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JOINT NORDIC ORGANISATIONAL ASSESSMENT OF THE NORDIC DEVELOPMENT FUND (NDF)

ANNEX 1-15

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Joint Nordic Organisational Assessment of the Nordic Development Fund (NDF), Annex 1-15

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Kris Prasada Rao and Mira Berger

Rapport 2019:06
till
Expertgruppen för biståndsanalys (EBA)

This is a collection of the annexes to report 2019:06 for the EBA: Joint Nordic Organisational Assessment of the Nordic Development Fund (NDF)

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Expertgruppen för biståndsanalys

The Expert Group for Aid Studies

Stockholm 2018-08-20

Invitation for proposals: Joint Nordic Evaluation of the Nordic Development Fund (NDF)

The Expert Group for Aid Studies (EBA) is a government committee mandated to study the direction, governance and implementation of Sweden's official development assistance (ODA). The committee involves an Expert group of ten members, and a secretariat placed in Stockholm. The EBA engages researchers and other experts to carry out studies of relevance for policymakers and practitioners.

Together with the Evaluation Departments at the Nordic Development Cooperation Agencies – Norad/MFA Norway; Danida/MFA Denmark; MFA Finland; and MFA Iceland – the EBA hereby invites proposals for an evaluation of the Nordic Development Fund (NDF).

The procurement procedure will be a two-stage selective procedure with possible negotiation. This invitation includes information on both the first stage expression of interest and the second stage invitation to selected suppliers to submit tenders.

Background, aim and questions

The Nordic Development Fund

The Nordic Development Fund (NDF) is an international financing institution established by the governments of Denmark, Finland, Iceland, Norway and Sweden in 1988 as part of the Nordic countries' co-operation on development assistance. The original subscribed and paid-in capital by the Nordic countries is equivalent to approximately EUR 1 billion provided from the five countries' development cooperation budgets (Sweden 37%; Denmark 23%; Norway 21%; Finland 19%; Iceland 1%). The latest decision on replenishments took place in 2000.

According to its mandate from 2009, the objective of NDF's operations is to facilitate climate change investments primarily in low-income countries reflecting the Nordic countries' priorities in the areas of climate change (adaptation and mitigation) and development (regional profile of approved financing as of 2017-12-31: Africa 48% of capital, Asia 21%; Latin America 25%).

NDF finances projects usually in cooperation with bilateral, multilateral and other development institutions. Since 2016, in addition to grants, the NDF has expanded on its portfolio of financial instruments to include equity and loans. NDF also operates a challenge fund that finances

innovative climate change projects, the Nordic Climate Facility (NCF). NDF's active portfolio is valued at over 300 million EUR.

Aim and main questions of the evaluation

The future strategic direction of the NDF will be determined by its Board of Directors in mid-2019. To support its strategic deliberations, the Board has asked the government departments tasked with evaluating development cooperation of each Nordic country to perform an independent evaluation of the performance of NDF as an institution as well as of its value added in the international context, including as a Nordic institution, and how it could be strengthened.

This evaluation has two connected aims. The first is to assess the performance of NDF in accordance with its mandate. The second aim is to assess NDF's potential future role as a joint Nordic financing instrument for development.

The evaluation shall concern the mandate from 2009 and consider the financial base of the institution, the priorities of the Nordic countries, and recent international agreements (the 2030

Agenda, the SDGs and the Paris Agreement) in assessing the NDF's present role as a joint Nordic instrument in the international climate architecture as well as its potential future role, within climate change or other areas. Four main evaluation questions shall guide the evaluation:

(i) Assessing the performance of NDF in accordance with its mandate

1. Has the NDF delivered on its mandate?

2. What is the current value added of NDF in an international perspective?

(ii) Assessing NDF's potential future role as a joint Nordic financing instrument for development

3. What should key priorities be to further strengthen NDF's added value and comparative advantage in the international climate financing architecture?

4. Should the NDF play a different or wider role on behalf of the Nordic administrations, either through a broader climate change and development mandate or in other areas prioritised by the Nordic countries?

The main objective of the evaluation is to provide grounded and elaborate responses to the questions above. The four questions should address, but need not be limited to, the following sub-questions:

1. *Has the NDF delivered on its mandate?*

Has the NDF met expected results?

Has the steering of NDF been effective?

Are NDF contributions rooted in partners' priorities on a demand-needs basis?

2. *What is the current value added of NDF in an international perspective?*

Are the NDF's contributions additional/complementary to those of co-financing partners and other actors (e.g. the MDBs and climate funds)?

Does NDF create a "Nordic value added", as defined in section 2 of the NDF Strategy (2016)?

Does the NDF add to or reduce the potential problem of a rather fragmented and crowded international climate architecture?

3. What should key priorities be to further strengthen NDF's added value and comparative advantage in the international climate financing architecture?

Do the current results motivate new replenishments?

4. Should the NDF play a different or wider role on behalf of the Nordic administrations, either through a broader climate change and development mandate or in other areas prioritised by the Nordic countries?

What are the strategic options for the NDF?

Tenderers are given an open mandate regarding the design of the analytical framework, methodological approach and delimitations to fulfil the objective and overall aim with the study.

In relation to the OECD/DAC evaluation criteria (relevance, effectiveness, efficiency, impact, sustainability), the focus under (i) may be on issues of relevance and effectiveness. However, based on existing evaluations performed by NDF and its cooperation partners (to be provided by the EBA), the evaluation should also aspire to address the investments' impact and sustainability. To assess the second aim (ii), a scenario analysis may be considered.

However, tenderers are encouraged to let their expertise guide the choice of approach in answering the evaluation questions. We hope that this open task will be attractive and encourage innovation in submitted proposals.

Who is this evaluation for? Target group(s)

The main stakeholders are the NDF's Board of Directors and the Managing Director, the Nordic Council of Ministers, and the respective financing parties (the Nordic governments). Secondary target groups are NDF's cooperating partners (e.g. development cooperation agencies, DFIs, the private sector).

General structure and conditions

The proposal shall include a detailed analytical framework for the study proposed. While it is up to the evaluator to choose study design and methods, choices should be justified. The proposal shall be written in English.

The evaluator(s) shall deliver a report (in English) presenting the results from the study to be published in the EBA report series (www.eba.se/en/published-reports/). The evaluator(s) shall present the results at a meeting with the NDF Board of Directors as well as at a public dissemination event (details to be specified in consultation with the EBA at a later stage).

The EBA is managing this evaluation on behalf of the Nordic colleagues. The EBA works with 'dual independence'. This means that the EBA independently defines what issues to explore and which studies to commission. The content and the conclusion of each report is, however, the responsibility of the author(s).

The EBA will be the contracting authority for this evaluation. A joint Nordic review panel will select which applicants to invite to submit tenders; assess the submitted tenders; and suggest which tender to be awarded the contract by the EBA Committee.

A reference group will be set up for this study, consisting of experts in the field of study and representatives from the Evaluation Departments of all Nordic countries. The task of the reference group is to provide support and advice to the author(s) throughout the course of the working process in order to strengthen the quality of the report. While the reference group is thus required to contribute with comments and suggestions, it is within the evaluation team's purview to decide which ideas and suggestions they will consider, and the team is solely responsible for the content

of the report. Members of the reference group will assess compliance with the ToR and submit a final assessment of the quality of the report to the EBA Committee as a basis for its decision on publication. The reference group will be chaired by one of the members of the EBA Committee.

Procurement procedure and timetable

First stage: Application to submit tenders

All suppliers have the right to apply to submit tenders (expression of interest). The EBA will invite three (3) suppliers to submit tenders and may negotiate with one or more tenderers.

Selection of applicants to invite to submit tenders will be based on the team leader's CV and proven prior expertise in conducting similar evaluations and studies.

Applications to submit tenders shall be registered at the tender portal Kommers Annons eLite www.kommersannons.se/elite or sent to ud.eba@gov.se, no later than 4 September 2018. The application should contain:

1. CV of the team leader
2. A list of relevant evaluations and studies (including company references)

Suppliers shall submit an ESPD self-declaration by filling in the tender form at www.kommersannons.se/elite. Please allow time to complete the ESPD-form before submitting the expression of interest.

Second stage: Submission of tenders

The proposal should be no longer than 15 pages, including a presentation of the team, a detailed preliminary time table, allocation of time and functions within the team and budget (stated in SEK); excluding CVs and potential additional annexes. The timetable should include details regarding time used for each member of the project team.

Tenderers are expected to clearly disclose potential conflicts of interest among members in the evaluation team, and to provide a clear justification for the choice of including members that may be viewed as potentially partial.

The budget should accommodate 3–4 meetings with the reference group. If the team resides outside Sweden, some of the meetings could be conducted via video/skype/phone. The following timetable should be considered.

Tenders shall be registered at the tender portal Kommers Annons eLite www.kommersannons.se/elite or sent to ud.eba@gov.se, no later than 27 September 2018.

Timetable

Invitation to apply to submit tenders	20 August - 4 Sept 2018
Invitation to (3) suppliers to submit tenders	7 September 2018
Last day to submit tender	27 September 2018
Possible Negotiation	8-12 October 2018
Decision by the EBA	October 2018
Standstill period (10 days)	October 2018
Contract signed	October 2018
Presentation of conclusions to the NDF	31 May 2019

Final report delivered (the latest date possible to suggest in proposal) 15 August 2019

Proposals shall be valid until 31 December 2018.

During the submission process, the EBA is not permitted to discuss documentation, tenders, evaluation or other such matters with tenderers in a manner which favours or disfavours one or more tenderers.

Questions shall be posted on the Questions and Answers function on the tender portal Kommers Annons eLite, www.kommersannons.se/elite. Questions and answers to questions are published, anonymously and simultaneously, to anyone who have registered for the procurement.

Selection of proposals in the second stage

The following criteria will be used in the screening of proposals:

1. Quality of proposal, in terms of design, methods and plan for implementation. (Weight: 70%).

2. Experiences and qualifications of team members in the areas of 1) prior relevant evaluations and studies; 2) climate change adaptation and mitigation; 3) international investment/ corporate finance and international development finance; and 4) international development cooperation. Diversity in the composition of the evaluation team will be looked upon favourably. (Weight: 15 %).

3. Cost. (Weight: 15%).

See attached table for which factors will be considered under each of the three criteria. The assessment of each proposal will be based on the material submitted by the tenderer by the end of the bidding period. Negotiation may take place, but the EBA reserves the right to award the contract based on an original tender.

Confidentiality

After the communication of the EBA's selection, all submitted proposals will become official documents meaning that the Swedish principle of public access to official records applies. Sentences, sections or paragraphs in a document may be masked in the public version if "good reasons" (thorough motivations in terms of causing economic damage to the company) can be

provided and deemed valid. The tenderers are fully responsible for making their claims of confidentiality.

Background material

Policies and guidelines

NDF Agreement and Statutes, Nordic Development fund, 2011 (available at:

https://www.ndf.fi/legal-framework-policies-and-guidelines)

NDF Strategy, Agile and Innovative, NDF Looking Ahead, NDF, 2016 (available at:

https://www.ndf.fi/legal-framework-policies-and-guidelines)

The Swedish Public Procurement Act (2016:1145) (available at:

http://www.konkurrensverket.se/en/publications-and-decisions/swedish-public-procurement-act/)

Evaluations

Evaluation of NDF's Progress Under the Climate Mandate, Vista Analysis, 2 May, 2012 (available at:

https://www.ndf.fi/newsroom/publications)

(Additional evaluations and studies to be provided by the EBA)

About the Expert Group for Aid Studies (EBA)

The Expert Group for Aid Studies (EBA) is a government committee with a mandate to evaluate and analyse the direction, governance and implementation of Sweden's official development assistance with a specific focus on results and efficiency. The aim is to contribute to an efficient implementation of well-designed aid. The EBA focuses primarily on overarching issues within Swedish development assistance, not on individual projects. The EBA comprises an Expert group of ten members, and a secretariat placed in Stockholm.

In 2018 the Expert group consists of: Helena Lindholm (chair), Gun-Britt Andersson (vice chair), Arne Bigsten, Kim Forss, Torgny Holmgren, Eva Lithman, Johan Schaar, Julia Schalk, Fredrik Uggla, Camilla Goldbeck Löwe and Lennart Peck (appointed expert, MFA).

