will be generated and distributed as a public good, with no restrictions on its further dissemination and use.



Cultivation of cañahua.

Photo: Alejandro Bonifacio

Bangladesh Recover the heat – renewing local steel production industry

Steel production in Bangladesh is highly concentrated in small and medium-sized enterprises. The production is mostly based on refining domestic scrap metal using inefficient technologies with high energy consumption, poor working conditions, significant negative environmental impacts and low production capacity. **Viegand & Maagøe A/S** together with **NIRAS A/S**, from Denmark, **Modern Erection Ltd** and **Vikrampur Steel Ltd** as well as the **Royal Danish Embassy** in Bangladesh, will support the improvement of energy efficiency and working conditions in steel production. The project will pilot simple locally produced energy savings technology, which recovers lost heat from steel melting furnaces and reuses the energy to preheat incoming scrap. The new solution will lead to energy savings, reduced CO₂ emis-

sions and production time as well as improved working conditions. The optimised production methods will be disseminated through training workshops for the staff involved in the daily production. The project will also develop a draft Nationally Appropriate Mitigation Mechanism (NAMA) proposal for implementation in the steel sector in Bangladesh. The NAMA will be prepared in close cooperation with the Government of Bangladesh, represented by the Department of Environment.

The pre-heat systems have been already installed in large furnaces in Europe and the United States, but the small-scale adoption of the technology is still limited. The current steel production practises are commonly used all over Asia in hundreds of steel melting shops. Therefore, there are potential business development perspectives both in Bangladesh and in the region for this energy-efficient and environmentally friendly technology.

Burkina Faso Food security with eco- logical food processing



Photo: Maija Saijonmaa

Rice husk will provide energy for the food processing unit.

Current agricultural production in Burkina Faso is concentrated on cultivating basic cereals, such as maize and sorghum, which cannot be produced during the dry season. Because the dry season is expected to become longer due to climate change, it is essential to support switching to more climate-resilient crops such as cassava. Improving and diversifying the country's food processing could reduce the country's vulnerability even further.

Danish Technological Institute's Energy and Climate Division, in collaboration with **Isomet Burkina Faso**, will pilot the first renewable and waste energy-based food production unit in West Africa. The installed food processing unit will be powered by biowaste and solar energy. The sustainable energy sources will have mitigation impacts through reduced demand for firewood in food processing. The versatile unit can be used to process a variety of food products, and the relatively simple technology can be imple-

mented elsewhere in the region with considerable income generation opportunities. Changing food consumption patterns have created a strong local, as well as global, demand for processed products and high quality groceries, which would meet the quality, hygienic and nutritional standards.

The unit will primarily concentrate on producing three selected products: parboiled rice, dried mangoes and cassava couscous. These products are creatively chosen so that rice husk provides biowaste for energy generation; dried mangos produce considerable profits to ensure financially healthy business; and cassava couscous promotes further cultivation of tuber plants. The unit will reduce the country's dependence on imported processed goods, promote the cultivation of climate resilient crops and demonstrate the economic viability of sustainable food processing for further replication.

Photo: Fridolin Müller Holm, Viegand & Maagøe



Steel casting.

Ghana Biomass briquettes – clean energy from agricultural and forest waste

Soaring demand for fuel wood in Ghana puts sustainable forest regeneration at risk and contributes to greenhouse gas emissions. For every newly-planted tree in Ghana, more than two are being simultaneously cut down in need for firewood and charcoal.

C.F. Nielsen A/S from Denmark, **Cook Clean Ghana Ltd** and **B2A Busi-**

ness to Africa join forces to ease the pressure on local forests by introducing new innovative technology which will provide clean energy to the Ghanaian market. The project will supply biomass briquettes, which can be directly used to substitute traditional wood fuels. The briquettes are made of agriculture and forestry residuals, most importantly of saw dust, but also of maize cobs, and sorghum and millet stalks, which otherwise would be disposed or incinerated.

The briquettes' production process transforms the waste into an end product which burns longer with less smoke compared to traditional fuel wood.

The project will install the first biomass briquetting plant of this type in Ghana and transfers knowledge on the production and use of biomass briquettes. The briquette production is expected to create local business opportunities. If successful, the project is planned to be used as a model for replication in other West African countries.



Photo: Maija Saijonmaa

Currently, the saw dust waste from saw mills is burned instead of utilising it.

Cambodia
Carbon sequestration in farmlands

Agriculture is one of the largest sources of global greenhouse gas emissions, but the sector also provides large mitigation potential. Mitigation measures in agriculture involve strong co-benefits for sustainable development, such as improvement in food security and better environmental services.

Nordic Agency for

Development and Ecology and Cambodian Centre for Study and Development in Agriculture will mitigate greenhouse gas emissions by introducing a carbon sequestration scheme which will reward Cambodian small-holder farmers for practising climate-smart farming. The project will disseminate practical approaches to climate-resilient agriculture, concentrating on creative low-cost ways to organise tree planting in the farming

landscape. The project will establish a business which will connect with the existing farmers' associations, and support them to increase their incomes from carbon sequestration. The farmers will be therefore linked to the voluntary carbon markets in an innovative and cost-effective way. In addition, the project plans to develop eco-agro tourism in rural Cambodia in connection with the climate-smart farming, introduce small-

scale biochar production and develop advisory services for mitigation aspects of sustainable agriculture.