Assessment criteria

Criteria	1. Quality of proposal in terms of design, methods and plan for implementation. (Weight: 70%)	2. Experiences and qualifications of team members in the areas of interest. Diversity in the composition of the evaluation group will be looked upon favourably. (Weight: 15%)	3. Cost. (Weight: 15%)
Scale	Each criterion is graded on a scale of 0–5 (where 0 = not applicable, so effectively 1–5 is applied). Grade 5 = extraordinary or exceeds all expectations. Grade 1 = sub-standard. Grade 3 = fair, reasonable, in line with what can be expected. Each criterion is then weighted to obtain a final grade (the sum of the weighted grades) between 0 and 5.		
Specifications (numbered in	1. Does the study's design, i.e. approach, method, and implementation, make it	1. The project leader's experience of: a.	1. Total price in SEK 2. Price/hour

order of importance)	possible to answer the questions in the invitation for proposals? * 2. Will the study's design enable conclusions that can be expected to form the basis of use, learning and reflection among the evaluation's target groups? 3. Are proven and tested methods and forms of data collection to be used? 4. Have the approach and method(s) been described in a specific and transparent manner? 5. Are there any limitations with the method? 6. Level of innovation in design and method? * An overall assessment that the evaluation is feasible to implement and that it can be implemented without any ethical breaches occurring is presupposed. While such an appraisal is required, it is not included as a separate subcriterion.	Prior evaluations of similar kind b. Climate change adaptation and mitigation measures c. International investment/ corporate finance and international development finance d. International development cooperation 2. Complementarity of the team: Expertise in the team, beyond the project leader, that is particularly interesting in relation to the study and proposal (see area a-d above) 3. Team's diversity in terms of: a. Women/men b. Transnational collaboration c. Age * Sufficient language skills in relation to the needs of the assignment are required to be shown and are therefore not specified as a separate subcriterion.	3. Proportion of time (%) for project leader 4. Proportion of time (%) for research assistant or junior employee

Annex 2: Terms of References of the NCF Evaluation

TERMS OF REFERENCE

NORDIC CLIMATE FACILITY (NCF) EXTERNAL EVALUATION

1 Background to the Assignment

The Nordic Climate Facility (NCF) is a challenge fund set up and administered by the Nordic

Development Fund (NDF) to finance innovative climate change projects.

NCF has 5 key objectives: (i) increase low-income countries' capacity to mitigate and adapt to climate change; (ii) encourage and promote innovation in areas susceptible to climate change; (iii) build partnerships between Nordic and partner country actors, both private and public organisations; (iv) contribute to sustainable development and the reduction of poverty; and (v) leverage additional financing for climate action.

NCF provides between EUR 250,000 to 500,000 per project in grant financing for early-stage projects to facilitate the testing of innovative and climate-relevant business concepts. Financing is allocated on a competitive basis with calls for proposals arranged annually. Projects should be implemented through partnerships between Nordic and local actors in an eligible NCF country. In addition, the project partnership may entail other partners, i.e. not Nordic or local partners. Since

2009, eight calls for proposals have been organise and the portfolio comprises over 80 projects across Africa, Asia and Latin America.

NDF's board of directors have replenished NCF eight times. The last time NCF was replenished was in November 2016 when EUR 20 million was approved with the aim to organise and manage three more calls for proposals, i.e. NCF 7-9.

The Nordic Environment Finance Corporation (NEFCO) administered the first four NCF calls. NDF is administering call five and onwards.

For more information about NCF visit ndf.fi and nordicclimatefacility.com

2 Objective of the Evaluation

The overall objective of the evaluation is to provide NDF with an independent assessment of NCF as a facility. The evaluation of NCF has two connected aims. The first aim is to assess the performance of NCF in accordance with the objectives and outputs stated in the most recent NDF Board approval document of NCF 7-9, including assessment of the effectiveness and efficiency of the management of NCF. The second aim is to assess NCF's relevance and value-added as a challenge fund to NDF, and provide concrete recommendations for potential future directions and development of NCF, including but not limited to i) assessing the alternative of setting-up up NCF as a trust fund; ii) assessing the use of other types of financing than grants.

This evaluation will not evaluate the performance or development impact of individual NCF projects.

2.1 Target group

The main target group of the evaluation are NDF's Board of Directors and NDF's management. A joint Nordic evaluation of the NDF will be ongoing parallel to this evaluation. The findings from this NCF-focused external evaluation will feed into a discussion on NDF's future direction succeeding the overall NDF evaluation. The NCF external evaluation report will contribute to the decision- making regarding the continuation and development of NCF as a financing instrument under NDF. The secondary target group of the evaluation report are NDF's cooperating partners.

3 Methodology

The assignment is to be done as a desk study with interviews with relevant people. In the technical proposal, tenderers are requested to propose the analytical framework, evaluation methodology approach and delimitations to fulfil the objective of the evaluation.

NDF will provide all relevant documentation and information regarding NCF.

The evaluation team will report to Leena Klossner, Acting Managing Director of NDF.

4 Procurement process

The procurement method will be Single Stage Open Competitive Selection, whereby interested firms are invited to submit brief technical proposals and a financial proposal, along with the firm's and experts' qualifications.

The Request for Expressions of Interest (REOI) will be published along with these Terms of Reference. NDF will evaluate the submitted Expressions of Interest (EOI) as per the qualification criteria outlined in the REOI and establish a shortlist. The highest scoring firm on that shortlist will be invited to contract negotiations.

5 Qualifications

The evaluation team shall consist of a minimum of two experts, of which one is to be designated Team Leader. The experts shall have relevant experience in carrying out the assignment as per these Terms of Reference, for instance experience from conducting similar evaluations, managing challenge funds or other development projects/programmes. The evaluation team shall have professional skills in written and spoken English, and be able to produce well-written, clear and concise reports.

The selection criteria for evaluation the EOIs are outlined in the REOI.

6 Deliverables

One final draft evaluation report for commenting by NDF in an electronic format appropriate for reading in Microsoft Word or Adobe Reader.
One final evaluation report incorporating any comments made by NDF on the final draft evaluation report.
Two presentations on the results of the evaluation for NDF's Board of Directors as well as NDF's management

7 Duration of the assignment

The evaluation assignment shall commence mid-February 2019. The draft final evaluation report shall be submitted to NDF at the latest six weeks after the assignment has commenced. NDF will have two weeks to submit comments. A final report shall be submitted within two weeks after the

evaluation team has received NDF's comments. The evaluation team shall then present the final report first to NDF's management in Helsinki in May and then to NDF's Board of Directors in Sweden in June. The total duration of the assignment shall be no more than 10 weeks (excluding the presentations for which timing is to be agreed with NDF).

Annex 3: NDF Portfolio

The table shows parts of the portfolio data that Particip has been collecting.

NDF/NCF	Title (project/sub-project)	NDF Financing	Type	Start date (est.)	Categorisation
NDF	Increased access to modern energy [NDF C7]	1.500.000	grant	2010	Mitigation
NCF 1	NCF: Scaling the Solar Market Garden [NDF C3 B1]	415.000	grant	2010	Mixed
NDF	West Africa Coastal Areas Program (WACA) – Benin [NDF C108]	4.000.000	loan	2018	Adaptation
NCF 3	NCF: Ecological Food Processing Unit [NDF C3 D4]	340.488	grant	2013	Mixed
NCF 6	Promotion of solar PV cooling in Burkina Faso	402.352	grant	2017	Mixed
NCF 7	Digital Technology for Climate Change Adaptation For Burkina Faso Smallholders	500.000	grant	2018	Adaptation
NCF 1	NCF: Demand Side Management for Climate Change Adaptation for the Ethiopian Power Sector [NDF C3 B5]	407.300	grant	2010	Mixed
NCF 1	NCF: GHG Mitigation and Sustainable Development through the Promotion of Energy Efficient Cooking in Social Institutions in Ethiopia[NDF C3 B4]	212.000	grant	2010	Mitigation
NCF 2	NCF: Fuel from Waste: Demonstrating the Feasibility of Locally Produced Ethanol from Household Cooking in Addis Ababa [NDF C3 C3]	346.059	grant	2011	Mitigation
NCF 4	NCF: Clean energy promotion through microfinance in Ethiopia [NDF 62 B 1]	325.900	grant	2014	Mitigation
NCF 1	NCF: Energy Efficient Recycling of Electric and Electronic Scrap, E-Scrap [NDF C3 B7]	480.033	grant	2010	Mitigation
NCF 1	NCF: Climate-Proofed Water Conservation Strategies in Northern Ghana [NDF C3 B6]	44.005	grant	2010	Adaptation
NCF 3	NCF: Rain Water Harvesting (RWH) for Resilience to Climate Change Impact on Water Availability in Ghana [NDF C3 D9]	330.199	grant	2012	Adaptation
NCF 3	NCF: Pilot Project: Efficiency Enhancement and Entrepreneurship Development in Sustainable Biomass Charcoaling in Ghana [NDF C3 D8]	499.998	grant	2013	Mixed
NCF 3	NCF: Biomass Green Briquette Fuel (GBF) Production (BidiePa) under Kitchen Efficiency Programme [NDF C3 D7]	494.790	grant	2013	Mixed
NCF 1	NCF: Providing Assistance for Design and Management of Appropriate Water Harvesting Technologies in Arid Lands [NDF C3 B10]	500.000	grant	2010	Adaptation
NCF 1	NCF: Building Adaptive Capacity to Climate Change [NDF C3 B9]	496.750	grant	2010	Adaptation
NCF 1	NCF: Community Based Adaptation to Climate Change through Environmentally	391.447	grant	2010	Mixed

NDF/NCF	Title (project/sub-project)	NDF Financing	Type	Start date (est.)	Categorisation
	Sustainable Water Resources Management in Isiolo District [NDF C3 B8]				
NCF 1	NCF: Enhancing Capacity for Adaptation to, and Mitigation of, Climate Change in Kibera, Nairobi [NDF C3 B11]	301.290	grant	2010	Mixed
NCF 1	NCF: Mount Elgon Integrated Watershed Management Project [NDF C3 B12]	227.751	grant	2010	Adaptation
NDF	Off-grid Electrification Using Wind and Solar Energy in Kenya [NDF C24]	4.000.000	grant	2012	Mitigation
NDF	Training in Geothermal Drilling Operations [NDF C41]	1.500.000	grant	2012	Adaptation
NCF 3	NCF: Business Development Closing the Rural-Urban Nutrient and Carbon Dioxide Cycles [NDF C3 D10]	199.396	grant	2013	Mitigation
NCF 4	NCF: Improved Water Economics in Sub-catchments of Kenya (IWESK) [NDF C62 B 5]	390.717	grant	2014	Adaptation
NCF 4	NCF: Leveraging Markets for Climate Friendly Sustainable Development, in Laikipia, Kenya [NDF C4 49/13]	468.201	grant	2015	Mixed
NCF 4	NCF: Creating Green Local Economy through Commercial Production of Biomass Briquettes from Agro-Industrial Residues in Kenya – "Green Economy Partnership" (GEP) [NDF C62 B 4]	451.908	grant	2015	Mitigation
NCF 4	NCF: Climate Smart Agriculture for Improved Rural Livelihoods [NDF C62 B 3]	300.000	grant	2015	Mixed
NCF 5	NCF: Climate Resilient Low Cost Buildings in Marsabit County, Kenya [NDF C82 B3]	497.660	grant	2017	Mixed
NCF 7	Greening Tea Factories in Kenya: Using Absolicon Solar Collectors in Tea Process	500.000	grant	2018	Mitigation
NDF	Kenya-Nordic Green Hub [NDF C112]	500.000	grant	2018	Mixed
NCF 7	A New Cookstove and Fuel for East Africa's Under-served Small Businesses	494.297	grant	2018	Mitigation
NCF 2	NCF: Strengthening the Resilience of People Living in High Risk Urban and Semi-Urban Areas to weather-related disasters [NDF C3 C4]	499.500	grant	2011	Adaptation
NCF 3	NCF: Mainstreaming Climate-Smart Agriculture in Solar Irrigation Schemes for Sustainable Local Business Development in Malawi [NDF C3 D12]	279.316	grant	2013	Mixed
NCF 7	NCF 7: Solar Housing Systems for Malawian Farmers	382.851	grant	2018	Mitigation
NCF 2	NCF: Increasing climate resilience in Maputo – GIS tool for urban adaptation to climate change and flood risk [C3 C5]	499.236	grant	2011	Adaptation
NDF	Coastal Cities and Climate Change Project [NDF C36]	3.800.000	grant	2012	Adaptation
NDF	Transforming Hydro-Meteorological Services [NDF C44]	4.500.000	grant	2013	Adaptation
NDF	Fisheries and Climate Change Project [NDF C50]	4.000.000	grant	2014	Adaptation

NDF/NCF	Title (project/sub-project)	NDF Financing	Type	Start date (est.)	Categorisation
NDF	Developing Capacity for a Climate Resilient Road Sector [NDF C59]	3.800.000	grant	2014	Adaptation
NCF 4	Waste recycling in Mozambique through the establishment of Waste Transfer and Recycling Centres: Testing concept and formulation of bottom-up NAMA [NDF C62 B7]	500.000	grant	2015	Mitigation
NDF	Aquaculture and Climate Change [NDF C72]	5.000.000	grant	2016	Mixed
NCF 6	Climate Friendly Cold Storage for Artisanal Fisheries	500.000	grant	2017	Adaptation
NCF 1	NCF: Fuel Efficient Stoves in East Africa: Reducing Emissions and Improving Livelihoods [NDF C3 B3]	343.842	grant	2010	Mitigation
NDF	Addressing the Vulnerability of Infrastructure [NDF C28]	600.000	grant	2011	Adaptation
NCF 2	NCF: Enhancing Sustainable Energy Supply for Tea Factories [NDF C3 C7]	280.000	grant	2011	Mitigation
NDF	Insurance Instruments for Climate Adaptation [NDF C31]	500.000	grant	2012	Adaptation
NDF	Geothermal Exploration Project [NDF C48]	5.000.000	grant	2013	Mitigation
NDF	Sub-Saharan Drylands – Towards enhanced resilience [NDF C37]	492.479	grant	2013	Adaptation
NCF 3	NCF: ADAPTea: Climate Change Adaptation for FAIRTRADE Tea Producers in East Africa [NDF C3 D11]	444.936	grant	2013	Adaptation
NDF	African Water Facility – Call for Proposals for Preparation of Water and Climate Change Investment Programmes and Projects [NDF C69]	6.000.000	grant	2014	Mixed
NDF	ClimDev Special Fund [NDF C64]	5.000.000	grant	2014	Mixed
NDF	Climate Change and Health [NDF C74]	487.355	grant	2014	Adaptation
NDF	West Africa Coastal Area Erosion and Adaptation [NDF C77]	500.000	grant	2015	Adaptation
NDF	African Guarantee Fund Green Guarantee Facility [NDF C88]	17.850.000	equity& grant	2016	Mixed
NDF	responsAbility Renewable Energy Holding Company (rAREH) [NDF C99]	7.500.000	equity& grant	2017	Mitigation
NDF	Africa Climate Resilient Investment Facility (AFRI-RES) [NDF C91]	5.000.000	grant	2017	Adaptation
NDF	Lake Victoria Basin Resource Efficiency and Cleaner Production	4.000.000	grant	2017	Mixed
NDF	Off Grid Energy Access Fund Preparation Facility [NDF C102]	300.000	grant	2017	Mitigation
NDF	Energy and Environment Partnership Trust Fund [NDF C104]	10.000.000	grant	2018	Mitigation
NDF	Facility for Energy Inclusion Off-Grid Energy Access Fund (FEI OGEF) [NDF C103]	6.500.000	equity&grant	2018	Mitigation
NDF	West Africa Coastal Areas Program (WACA) – Regional Africa [NDF C109]	5.100.000	grant/loan	2018	Adaptation
NDF	Urban & Municipal Development Fund for Africa [NDF C100]	4.000.000	grant	2018	Mixed

NDF/NCF	Title (project/sub-project)	NDF Financing	Type	Start date (est.)	Categorisation
NDF	Climate Change and Fisheries in Africa [NDF C70]	500.000	grant	2018	Adaptation
NDF	Investment subsidies for solar water heaters [NDF C4]	4.000.000	grant	2010	Mitigation
NCF 2	NCF: Karisimbi Geothermal Prospect [NDF C3 C8]	449.584	grant	2011	Mitigation
NDF	Developing capacity for climate resilient road transport infrastructure [NDF C79]	4.400.000	grant	2016	Adaptation
NDF	Improving charcoal value chain [NDF C95]	3.700.000	grant	2017	Mixed
NCF 6	NCF: Promoting Sustainable Agriculture in a Changing Climate in Bugesera District	500.000	grant	2017	Mixed
NDF	Water and sanitation millennium project (PEPAM) [NDF C11]	4.000.000	grant	2010	Mixed
NDF	Sustainable and Participatory Energy Management Project (PROGEDE II) [NDF C14]	3.000.000	grant	2010	Mitigation
NDF	Transport and Urban Mobility Project (STUMP) [NDF C10]	0	grant	2011	
NDF	Flood Risk Management (PROGEP) [NDF C33]	7.000.000	grant	2012	Adaptation
NCF 4	NCF: Piloting REDD+ Monitoring and Non-Wood Forest Product Value Chains to Mitigate Green House Gas Emissions in the Rural Communities of Bandafassi [NDF C62 B 8]	450.000	grant	2015	Mixed
NDF	West Africa Coastal Areas Program (WACA) – Senegal [NDF C107]	4.000.000	loan	2018	Adaptation
NDF	Impacts of Climate Change on Coastal Areas [NDF C29]	759.581	grant	2012	Adaptation
NDF	Hydropower Sustainability Assessment [NDF C45]	500.000	grant	2013	Mitigation
NCF 3	NCF: From Waste to Local Business Development and Vigorous Soil [NDF C3 D14]	310.171	grant	2013	Mixed
NCF 3	NCF: Sustainable Charcoal Business Development in Tanzania [NDF C3 D15]	259.250	grant	2013	Mitigation
NDF	Kikuletwa Power Station and Hydropower Training Centre [NDF C101]	500.000	grant	2014	Mitigation
NDF	Climate Smart Solutions for Small-scale Water and Energy Supply [NDF C49]	500.000	grant	2014	Mixed
NCF 4	NCF: Reduction of greenhouse gases and deforestation related to food processing in sub-Sahara Africa [NDF C62 B 9]	488.903	grant	2014	Mixed
NDF	Dar es Salaam Metropolitan Development Project – Institutional Strengthening for Urban Climate Adaptation and Mitigation [NDF C71]	5.000.000	grant	2015	Mixed
NDF	Increasing access to modern energy packages in rural areas [NDF C2]	2.819.763	grant	2009	Mitigation
NCF 1	NCF: The Bukaleba Charcoal Project [NDF C3 B14]	220.000	grant	2010	Mixed
NCF 2	NCF: Sustainable Renewable Energy Businesses in Uganda [NDF C3 C10]	500.000	grant	2011	Mitigation

NDF/NCF	Title (project/sub-project)	NDF Financing	Type	Start date (est.)	Categorisation
NDF	The Farm Income Enhancement and Forest Conservation Project 2 (FIEFOC 2)[NDF C87]	5.250.000	grant	2015	Mixed
NCF 4	NCF: Sustainable consumption and production of biofuel in Uganda [NDF C62 B 11]	238.000	grant	2015	Mitigation
NCF 4	NCF: 3Ws Innovative Water Solutions [NDF C62 B 10]	0	grant	2015	Mixed
NCF 6	NCF 6: Improving climate resilience for small-scale coffee farming systems in Uganda through modeling of adaptation and mitigation potential in the coffee value chain	499.886	grant	2016	Mixed
NCF 6	NCF 6: Growing Resilient Agricultural Enterprises (GREAN) in Uganda	500.000	grant	2017	Mixed
NCF 6	NCF 6: Climate resilience and diversification of livelihoods in Northern Uganda	500.000	grant	2017	Mixed
NDF	Strengthening Climate Resilience Project – Developing Climate Resilient Infrastructure Standards [NDF C52]	4.000.000	grant	2015	Adaptation
NDF	Climate Resilient Rural Water Supply and Sanitation [NDF C76]	2.250.000	grant	2016	Adaptation
NCF 7	NDF 7: Solar solutions for African smallholder farmers	500.000	grant	2018	Mixed
NCF 7	Testing biochar-pigeon pea agroforestry businesses in Zambia (ClimChar Zambia)	498.611	grant	2018	Mixed
NCF 3	NCF: NAMA and Innovative Energy Optimisation in the Steel Sector in Bangladesh [NDF C3 D1]	288.166	grant	2013	Mitigation
NDF	NAMA Proposal for the Railway Sector in Bangladesh [NDF C73]	300.000	grant	2014	Mitigation
NCF 5	NCF: Community Driven Climate Adaptation – Making Sustainable Climate Adaptation Solutions Accessible to the Urban Poor [NDF C82 B1]	399.260	grant	2016	Adaptation
NCF 7	NCF 7: JutePP -the sustainable material for plastic products	250.000	grant	2018	Mixed
NDF	Adaptation Approaches for the Transport Sector [NDF C15]	3.768.440	grant	2011	Adaptation
NDF	Water Resources Management Project (WRMP) [NDF C19]	1.971.936	grant	2011	Adaptation
NCF 3	NCF: Cambodian Farmland Carbon (CAFACA) Project [NDF C3 D5]	383.386	grant	2013	Mixed
NDF	Rural Roads Improvement Project II (RRIP II) [NDF C63]	4.000.000	grant	2014	Adaptation
NDF	Integrating Gender Considerations in Climate Change Adaptation [NDF C84]	500.000	grant	2016	Adaptation
NDF	Monitoring, Reporting and Evaluation of Adaptation Investments [NDF C85]	450.000	grant	2016	Adaptation
NCF 7	NCF 7: Shifting the Market to Clean and Efficient Stoves and Fuels	499.450	grant	2018	Mitigation
NDF	Pakse urban environment improvement project [NDF C5]	298.099	grant	2009	Mixed

NDF/NCF	Title (project/sub-project)	NDF Financing	Type	Start date (est.)	Categorisation
NDF	Capacity enhancement for coping with climate change [NDF C8]	1.989.976	grant	2010	Adaptation
NDF	Lao PDR Road Sector Project II [NDF C92/C93]	11.000.000	grant/loan	2016	Adaptation
NDF	National Road 13 North – Lao PDR – [NDF C110]	8.000.000	loan	2018	Adaptation
NCF 6	Encouraging Climate Adatation and Mitigation Investments Private Sector Engagement in Decentralised Wastewater Treatment Systems (DEWATS) and Small-scale Water Infrastructure in Laos	489.138	grant	2018	Mixed
NCF 2	NCF: Promoting Renewable Energy Technologies for Enhanced Rural Livelihoods [NDF C3 C6]	341.506	grant	2011	Mixed
NDF	Pilot Project to Test the Climate Change Benefits of Biochar [NDF C55]	395.000	grant	2013	Mixed
NCF 3	NCF: Developing Low-Cost, Community-Based Innovative Solutions to Mitigate and Adapt with Climate Change while Creating Viable Local Business Solutions [NDF C3 D13]	360.565	grant	2013	Mixed
NDF	Building Climate Resilience of Watersheds in Mountain Eco-Regions (BCRWME) [NDF C56]	3.600.000	grant	2014	Adaptation
NCF 5	NCF: Building Resilience and Climate Adaptive Planning in Urban Centres of Nepal [NDF C82 B4]	460.299	grant	2016	Adaptation
NCF 6	NCF 6: Reducing vulnerability to climate change in rural Nepal by supporting local business development based on forest-land-management renewable energy initiatives	354.075	grant	2017	Mixed
NCF 7	New and Affordable Building Materials Promoting Sustainability in Nepal (NABIN)	450.000	grant	2018	Mitigation
NCF 5	NCF: Introducing Renewable Energy Solutions to Enhance Energy Security and Build Climate Resilience in Karachi, Sindh, Pakistan [NDF C82 B5]	492.636	grant	2016	Mixed
NDF	Energy and Environment Partnership (EEP) [NDF C1]	2.999.720	grant	2009	Mixed
NDF	Climate-friendly Bioenergy [NDF C21]	2.344.458	grant	2011	Mitigation
NDF	Gender and Climate Change [NDF C26]	2.052.043	grant	2011	Mitigation
NDF	Adapting Cities to Climate Change [NDF C42]	444.076	grant	2012	Adaptation
NDF	GMS Climate Resilience and Low Carbon Strategies [NDF C54]	4.000.000	grant	2013	Mixed
NCF 3	NCF: Scaling Up Low Carbon Household Water Purification Technologies in the Mekong Sub Region [NDF C3 D6]	439.095	grant	2013	Mitigation
NDF	Improving Nitrogen-use Efficiency for Climate Change Mitigation in the GMS [NDF C57]	3.700.000	grant	2014	Mitigation