The project will provide small-holder farmers income opportunities and improved financial security, while including considerable environmental benefits. The benefits are not restricted to mitigation; additional adaptation benefits are expected through decreased erosion and improved ground-water availability.



A plant nursery at a multipurpose farm.

Photo: Kari Hämeoski

Ghana
Rainwater harvesting for improved climate resilience

SINTEF from Norway, in collaboration with **Water Research Institute** and the **Science and Technology Policy Research Institute of the Council for Scientific and Industrial Research** in Ghana, will provide urban households and institutions improved access to water through affordable, simple and safe rainwater harvesting (RWH) systems. In the capital city of Accra, only approximately one-fourth of the city's population enjoys 24-hour water supply. Water security is also affected by more extreme

and unpredictable rainfall events. Effective RWH systems can decrease the risk of urban flooding during extreme rainfall events while providing access to clean water during prolonged dry seasons expected as a result of climate change. Furthermore, an RWH system in urban areas can increase local retention of rainwater and therefore act as an adaptation measure to flood-related climate change impacts.

The project assesses the most appropriate solutions for rainwater harvesting, monitoring and disinfection, and implements model systems in selected houses and institutions. The project



An example of an integrated RWH system with water filters.

Photo: Majja Sajonmaa

will create standardised design criteria and install innovative RWH systems. The model systems are monitored and evaluated, while local artisans are trained in how to construct and maintain such RWH systems, which will provide a basis for local business development.

The project is developed in line with the objectives of Ghana's National Rainwater Harvesting Strategy, which can be expected to improve project sustainability. In the long run, effective solutions and improved knowledge of RWH possibilities are expected to increase the use of such systems, improve the country's adaptive capacity and give rise to new business opportunities.

Contracted NCF3 projects

Host country	Nordic Partner	Project
Bangladesh	Viegand & Maagøe A/S, Denmark	NAMA and Innovative Energy Optimisation in the Steel Sector in Bangladesh
Bolivia	University of Copenhagen, Denmark	Promoting Cañahua in the Extreme Climatic Conditions of the Bolivian Altiplano: A Highly Nutritive Crop with Tolerance to the Effects of Climate Change
Burkina Faso	Danish Technological Institute, Denmark	Ecological Food Processing Unit
Cambodia	Nordic Agency for Development and Ecology, Denmark	Cambodian Farmland Carbon (CAFACA) Project
Cambodia and Laos	Finland Futures Research Centre, University of Turku, Finland	Scaling Up Low Carbon Household Water Purification Technologies in the Mekong Sub Region
Ghana	Pöyry Management Consulting Oy, Finland	Efficiency Enhancement and Entrepreneurship Development in Sustainable Biomass Charcoaling
Ghana	C. F. Nielsen A/S, Denmark	Biomass Green Briquette Fuel (GBF) Production (BidiePa) under Kitchen Efficiency Programme Ghana
Ghana	SINTEF, Norway	Rain Water Harvesting (RWH) for Resilience to Climate Change Impact on Water Availability in Ghana
Kenya	Niras Natura AB, Sweden	Business Development Closing the Rural-Urban Nutrient and Carbon Dioxide Cycles
Kenya, Tanzania, Uganda and Rwanda	The Foundation Vi Planterar Träd (Vi-Skogen), Sweden	ADAPTea: Climate Change Adaptation for FAIRTRADE Tea Producers in East Africa
Malawi	DanChurchAid, Denmark	Mainstreaming Climate-Smart Agriculture in Solar Irrigation Schemes for Sustainable Local Business Development in Malawi
Nepal	Danish Forestry Extension - DFE, Denmark	Developing Low-Cost Community Based Innovative Solutions to Mitigate and Adapt with Climate Change while Creating Viable Local Business Solutions
Tanzania	Norges Vel, Norway	From Waste to Local Business Development and Vigorous Soil
Tanzania	Gaia Consulting Oy, Finland	Sustainable Charcoal Business Development in Tanzania

Distribution of origin by country

Country	All proposals	Shortlisted proposals	Projects under implementation
Denmark	31	13	7
Finland	18	4	3
Iceland	2	1	0
Norway	24	7	2
Sweden	29	5	2
Other countries	24	0	0
Total	128	30	14

The Nordic Climate Facility (NCF) provides support to challenging and innovative projects that will increase low-income countries' abilities to mitigate and adapt to climate change. The facility is based on calls for proposals. Nordic entities with a local partner in a low-income country can apply for NCF funding. NCF is financed by the Nordic Development Fund (NDF) and implemented jointly with the Nordic Environment Finance Corporation (NEFCO).

NDF is a multilateral development finance institution established by the five Nordic countries. NDF provides grant financing for climate change interventions in low-income countries.

NEFCO is an international financial institution established by the five Nordic countries. NEFCO finances investments and projects in Russia, Ukraine, Estonia, Latvia, Lithuania, Moldova and Belarus, as well as climate change projects across the world.



For more information about NCF visit:
www.ndf.fi and www.nefco.org