NDF/NCF	Title (project/sub-project)	NDF Financing	Type	Start date (est.)	Categorisation
NDF	Strengthening Resilience to Climate Change in the Health Sector in Mekong [NDF C65]	4.000.000	grant	2015	Adaptation
NDF	Transport NAMA Support Facility [NDF C66]	419.646	grant	2015	Mitigation
NDF	ADB Project Readiness Improvement Fund [NDF C90]	7.000.000	grant	2016	Mixed
NDF	Enhancing Readiness of ADB Developing Member Countries for Scaled Up Finance [NDF C89]	500.000	grant	2016	Mixed
NCF 2	NCF: Climate Resilient Action Plans for Coastal Urban Areas [NDF C3 C9]	378.308	grant	2011	Adaptation
NCF 7	Innovative business models and tools for building climate resilience of SMEs	499.982	grant	2018	Adaptation
NDF	Support for the National Target Program on Climate Change [NDF C18]	1.859.446	grant	2010	Mixed
NCF 2	NCF: Adapting Urban Construction Plans to Climate Change in Vietnam by the use of Strategic Environmental Assessment [NDF C3 C11]	468.131	grant	2011	Adaptation
NCF 2	NCF: Building technology in urban flood & inundation forecasting to be applied for an operational early warning system in the Ha Noi City [NDF C3 C12]	324.950	grant	2011	Adaptation
NDF	Nordic Partnership Initiative Pilot Programme [NDF C34]	1.389.792	grant	2012	Mitigation
NDF	Integrating Climate Change Adaptation to Transport [NDF C25]	416.168	grant	2012	Adaptation
NDF	Innovative and Climate Resilient Housing in the Mekong Delta [NDF C67]	500.000	grant	2014	Adaptation
NCF 5	NCF: Implementing Incentives for Climate Resilient Housing Among the Urban Poor in Vietnam [NDF C82 B8]	498.450	grant	2016	Adaptation
NCF 5	NCF: Exploiting the Synergies between Sustainable Urban Drainage Systems (SUDS) and Urban Farming in Vinh Yen City, Vietnam [NDF C82 B7]	480.000	grant	2016	Adaptation
NCF 6	NCF 6: Improving rural livelihoods in the North Central region in Vietnam through innovative development of supply chains for energy-efficient cook stoves and wood from sustainable sources	399.914	grant	2017	Mitigation
NCF 7	Reducing the negative impact of flooding on the Vietnamese society	499.391	grant	2018	Adaptation
NCF 7	Improved business through seasonal forecasting for coffee in Vietnam	449.999	grant	2018	Mixed
NCF 1	NCF: Adapting to Climate Change in Bolivian Andean Communities Depending on Tropical Glaciers [NDF C3 B2]	496.951	grant	2010	Adaptation
NCF 2	NCF: Financing Sustainable Energy Through Remittances Flows[NDF C3 C1]	476.246	grant	2011	Mitigation
NCF 2	NCF: Urban and Industrial Waste to Energy-Promoting Sustainable Energy in Bolivia [NDF C3 C2]	440.627	grant	2011	Mitigation

NDF/NCF	Title (project/sub-project)	NDF Financing	Type	Start date (est.)	Categorisation
NDF	Rural Electrification with Renewable Energy [NDF C47]	4.000.000	grant	2013	Mitigation
NCF 3	NCF: Promoting Cañahua in the Extreme Climatic Conditions of the Bolivian Altiplano: A Highly Nutritive Crop with Tolerance to the Effects of Climate Change [NDF C3 D3]	269.952	grant	2013	Adaptation
NDF	Pilot Adaptation Plan of Action for High Inter-Valley Communities [NDF C46]	4.000.000	grant	2014	Adaptation
NCF 5	NCF: Technology, adaptation and mitigation: Greening the economy of urban agriculture at Kanata metropolitan area, Bolivia [NDF C82 B2]	499.996	grant	2016	Mixed
NCF 6	NCF 6: Increased resilience to climate change through enhanced local green growth development in Bolivia	500.000	grant	2017	Mixed
NCF 6	NCF 6: Indigenous Forest Management for Climate Change Mitigation and Adaptation in Northern La Paz, Bolivia	410.000	grant	2017	Mixed
NCF 7	NDF 7: Using Effective Beneficial Microorganisms to Mitigate GHG emissions and Build Resilient Farming Systems in Bolivia	494.682	grant	2018	Mixed
NDF	Indigenous Peoples, Renewable Energy and Climate Change [NDF C20]	3.500.000	grant	2012	Mixed
NDF	Renewable Energy in the Bay Islands [NDF C75]	500.000	grant	2014	Mitigation
NDF	Adaptation to Climate Change in Poor Neighbourhoods of Tegucigalpa [NDF C60]	240.000	grant	2014	Adaptation
NDF	Resilience of the Blue Economy and the Coastal Ecosystem in Northern Honduras—MIPESCA [NDF C61]	3.100.000	grant	2016	Adaptation
NDF	Sustainable Electrification and Renewable Energy Programme [NDF C12]	4.500.000	grant	2010	Mixed
NCF 1	NCF: Strenghtening National Capacities on Energy Efficiency in Nicaragua [NDF C3 B13]	381.046	grant	2010	Mitigation
NDF	Disaster Management and Climate Change Project [NDF C17]	2.486.139	grant	2011	Adaptation
NDF	Road Sector Support Program: Developing Adaptive Capacity for Climate Change [NDF C32]	4.400.000	grant	2012	Adaptation
NDF	Biogas Technology Development Programme [NDF C38]	1.500.000	grant	2012	Mitigation
NDF	Promoting energy savings insurance [NDF C97]	480.000	grant	2017	Mitigation
NDF	GREENPYME I – (C13)	2.200.000	grant	2010	Mitigation
NDF	Regional Microfinance and Climate Change Program (C35)	1.500.000	grant	2011	Mixed
NDF	Climate Proofing and Review of Infrastructure Investments (C27)	1.500.000	grant	2011	Adaptation
NDF	Adaptation to Climate Change in Honduras and Nicaragua (C30)	496.991	grant	2011	Adaptation

NDF/NCF	Title (project/sub-project)	NDF Financing	Type	Start date (est.)	Categorisation
NDF	GREENPYME II – Increasing Energy Efficiency in Small and Medium-sized Enterprises [NDF C39]	3.000.000	grant	2012	Mitigation
NDF	Climate Change and Sustainable Cities (C40)	2.100.000	grant	2012	Mixed
NDF	Regional Geothermal Training Programme (C16)	1.469.834	grant	2012	Mitigation
NDF	Energy Efficiency Technical Assistance Guarantee Fund (C9)	8.164.078	grant	2013	Mitigation
NDF	PROADAPT Building Climate Resilience in MSMEs in Latin America and the Caribbean [NDF C51]	3.500.000	grant	2013	Adaptation
NDF	Economics of Climate Change Study [NDF C23]	435.708	grant	2013	Mitigation
NDF	IDEAS – Energy Innovation Contest [NDF C58]	167.658	grant	2013	Mitigation
NDF	Emerging and Sustainable Cities Initiative (ESCI) II [NDF C68]	4.000.000	grant	2014	Mixed
NDF	The Climate-Smart Agriculture Fund for Latin America and the Caribbean (CSAF) [NDF C86]	5.000.000	grant	2015	Adaptation
NDF	Green Climate Fund Readiness Support for Central America and Bolivia [NDF C80]	500.000	grant	2015	Mixed
NCF 4	NCF: Roadmap to Nationally Appropriate Mitigation Actions in the Livestock Sector of Honduras and Nicaragua [NDF C62 B 2]	280.219	grant	2015	Mitigation
NDF	EcoMicro 2.0 [NDF C78]	4.100.000	grant	2016	Mixed
NDF	NDC Pipeline Accelerator [NDF C98]	10.000.000	grant	2017	Mixed
NDF	Cloud Forest Blue Energy Mechanism	300.000	grant	2019	Mixed
NDF	Social Analysis and Adaptation to Climate Change (C43)	178.457	grant	2012	Adaptation
NDF	Market for Climate Resilience in Latin America, Africa and Asia [NDF C81]	500.000	grant	2015	Adaptation
NDF	Climate Investor Fund, Development Fund	5.000.000	Reimbursable grant	2018	Mitigation
NDF	Climate Resilience and Adaptation Finance Technology Transfer Facility (CRAFT) Prep facility	500.000	grant	2018	Adaptation
NDF	Climate Resilience and Adaptation Finance Technology Transfer Facility (CRAFT)	10.000.000	equity&grant	2019	Adaptation

Annex 4: Evaluation Matrix

Overarching question	Sub-question	Indicators	Methods/tools	Strand 1	Strand 2	Strand 3
Q1. Has the NDF delivered on its mandate?	1.1 Has NDF steering facilitated the delivery of its mandate?	• Internal and external perceptions of steering effectiveness • Comparison of key elements of effectiveness to benchmarks/other funds if possible	• Interviews			
	1.2 To what extent have NDF's financing instruments and approach helped address poverty reduction and climate change challenges in an integrated way, coupling this with an ability to absorb high risks and promote innovation and private sector development?	• Project identification/ screening respects the pre-identified criteria	• Data/document review • Interviews			
	1.3 Have NDF contributions been rooted in partners' priorities, especially priorities of NDF's Nordic owners?	• Partner-reports on their needs • Partner reports on the extent to which their priorities have been met	• Document review • Interviews • Case studies			
	1.4 To what extent has NDF contributed to outcomes related to poverty reduction and the development of low-carbon societies more resilient to climate change, while promoting gender equality (as set out in the ToC)?	• Observed and perceived changes in outcomes as specified in ToC	• Data/document review • Case studies			
Q2. What is the current value added of NDF in an international perspective?	2.1 Are the NDF's contributions additional/ complementary to those of co-financing partners and other actors (e.g. the MDBs and climate funds)? Specifically, do they play a niche role as a flexible funder?	• Partner -reports of NDF in terms of a) niche role and b) flexibility • Partners-reports on the likelihood that investments would have happened without NDF • Need for NDF financing within global finance architecture	• Case studies • Interviews • Climate finance mapping			

Overarching question	Sub-question	Indicators	Methods/tools	Strand 1	Strand 2	Strand 3
	2.2. Do NDF investments have a catalytic effect on other funders i.e. what evidence is there that they leverage other funds?	• Partner-reports on role played by NDF • Value of funds leveraged	• Interviews • Case studies			
	2.3. What are NDF experiences of working with the private sector, how do these compare with traditional investors and how should this relationship evolve?	• NDF/PS reports on working together • Partner-reports on role played by NDF	• Interviews • Case studies			
	2.4. Does NDF create a "Nordic value added"[1] and how clear is the 'Nordic value added' to the partners and Nordic stakeholders?	• Internal/external stakeholder reports on Nordic value added	• Case studies • Data/document review • Interviews			
	2.5. What is the contribution of NDF to the international climate architecture?	• External stakeholder reports on contribution of NDF to climate architecture	• Case studies • Interviews • Climate finance mapping			

The table below presents the questions and sub-questions related to the second aim of the evaluation alongside the indicators and proposed methods/tools to answer them.

Overarching question	Sub-question	Indicators	Methods/tools
Q3. What should key priorities be to further strengthen NDF's added value and comparative advantage in the international climate financing architecture?	3.1. Assuming there is evidence that outcomes are being achieved, do the current results motivate new replenishments?	• Impact evidence • Partner reports on NDF contribution • Nordic owner reports	• Case studies • Interviews • Climate finance mapping
Q4. Should the NDF play a different or wider role on behalf of the Nordic administrations, either through a broader climate change and development mandate or in other areas prioritised by the Nordic countries?	3.2. What are the strategic options for the NDF? In particular, what is the optimum range of financing instruments that NDF should use in the future?	• N/A	• Synthesis of all evaluation activities

[1] as defined in section 2 of the NDF Strategy (2016).

Annex 5: Consistency with OECD-DAC principles for evaluation of development assistance

The OECD-DAC principles, introduced in their earliest form already in 1991, have been a compass for evaluation efforts of development assistance ever since. Therefore, it is only natural that they also serve as guidelines for this evaluation and we have detailed out our approach to complying with the three main principles (impartiality and independence, credibility and usefulness) in the table below.

Table 1 Measures taken in the NDF evaluation to comply with the OECD-DAC principles

OECD-DAC Principles	How the NDF evaluation complies with OECD-DAC principles
Impartiality and independence	The evaluation is channelled through the Expert Group for Aid Studies (EBA), an independent government committee mandated to study the direction, governance and implementation of Sweden's official development assistance (ODA). It is joined in this evaluation by the Evaluation Departments of other relevant Nordic Development Cooperation Agencies (MFAs from Norway, Denmark, Finland and Iceland). The contractor (Particip) has been selected through a competitive bid. The evaluation team members are external experts who have no conflict of interest with the NDF or EBA. They have been chosen against predefined criteria and approved by EBA.
Credibility	The evaluation team consists of skilled, independent professionals. Expertise is provided on all competencies required by the Terms of Reference: i) prior relevant evaluations and studies; ii) climate change adaptation and mitigation; iii) international investment/corporate finance and international development finance; and iv) international development cooperation. The quality of deliverables is ensured through the following steps: evaluation team members review each other's work prior to the submission of the deliverables into further quality assurance (QA) process assured by Particip. The Evaluation Manager at EBA provides close follow up to the team during implementation for external review mechanism. The evaluation is based on evidence using mixed methods (both qualitative and quantitative). Limitations of the study will be explained in a transparent manner in the evaluation report.
Usefulness	The usefulness of this evaluation is paramount. This is evident in the overall design, research process and communications plan. First, the inclusion of ex-post and appraisal phases ensures that the future NDF strategy can be directly informed by evaluation findings. To that end, the report will include a table of findings, conclusions, and recommendations which EBA/NDF can draw upon when formulating its response. In addition, the evaluation timeframe is closely aligned with NDF's policy planning and decisions schedule to ensure results are available to decision-makers in a timely fashion. Second, the methodology includes a stakeholder analysis based on which relevant actors will be identified for individual or group consultations. Third, the evaluation team is highly experienced in development evaluation, including evaluations of Development Finance Institutions (DFIs) and the use of OECD-DAC criteria in evaluation. Finally, conclusions and recommendations will be presented in a seminar to NDF management and board of directors.

Assuring quality of the evaluation process and its outputs is also key to complying with these principles. In addition to the EBA evaluation manager as an external review mechanism, Particip has put in place a sound quality management system. Effective quality control ensures an impartial and rigorous evaluation which complies with the ToR requirements and the highest professional standards. It contributes to improving the quality of outputs and their utility for users and plays a

key role in enhancing stakeholder engagement. Our quality control for evaluations is embedded into Particip's working practices, which follow guidance from the DAC Evaluation Quality Standards. Particip is a member of the Global Compact and employs all the UN and DAC ethical standards. These are set down in Particip's own internal Code of Conduct[2]. To ensure high efficiency of all relevant working processes and their continuous improvement, Particip has adopted a quality management system which was certified according to DIN EN ISO 9001:2008.

Evaluations based on OECD-DAC principles typically follow the evaluation criteria of relevance, effectiveness, efficiency, impact and sustainability. Further developed approaches (mostly within EU context) also include the criteria of coherence and added value. Evaluation reports are often structured around these elements. In this evaluation, however, overarching questions and related sub-questions have from the start (already in the ToR) transcended these criteria, in the sense that several criteria are treated within a single question. We welcome this approach as a more appropriate and useful way to structure data and ultimately our findings will be presented accordingly in the final report. On a larger scale, this also reflects well the attribution of evaluation questions to the two main dimensions – post-hoc assessment and forward-looking appraisal – of the evaluation.

The OECD-DAC criteria will thus be used mainly as an analytical tool and applied as an overall framework in the background of the study. As we can see in the table below, the evaluation questions provide good coverage of the criteria and should enable us, where data permits, to address each with respect to NDF's work.

Table 2 Summary of the evaluation matrix per OECD DAC criteria

Evaluation aim	Overarching evaluation question	OECD DAC Criteria
Post-hoc assessment	Has the NDF delivered on its mandate?	Effectiveness Efficiency Relevance Impact
	What is the current value added of NDF in an international perspective?	Coherence Added value
Forward-looking appraisal	What should key priorities be to further strengthen NDF's added value and comparative advantage in the international climate financing architecture?	Added value Sustainability
	Should the NDF play a different or wider role on behalf of the Nordic administrations, either through a broader climate change and development mandate or in other areas prioritised by the Nordic countries?	All the above

[2] See also Particip's website: http://www.particip.de/company/principles/

Annex 6: Stakeholder mapping

Stakeholder	Level of value/ interest	Level of influence	Rationale
Core stakeholders: directly involved in the fund design and strategic management			
NDF Board of Directors	4	4	The board helps develop the fund strategy, The Board of Directors makes policy decisions in matters that involve operations and administrative questions. The Board of Directors approves the financing transactions proposed by the Managing Director.
Nordic MFAs	4	4	Sets the mandate and financing arrangements
Control Committee	3	3	The Control Committee ensures that the Fund's operations are conducted in accordance with its Statutes and is responsible for the financial audit of the Fund. The audit of the Fund is carried out by professional auditors appointed by the Control Committee.
Nordic Council	3	3	Appoints members of the Control Committee and has to approve the annual auditor's report presented by the Control Committee
Nordic Council of Ministers	3	3	Appoints the Chairman of the Control Committee; is the forum for Nordic governmental cooperation. The Ministers of Cooperation have the overall responsibility for Nordic cooperation. Denmark, Finland, Iceland, Norway and Sweden and the autonomous territories—the Faroe Islands, Greenland and Åland—are represented in the Nordic Council of Ministers.
NDF employees	4	4	Interpret and implement the mandate
Connected stakeholders: directly involved/engaged in project implementation			
Co-financing partners	3	3	NDF rarely finances projects alone, NDF provides co-financing on concessional terms with its multilateral and bilateral partners
Collaborators	3	3	These include co-financiers but also include groups like universities, NGOs, businesses
Local partner organisations	3	1	In-country partners involved in project delivery
In-country governments	3	1	These are sometimes beneficiaries e.g. via capacity building but will always have an important stake in the outcomes
Direct beneficiaries	4	1	National governments, local partners, businesses, employees and communities
Indirect beneficiaries	4	1	Affected communities not directly involved in the project
External stakeholders: indirectly involved in fund activities or interested in the outcome of the fund/projects			
Society	2	2	Nordic society as the ultimate owners of NDF are important for the legitimacy of NDF
Sister organisations	2	2	Nordic Investment Bank (NIB) and Nordic Environment Finance Corporation (NEFCO). NDF uses NIB's office space and have been directed by their Board to explore more ways of working together, synergies, complementarities etc.
Other Nordic institutions	2	1	Nordic institutions that are potential collaborators/competitors (e.g. Swedbank)
Competitors	2	1	Collaborators and partners are also competitors for funds and for 'good projects'
Media	1	2	Nordic, in-country and international
INGOs/ donors	1	1	International development organisations working in the same field

Stakeholder	Level of value/ interest	Level of influence	Rationale
Climate finance institutions	2	2	International organisations working on climate finance

While not included here, perhaps the most important 'stakeholder' for NDF is the **natural environment**. NDF's primary purpose is to support the mitigation of, and adaptation to, climate change.

Annex 7: Case study selection

We conducted six case studies in total. These were selected in the following steps:

Step 1: Clustering

Projects were clustered according to financial instruments, each of which has its own implicit theory of additionality as described above. NDF's shift from grants to a range of financial instruments is perhaps the key element of the current strategy. It is also one of the most significant questions facing the evaluation and has been emphasised by the reference group as a key element of NDF's strategy that requires investigation. This links directly to the ToC: NDF assumes that different instruments are suited to achieving different objectives and that their ability to choose the most instrument(s) and flexibly combine is their unique contribution to the global climate architecture. The first step of the process was therefore to group projects by financing type: grants (with challenge funds as subset); and non-grants (equities, loans, blended). Whilst most of the projects are pure grants, this is changing rapidly. Many of these are just starting and none have been completed. However, these have to form some of the case studies due to their importance as already outlined. In our clustering, there are 10/185 projects in the non-grants category.

Step 2: Application of selection criteria

Projects were then be filtered according to criteria to ensure a spread of projects. This will vary depending on whether in grants/non-grants cluster.

Criteria for non-grants

Since non-grants have only started recently, the strategic direction they hope to take (i.e. flexible use of instruments, leveraging private finance to new, innovative areas) is one of the main selection criteria for case studies in order to cover all possible scenarios.

We selected two case studies from this cluster: one pure loan/equity and one mix of grant and loan/equity. Ideally, one of the case studies should involve an MDB as a partner, while the partner in the other case should be a private actor.

Criteria for grants

From the grants cluster we selected four case studies. Our first selection criterion will be partner, due to the importance of partner type/mix to the overall evaluation. Given their weight in NDF's portfolio, we chose projects of the following MDBs, which make up 91.9% of projects in the grants cluster:

World Bank;

Asian Development Bank;

InterAmerican Development Bank;

African Development Bank.

Once these filters have been applied, we chose case studies, giving consideration to the remaining relevant criteria, taking account of the selections made in the non-grant cluster:

Data availability;

Geography;

Size (by value);

Importance of NDF in project (% share of total funding)

Stage of implementation;

Objectives/SDG;

Strategic objectives, e.g. gender.

While it is not possible to be representative in a small number of case studies, we sought to reflect the main features of NDF's activities as fully as possible. While NDF is involved in a large number of projects, its focus is actually quite narrow. We believe that this careful application of the criteria about allowed us to capture the most important elements, particularly the strengths and weaknesses of using different financial instruments.

The following tables present the selected case studies which have been chosen according to the process and criteria laid out above.

Table 3 Non-grant case studies

	Where and when	Type	EUR (%)	Partner	Objectives & SDG	Rationale for inclusion
African Guarantee Fund Green Guarantee Facility [NDF C88]	Africa regional 2016-2021 **(ongoing)**	E&G	17.mn (100% GGF; AGF has USD 530mn guarantees outstanding)	AGF (SME guarantee fund). Usual donor partners. GGF dedicated green facility	Categorization: Mixed Support SMEs focused on green, low carbon = private sector development (PSD) + mitigation SDGs	Largest and oldest non-grant investment. Aims to mobilise private lending to innovative sector. 8:1 leverage ratio Aims to prove concept and create demonstration effect for similar fund (catalytic) Strong additionality rationale
responsAbility Renewable Energy Holding Company (rAREH) [NDF C99]	Africa regional 2017-25 (ongoing)	Equity	7mn (50mn target for first close)	rAREH and whoever they can attract (private)	Categorization: Mitigation Renewables	Providing grant to set up entity. Now acting as anchor investor to mobilise private investment. Niche place in market = small to medium size energy facilities. Most activity very big or very small, and investors not able to access these types of investors

Table 4 Grant case studies

	Where and when	Type	EUR (%)	Partner	Objectives & SDG	Rationale for inclusion
Latin America Climate Change and Sustainable Cities [NDF C40]	Honduras, Nicaragua and Bolivia 2012-2016 **(closed)**	Grant	2.1 (2.6)	IADB	Categorisation: Mixed Urban development (developing methodology to design 'future cities')	Sector/SDG very interesting. Integrated urban development strategic priority for NDF. Data availability:

	Where and when	Type	EUR (%)	Partner	Objectives & SDG	Rationale for inclusion
						Completion reports included, NDF closing report included, evaluation included
Disaster Management and Climate Change Project [NDF C17]	Nicaragua 2011-2016 **(closed)**	Grant	2.5 (13)	IIC/IADB	Categorisation: Adaptation Climate resilience/ adaptation (rural communities' resilience to disasters and CC. Natural resource mgmt.; small infra etc.)	Sectors/SDGs very interesting Early partnership with IADB Data availability: Mid-term review included, Completion report, NDF closing report included, Final evaluation included (extern via IDB) (Evaluation report in Spanish).
Nordic Partnership Initiative Pilot Programme, Vietnam [C34]	2014-2016 **(closed)**	Grant	1.4	No Partner	Categorisation: Mitigation	The focus of the project is on scaling up mitigation actions, which is relevant far NDF's mandate. The project's sector focus (cement) raises questions of additionality. With a Nordic contractor the project is also interesting from a Nordic interest perspective. Data availability Mid-term review report included, Completion report included, NDF Closing report included, no evaluation
Increasing access to modern energy packages in rural areas, Uganda [C2]	2009-2013 **(closed)**	Grant	2.8	WB	Categorisation: Mitigation	Sectors/SDGs very interesting This is a follow-up project financing the second phase of ERT II and therefore raises questions of additionality. Data availability Completion report included, NDF closing report missing, no evaluation

Annex 8: Brief explanation of SROI

SROI is a framework for understanding, measuring and managing the outcomes of an organisation or policy area. It is particularly useful where an organisation has impacts across a 'triple bottom line' i.e. social, economic and/or environmental), or where many stakeholder groups are affected. It was developed from social accounting and cost benefit analysis, and has a lot in common with other outcomes approaches. SROI is distinct from these methodologies in the following ways:

It includes benefits to all relevant stakeholder groups, not just those that accrue to the State, or 'the economy'.

It places a monetary value on all outcomes – including non-traded outcomes - so that they can be compared with the investment made. This results in a ratio of total benefits (a sum of the value of all the outcomes) to total investments. For example, an organisation might have a ratio of £4 of social value created for every £1 spent on its activities. The ratio aims therefore for a holistic representation of value.

It is principles-based. This approach aims to ensure that all SROIs follow a prescribed methodology and to drive up the quality and reliability of SROI analyses.

It is a participative methodology. Stakeholders are engaged at key stages of the analysis to ensure that the appraisal is 'measuring what matters'.

While the ratio is important, SROI is about much more than this. A good SROI combines qualitative, quantitative and participative methods of evaluation and presents narrative and financial information that tells a story of change. The information should also help organisations focus on those activities that create the most social value.

The main strengths of SROI are as follows:

Outcomes focused

Combines qualitative and quantitative data

Participative methodology, indicators based on stakeholder perceptions of value

Compares costs and benefits, and provides a return on investment ratio

Includes non-market traded benefits

Can be applied to core business or discrete projects

Although methodological in nature, it can incorporate data from different kinds of outcome measurement tools

Provides flexibility. The principles can inform any stage of measurement without doing a full analysis. However, in order to qualify as a full SROI it needs to comply with all seven principles

Annex 9: Comments on data quality

Robust measurement is essential to demonstrate impact. More importantly, it is key to driving improvement. If you know the impacts you are creating and why, you can adjust decisions so that these increase over time. For organisations working on climate change with its time-limited imperative, this is particularly important. For those also trying to achieve development objectives in very poor, complex environments, a systematic approach to measurement is crucial. Most climate and development actors recognise these truths, but few measure impact robustly and use the results to guide decision-making.

There are two reasons for this. First, it is very hard. Second, there is a tendency to mimic what similar organisations do. The focus therefore tends to be on things that are easy to measure, and for everyone to measure the same thing, such as employment numbers. On its own, this is not an informative number. It tells us nothing about the nature of the job or who has obtained it (and therefore what value it has for them). Neither does it tell us how we should apportion credit for creating the job. The question of attribution is fundamental – if you don't know how important your intervention was relative to other factors, how can you know whether to do more or less of the same thing, or whether a different or complementary approach is needed?

If NDF takes the decision to design a new measurement system, which we strongly recommend below, there is a real opportunity to do something different and better. While the rationale would be to enhance NDF's impact, it could also set an example for others, potentially amplifying long-term impacts. For NDF, and its owners, this should be the key consideration. In this evaluation, we have experimented with the use of SROI to test the extent to which the data gathered is fit for purpose. In this section, we share the findings from that experiment. We begin by describing the current system that NDF operates.

NDF Project Performance Management System (PPMS)

NDF has a PPMS in place since 2011, which was further refined in 2016. This has the following goals:

1. Provide information to both the management and the country managers,

Provide information on the quality of the portfolio,

Be an early warning system for implementation related problems and de-railing, and

Provide feedback and information on fulfilment of the intended project outcomes.

The PPMS has the following elements (NDF, 2017):

1. Indicators for Institutional Level Results are used to examine how well NDF's activities are aligned with NDF's current strategy.

Guidelines for Project Identification and Screening are used when projects are selected for support, to ensure that they focus sufficiently on goals related to climate change, development and other issues prioritised by NDF.

Project and Programme Monitoring provides information on ongoing projects, which is critically assessed to help keep activities on track.

Project Performance Ratings (PPR) are assigned within NDF to build up a database illustrating how well projects are progressing with regard to their objectives and outcomes.

Evaluations of completed projects are carried out selectively.

In the closing reports, findings from the ratings, progress reports and other evaluation outputs are incorporated to give an overview of the project performance.

The ratings reports are developed by following the NDF guidelines, which identify the milestones that need to be met for projects to receive a particular rating. The ratings act as a mechanism for management to have oversight of the portfolio. The performance rating is based on colours (green, yellow, red); to assess whether projects on track. Where a project gets a yellow or red warning flag, management have to be informed and can get involved at that point. Yellow warnings tend to relate to delays and red warnings (with implications for project funding rarely happen. The rating is assigned based on the subjective judgement of project officers; however, they also carry out an internal peer review to improve the quality of decisions. As well as this system, NDF use several informal approaches to monitor projects, including meetings with partners, site visits to projects and conferences which bring stakeholders together.

When asked about their level of satisfaction with the system, NDF reported that is most useful for project monitoring/portfolio analysis (e.g. how many projects relate to mitigation) than for outcomes management. There are two elements to this. First, whilst their internal systems add value in certain ways (e.g. the rating system is useful for management oversight of projects), it does not enable outcomes to be systematically gathered from the projects. Neither does NDF have internal expertise on M&E to oversee such a system. Second, NDF relies in large part of the performance management capacity of its partners, especially the MDBs. They see this as a key complementarity where they can 'piggyback' on partners' existing development impact systems and expertise. However, there are several limitations to this:

It requires partners to be completely transparent with NDF and share all information with them. As described in 5.3.2, NDF have a mixed experience of this

The quality of partners' monitoring systems may be weak

The indicators are not 'owned' by NDF and NDF staff have reported that it is not always possible to get their indicators included in the projects' evaluation framework

Issues of additionality are more complex with co-financed projects.

Given that the PPMS is neither intended, nor suitable for outcomes management, it has not been possible to provide a summative overview of the ratings reports, or to use them to inform the evaluation. The implications of this have been discussed throughout. We now provide an overview of the SROI approach before discussing the findings from using the framework to analyse the case studies.

Overview of SROI approach

Demonstrating value for money (VfM) is now a common requirement for those working in development co-operation. Despite this, there is no agreed methodology for how such an assessment should be undertaken, nor a common conceptual basis to underpin it. Indeed, the use of VfM is still subject to substantial criticism and, in some quarters, skepticism. While the historical uses of VfM analysis has been problematic in some cases, when done well, the approach can yield significant benefits. If VfM is used to consider the relationship between costs and outcomes, holistically, and across a range of stakeholders, resources can be allocated optimally to maximise the total benefit of interventions.

Since the start of the 21st century, there has been a renewed interest in VfM across OECD countries (Baker et al. 2013). As well as traditional approaches such as Cost Benefit Analysis (CBA), new frameworks have emerged that allow different types of benefits to be measured and compared. Social Return on Investment (SROI), for example, was developed to measure and value externalities, to put equity considerations at the heart of the analysis, and to balance different types of benefit. This seems highly relevant to interventions seeking to achieve environmental and social benefits.

To begin to assess this, the evaluation of NDF has tested the use of SROI on a sample of projects. It should be noted, however, that SROI is just one of several approaches that could be employed.

SROI was developed from a social accounting and emphasizes working with available data to support decision-making. It is a mixed methods measurement tool that helps organisations to understand, manage and quantify the social environmental and economic value they are creating. SROI is well-developed in social economy organisations in developed countries, especially in the UK, Canada and Australia. In these countries, the emphasis has been on promoting take-up, including by non-evaluation experts and non-economists. However, interest is growing in its potential in developing country contexts as a replacement for traditional value for money approaches and there are active networks of practitioners worldwide, including in South Africa (Social Value UK, 2019).

Key features include:

It captures benefits to all relevant stakeholder groups, not just those that accrue to the state, or the economy as with traditional cost benefit analysis

It places a monetary value on all outcomes – including non-traded outcomes - so that they can be compared with the investment made. This results in a ratio of total benefits (a sum of the value of all the outcomes) to total investments. For example, an organisation might have a ratio of £4 of social value created for every £1 spent on its activities. The ratio aims therefore for a holistic representation of value.

It is a participative methodology. Stakeholders are engaged at key stages of the analysis to ensure that the appraisal is 'measuring what matters'. The valuation process can also be informed by stakeholder perceptions of value. For example, where women's paid labour is undervalued in the labour market, SROI allows these inequalities to be 'corrected' by adjusting up the proxy, or by valuing the additional benefits that stem from work.

It follows a set methodology, which should support a degree of comparison between projects, assuming that similar assumptions have been used.

Unlike other methodologies, the process of completing an SROI

To develop such an approach fully would require investment and commitment, but it may also add value over and above its value for NDF i.e. there is scope to influence other donors and investors, not just on an approach to measure but on the complexities of the outcomes that they are seeking to achieve, and the best ways to maximise social, economic and environmental value from climate finance.

Lessons from the use of SROI in the case studies

The use of SROI in the NDF case studies has shed light on several issues that could be addressed to improve NDF's performance management.

SROI is a relatively data-heavy methodology i.e. output indicators of the kind that NDF projects tend to have are usually not enough to carry out even a simplified analysis. Four types of data are required for the SROI analysis:

1. Outcomes data. These are required for all material stakeholders and the better the data quality, the better the analysis. Identifying the right outcomes and indicators and focusing them on the most significant sources of value is key here.

2. *Longitudinal data*. This assists with evidencing how long change lasts after engagement with the programme – this is known as the *benefit period.* As outcomes are projected into the future, it is

necessary to know whether outcomes endure after the project end and for how long. These can be based on plausible assumptions (e.g. the lifetime of a particular technology).

3. *Counterfactual data*. This is required to enable an estimation of the added value of the project – that is, the change that is above and beyond what would have happened anyway, or as a result of other actors. Of all of the data types, this is often the most challenging. The most robust way of dealing with this is an experimental study, however, these kinds of methods are usually not possible, or desirable. However, this does not mean that additionality should be ignored. There are ways to estimate counterfactuals, including building them into data collection and using secondary literature to estimate them. Even if they cannot be measured directly, it is important to analyse where additionality is most likely to be achieved and under what conditions.

4, *Financial data* Financial data is required for two purposes. Firstly, to accurately determine the 'input' cost or investment. Secondly, financial data is required to derive financial proxies to value non-traded outcomes. This can usually be done using desk research e.g. drawing on the large environmental economics literature (e.g. Defra, 2010).

Our analysis has led to the following findings:

1. Many of the areas that NDF invest in are complex with multiple stakeholders and impacts. They are also often challenging markets to work in, and there is potential for negative unintended consequences. This requires more of a research-based approach to investment decisions to ensure the best decisions are being taken. The current RBM framework does not capture enough data at a granular enough level to support the use of methodologies like SROI.

2. The range of impacts that could be achieved from electrification is potentially very wide-ranging, but these are currently not being considered by projects even in the proposal stage. Projects are likely to therefore be undervaluing the benefits the generating. On the other hand, there are risks of negative unintended consequences (e.g. where off-grid users have few appliances and are not making much use of their electricity but are making substantial repayments on borrowed funds). Understanding and balancing these effects is important to assess the net impact of projects.

3. The case study impact maps set out an evidence matrix comparing NDF's data with what would be required to do an SROI. Whilst this might seem labour intensive, there are short-cuts that could be taken to simplify the measurement. The principle of materiality is important here i.e. the need to focus measurement on the most important pieces of information. This will require going beyond metrics like 'number of people connected' and 'volume of electricity produced' to take account of things like the Productive Uses of Electricity (which would align well with gender mainstreaming). As NDF works on similar projects (e.g. off-grid renewables), much of this information could be used across a sector.

Grappling with these issues somewhat intractable issues will require thought and investment from NDF. It is out of scope in this evaluation to provide detailed recommendations on what NDF should measure, it is for the organisation to decide this itself.

Annex 10: List of people interviewed

Core stakeholders

Staff

Interviewee
Karin Isaksson(Incoming MD). Was interviewed in the capacity of Executive Director in the AfDB.
Leena Klossner Vice President, Acting Managing Director Leena.klossner@ndf.fi
Charles Wetherill Program Manager (Public/Private sector) charles.wetherill@ndf.fi
Mats Slotte Manager, Financial Administration Mats.slotte@ndf.fi
Christina Stenvall-Kekkonen Vice President, Chief Counsel christina.stenvall-kekkonen@ndf.fi
Emeli Möller Program Manager (NCF) emeli.moller@ndf.fi
Aage Jörgensen Program Manager (Public sector) aage.jorgensen@ndf.fi
Jessica Suominen Finance
Joanna Zilliacus (NCF) Johanna.Zilliacus@ndf.fi
Visa Tuominen (NCF) Visa.Tuominen@ndf.fi

Board of Directors

Interviewee
Denmark Dorthea Damkjær, Chief Advisor, Ministry of Foreign Affairs,
Finland Max von Bonsdorff, Director of Unit for Development Financing Institutions, Ministry for Foreign Affairs
Iceland Egill Heiðar Gislason, Advisor
Norway Hans Olav Ibrekk, Policy Director, Ministry of Foreign Affairs, (Chair of the Board)
Sweden Lars Roth, Deputy Director, Ministry for Foreign Affairs, (Deputy Chair of the Board)

Control Committee/Council of Ministers

Interviewee
Jan-Erik Enestam Chairman of NDF's Control Committee (the supervisory body) jee@kitnet.fi .

Dagfinn Hoybråten Nordic Council of Ministers, Secretary-General nmr@norden.org .

Connected stakeholders

MDBs (additional to those covered in case studies)

Interviewee
AfDB: Desire Vencatachellum Director, Partnerships and Resource Mobilization d.vencatachellum@afdb.org Lauréline Pla Senior Resource Mobilization and Partnerships Officer
World Bank: Benoit Bosque Director, Environment and Natural Resources for World Bank. Formerly in same role for Africa.
IDB: Miguel Aldaz Lead Partnerships Officer
ADB: Rikard Elfving Senior Social Development Specialist. Previously NDF coordinator at the Office for Co-financing Operations, OCO.

Private sector partners

Interviewee
Jay Koh, Managing Director/Lightsmith, i.e. the CRAFT project www.lightsmithgp.com
Off-grid Energy Access Fund: Harry Guinness Director, Lions Head Global Partners. harry.guinness@lhgp.com
Climate Investor One: Adam Tunnicliffe Associate, Capital Raising & Business Development Climate Fund Managers A.Tunnicliffe@climatefundmanagers.com www.climatefundmanagers.com

External stakeholders

NEFCO/NIB

Interviewee
Magnus Rystedt Managing Director magnus.rystedt@nefco.fi
Johan Ljungberg Chief Environmental Analyst, NIB observer on the NDF Board of Directors johan.ljungberg@nib.int

Climate Finance

Interviewee
CPI: Barbara Buchner (also partner) (coordinator of the Global Climate Innovation Lab) Executive Director, Climate Finance, CPI
Email & Skype for Business: barbara.buchner@CPIClimateFinance.org
ODI: Neil Bird: Senior Research Fellow. Responsible for Climate Finance Monitoring

Annex 11: Case study reports

This Annex contains the case study reports in the following order:

Case Study C2 – Modern Energy project
Case Study C17 – Disaster Management and Climate Change Programme
Case Study C34 – Nordic Partnership Initiative Pilot Programme
Case Study C40 – Emerging and Sustainable Cities Initiative
Case Study C88 – African Guarantee Fund
Case Study C99 – responsAbility Renewable Energy Holding company (rAREH)

The reports are structured in the following main chapters:

1. Background and context
2. Stakeholder mapping and NDF's role in the project
3. Outcome analysis
4. Findings on additionality/complementarity
5. Findings on implementation issues
6. Economic assessment
7. Assessment of data quality and gaps
8. Conclusions and recommendations / lessons learnt

Case Study C2 – Modern Energy project

List of Acronyms

Acronym	Meaning
DALYS	Disability Adjusted Life Years
ERT	Energy for Rural Transformation Project
ESG	Environmental, Social, and Corporate Governance
EUR	Euro
GEF	Global Environment Facility
GHG	Greenhouse Gas
GNI	Gross National Income
HCII	Health Centre II
HCIII	Health Centre III
HCIV	Health Centre IV
HIPC	Heavily Indebted Poor Countries
ICTs	Information and Communications Technologies
IDA	International Development Association
MDRI	Multilateral Debt Relief Initiative
NDC	Nationally Determined Contributions
NDF	Nordic Development Fund
NOx	Nitrogen Oxides
NPV	Net Present Value
PEAP	Poverty Eradication Action Plan
PV	Photovoltaic
SDR	Special Drawing Rights
SROI	Social Return on Investment
TVs	Televisions
UN	United Nations
USD	United States Dollar

Background and context

About the World Bank/International Development Association (IDA)

The International Development Association (IDA) of the World Bank provides loans (credits) on concessional terms (low or no interest, 30-38 years repayment period, 5-10 years grace period) for the world's 75 poorest countries, including 39 countries in Africa. Grants are also provided to countries at risk of debt distress. IDA aims to reduce poverty with programmes that boost economic growth, reduce inequalities, and improve living conditions, covering primary education, basic health services, clean water and sanitation, agriculture, business climate improvements, infrastructure, and institutional reforms. IDA is the single largest source of donor funding for basic social services in the countries served. Moreover, IDA provides debt relief through the Heavily Indebted Poor Countries (HIPC) Initiative and the Multilateral Debt Relief Initiative (MDRI). In the July 2017-June 2018 fiscal year, IDA commitments were USD 24 billion of which 21 % were provided as grants, financing 206 new projects. IDA has since 1960 provided USD 369 billion for investments.

Background to the Global Environment Facility (GEF)

The Global Environment Facility was established at the 1992 Rio Earth Summit. The GEF aims to tackle some of the most pressing environmental problems, focusing on biodiversity, chemicals and waste, climate change (mitigation and adaptation), forests, international waters, and land degradation. Over the years, the GEF has provided more than USD 18 billion in grants and mobilised an additional USD 94 billion in co-financing. The GEF has co-funded over 4500 projects in 170 countries.

Background to the NDF investment

Uganda is a low-income country with a gross national income (GNI) per capita of USD 600 in 2017 (the World Bank). Uganda is one of the 12 NDF focal countries in Africa. NDF had prior to the project provided EUR 23.7 million in credits and 32.2 million in SDR (special drawing rights) to Uganda. Like the other multilateral development banks, the World Bank is a key partner for NDF. NDF consults with their existing partners, including the World Bank, on a regular basis and are made aware of new opportunities as they are being developed. The World Bank and proposed in 2009 to NDF to support the Energy for Rural Transformation Project Phase Two (ERT II) project.

The Increasing Access to Modern Energy Packages in Rural Areas project (Modern Energy project), Uganda

The NDF-funded Modern Energy project complemented, and was loosely under the umbrella of, ERT II. It was the second NDF project approved after climate change had been identified as the core focus of NDF. The project aimed at rural transformation through improved, and more equitable health, water, educational and civil services for rural people. This was done through increasing energy efficiency and the use of renewable energy technologies in rural Uganda.
The development objective of the Modern Energy project was "*to increase the use of renewable energy technologies in rural Uganda, in order to decrease present and future growth of greenhouse gas (GHG) emissions*".
The immediate objective of the project was "*to decrease greenhouse gas emissions by installation of solar photo-voltaic systems in health centre and water supply facilities in remote communities in selected districts of the Northern and Eastern Uganda"*. To this end, the Modern Energy project had two components/outcomes:

1. Health component – to improve the delivery of health services in rural health centres in remote areas through the use of solar photovoltaic (PV) systems.
2. Water component – to improve the delivery of water supply services by providing solar PV systems for pumping stations far from the electricity grid.

The components complemented component 3 of ERT II (energy development, cross-sectoral links, impact monitoring), and more specifically sub-component 3.1 (energy packages for health, water, and education). ERT II had a broad focus on rural electrification, including household supply, on-grid and off-grid electricity, credit access, private sector investment, and information and communications technology – whereas the Modern Energy project exclusively focused on of-grid solar PV systems for health and water facilities.

The main activities were: a) needs and feasibility assessments, b) design, supply, installation and maintenance of the solar energy packages, c) beneficiary and user training, d) supply of spare parts for the energy packages, and e) installation of water storage and pump site facilities.

The project was implemented in nine districts.

Complementary information on context and needs

This section describes the context for the investment and need that it is responding to.

Low levels of access to energy in rural areas

Access to energy is low in Uganda with only 26.7% of the population having access to electricity in 2016. Poor access to electricity is in particular an issue in rural areas, only 18% of the rural population had a had access to electricity in 2016. (https://www.se4all-africa.org/seforall-in-africa/country-data/uganda/). Diesel generators and kerosene lamps are used in these sites, but these sources are more expensive and less reliable as their functioning depends on the availability and affordability of fuel, and they are the source of emissions of both greenhouse gases (carbon dioxide/CO_2) and air pollution (NOx). The limited access to electricity also negatively affects the capacity to deliver reliable quality social services in these locations. Health services require electricity for the running of equipment and cold storage of medicines, and water supply services require energy for pumping water. Many remote rural areas are prohibitively expensive to connect to the electricity grid, whereas small-scale off-grid solutions are more economically viable.

Greenhouse gas emissions and air pollution

Diesel generators and kerosene lamps are widely used in off-grid sites, and are the source of emissions of both greenhouse gases (CO_2) and air pollution (nitrogen oxides/NOx). Replacing them with sustainable energy sources would alleviate these environmental problems. In 2014, the total CO_2 equivalent emissions from Uganda were 59.9 megatonnes, of these, only 8.5 megatonnes were from energy consumption (https://www.wri.org/resources/data-visualizations/greenhouse-gas-emissions-over-165-years). But while the figure is low, the emissions from energy consumption will increase with population growth and economic development, unless sustainable energy solutions are adopted.

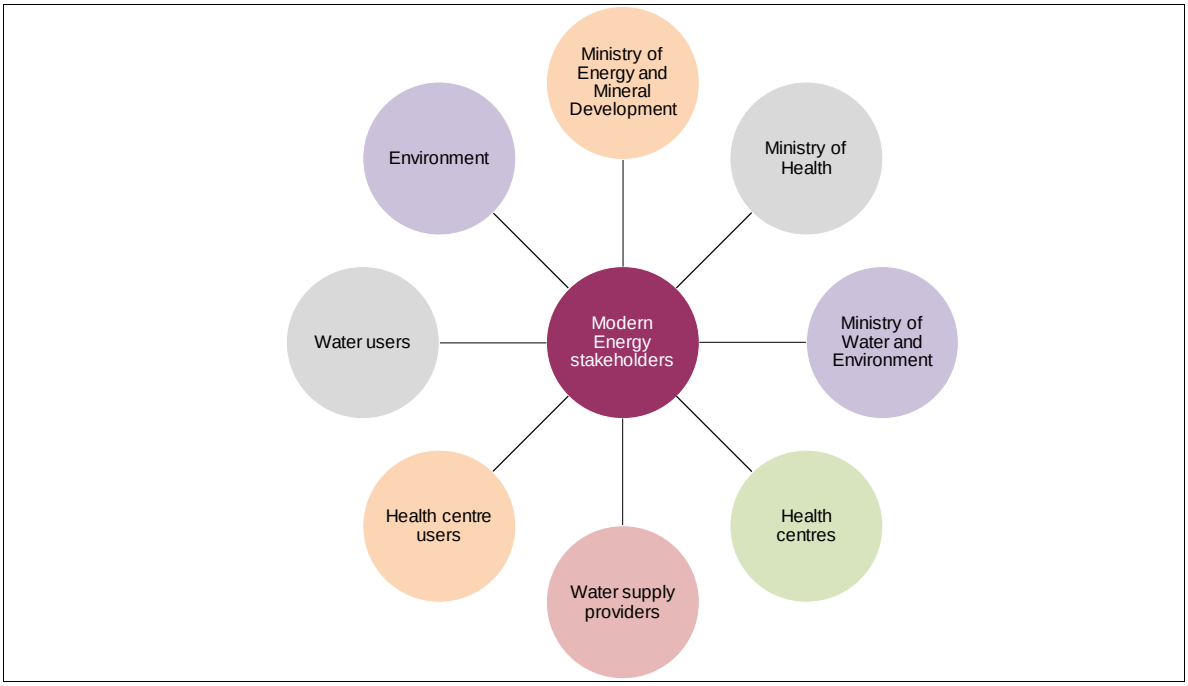
Stakeholder mapping and NDF's role in the project

Stakeholder mapping

In this section, we map the project stakeholders and for each group identify the key outcomes that are expected.

Figure 1 sets out the stakeholder map.

Figure 1 Stakeholder Map



The Ministry of Energy and Mineral Development was responsible for the coordination and oversight of the project. As the line ministry for energy, the project enabled the Ministry (at central and sub-national level) to promote the expansion of electricity services and reach unserved or underserved health centres and water supply schemes in remote rural locations.

The Ministry of Health was responsible for the implementation and procurement for the installation of solar PV systems in the health clinics. The Ministry (at central and sub-national level) benefited from being able to ensure that health centres in remote locations had better access to electricity, enabling them to provide better and more reliable health services to their patients.

The Ministry of Water and Environment was responsible for the implementation and procurement for the installation of solar PV systems in water supply schemes. The Ministry (at central and sub-national level) benefited from being able to expand the coverage and/or increase the reliability of water supply services in remote locations.

The health centres benefit from the improved and more reliable access to energy enabling them to provide more reliable and more effective health services to their patients. It also enabled energy cost savings by removing the need for purchasing diesel for generators and kerosene for lamps. Three levels of health centres were targeted: health centre II (HCII) at parish level, health centre III (HCIII) at sub-county level (HCIII), and health centre IV (HCIV) at county level.

The water supply providers benefit from the improved and more reliable access to energy enabling them to expand the coverage of water supply and/or improve the reliability of the water

supply to their customers. It also enabled energy cost savings by removing the need for purchasing diesel for generators.

Health centre patients/users (including women and children) benefit from the access to better and more reliable health services.

Water users (including women and children) benefit from the improved and more reliable access to clean water. They are involved in the operation and maintenance of water systems.

The environment benefits from the reduced emissions of greenhouse gases (CO_2) and reduced air pollution (NOx) from the running of diesel generators and kerosene lamps for electricity generation.

NDF's role in the project

NDF provide funding directly to the Government, and the management, implementation and procurement are handled by the three participating ministries. The Modern Energy project was only loosely associated with the World Bank and GEF funded ERT II. There was only limited contact between NDF and the World Bank and there was no joint project steering committee for the two projects (interview). Nonetheless, both projects were managed by the same team at the Ministry of Energy and Mineral Development, and hence the Modern Energy project did not have to provide any financing for project management (interview); this was covered by ERT II. Moreover, World Bank procedures were also used for the procurement for the Modern Energy project (NDF board consideration). These features as well as the fact that the design was done by the World Bank, allowed NDF and the Modern Energy project to latch on to the due diligence and ESG (environmental, social, and corporate governance) safeguards of the World Bank (interview). NDF also carried out an ex-post procurement audit (NDF mission back-to-office report).

The total budget of ERT II and the Modern Energy project was USD 110 million. NDF provided a grant of EUR 3 million (EUR 2.8 million were disbursed) for the Modern Energy project in 2009-2017. The NDF grant was allocated as follows:

- Technical assistance/consultancies: energy for health services: EUR 0.25 million, energy for water services: EUR 0.21 million
- Installation and equipment: energy for health services: EUR 1.44 million, energy for water services: EUR 0.7 million
- Contingencies: EUR 0.4 million

For ERT II, the World Bank/IDA provided a loan (credit) of USD 87 million, the GEF provided a grant of USD 9 million and the Government of Uganda provided USD 9 million.

Outcome analysis

In this section we map the main outcomes for each stakeholder and describe each outcome and how it is expected to be achieved.

Table 5 Outcome map

Stakeholder	Short-term outcome	Medium/long-term	Description
Ministry of Energy and Mineral Development	Increased capacity to promote off-grid electricity expansion for social service facilities in remote off-grid rural locations	Ability to replicate and upscale the provision of improved off-grid electricity for social service facilities in remote rural locations across Uganda (if funding is secured)	Off-grid solar PV systems
	Increased and expanded provision of electricity for social service facilities in remote rural locations covered by the project		
Ministry of Health	Increased capacity to roll out improved electricity supply at health centres in off-grid locations	Ability to replicate and upscale the provision better health services (if funding is secured)	See health centres below
	Improved quality of health services in remote rural locations covered by the project		
Ministry of Water and Environment	Increased capacity to roll out improved electricity supply for water supply schemes in off-grid locations	Ability to replicate and further expand the provision of reliable water supply services (if funding is secured)	See water supply providers below
	Expanded and more reliable water supply in remote rural locations covered by the project		
Health centres	Reduced electricity costs, expanded use of equipment, ability to run more types of equipment, cold-storage of medicine – more treatment options	Better health services for patients	Reduced costs of diesel and kerosene, more reliable and continuous power supply
Water supply providers	Reduced electricity costs, larger volumes of water pumped	More reliable water supply services	Reduced costs of diesel, more reliable and continuous power supply e.g. enabling water pumps to run longer hours and installation of new pumps
	Larger volumes of water pumped, pumps installed in new locations that die not have affordable energy access before	Provision of water to more users	New pumps installed
	Improved working conditions and better protected pump sites	Improved lives of staff, reduced pilfering and vandalism	Fencing, security guard shelters and toilets
Health centre patients/users	Improved access to health services	Improved health and reduced mortality	
Water users	Improved and more reliable access to clean water, less time spent collecting water, reduced costs of water	Better health, time freed up for other activities	
Environment	Reduced emissions of greenhouse gases	Reduced magnitude of climate change	CO_2
	Reduced air pollution from combustion of diesel in diesel generators and kerosene lamps	Reduced hazard to health and ecosystems	NOx
	Reduced noise pollution from the running of generators	Reduced hazard to health	

Details on main outcomes achieved

The NDC closing report provides the data presented in this section on the main outcomes and outputs achieved by the Modern Energy project.

Table 6 Targets and results

Scope	Baseline	Original target	Revised target	Achieved target	Comments
Percent of health centres with access to electricity in 9 rural districts	HCII 6% HCIII 18% HCIV 16%	HCII 55% HCIII 65% HCIV 100%	HCII 50% HCIII 90% HCIV 100%	HCII 81% HCIII 90% HCIV 113%	Target exceeded due to the increase in beneficiary HCs from 98 to 143
Number of water supply schemes with access to electricity	44	48	51	51	Target achieved. 3 new schemes were added based on contractual cost savings
Tons of CO_2 emissions reduced/ avoided as a result of the Project	0	1.500	1.500	2.022	Target exceeded due to savings from the additional HCs

The costs of solar energy packages went down significantly over the implementation period. The savings were used to increase the number of solar PV installations, covering more health centres (increased from 98 to 143 centres), water supply schemes (increased from 48 to 51), and water pumping stations (increased from 4 to 7) than originally foreseen. Moreover, a larger than foreseen number of spare parts were purchased. The project closing date was extended from June 2013 to December 2017 to allow for this expansion. So the original targets of the project were exceeded.

Improved access to energy

A total of 121 kWp (kilo Watt peak) was installed in 143 health centres. This increased the coverage as follows: before the project only 6% of the HCII centres in the nine districts covered had access to electricity, while after the project this figure was increased to 81%. For HCIII centres, the coverage was increased from 18% to 90%, and for HCIV centres it was increased from 16% to 113% (it is unclear how more than 100% could be covered).

A total of 45 kWp was installed in 7 water pumping schemes serving 51 water supply schemes.

The installed solar PV systems allowed replacement of diesel generators and kerosene lamps, so savings were made on the costs of fuel and maintenance on these. The installation of solar PV systems also reduced the risk of energy failures.

Overall, the project increased the access to electricity, improved the reliability of the access to electricity, and reduced the costs of electricity for the benefitting health centres and water schemes.

Improved access to health services

The access to electricity allowed for a significant improvement of the health services provided, including:

- maternity care in the nights

- microscopy for diagnostics and refrigeration for vaccine conservation
- information and communication services such as operation of TVs, radios and phone-charging
- improved lighting in and around the beneficiary sites to facilitate work and security; (iv) improved access to clean water
- reduced electricity bills freed up resources for other purposes

Considering their specific health care needs and vulnerabilities, women and children in particular benefitted from the improved health services, such as improved maternity care (interviews).

The estimated number beneficiaries of the improved services at the 143 health centres is approximately 800,000 persons annually.

Moreover, for ERT II, it was found that the provision of electricity to health centres had a positive influence on the retention of health professionals.

Improved access to clean water

The access to electricity allowed for a significant improvement of the water services provided, including:

- Improved access to clean water – continuous and more reliable access, access to more water (in rural towns)
- Increased coverage of water supply services (interviews)
- Significantly reduced costs of water, due to reduced electricity costs. Water use fees are 10 Ugandan shillings (<1 EUR cent) per 5 litres of water, compared to around 200 shillings for the alternatives such as grid electricity or generators (NDF mission back-to-office report).
- fencing and improved lighting in and around the beneficiary sites to facilitate work and security (reducing pilfering and vandalism)

For women and children, who are traditionally responsible for collecting water, the work load and time spent collection water had reduced by shortened distances to water sources. This in turn has released time and energy for other tasks, such as attending school (NDF mission back-to-office report, interview). Year-round access to clean water are likely to also have had health benefits, e.g. vis-à-vis diarrhea and cholera, diseases which children are particularly vulnerable to.

The estimated number beneficiaries covered by the supported water schemes was approximately 16,000 persons in 2016, and project to increase to approximately 23,000 people in 2020 (e.g. due to population growth).

Reduced greenhouse gas emissions

The reduced reliance on diesel generators and kerosene also led to a total reduction in CO_2 emissions of 2,022 tonnes over the estimated 15 years lifetime of the installed solar PV systems, as shown in the table below. The annual reduction is estimated at 134,75 tonnes.

Table 7 Emission reductions achieved

Item	Health centres	Water pumping schemes
Amount of CO_2 (kg) emissions avoided per kWp installed/annum	770	770
Actual tons of CO_2 emissions avoided per annum	93.17	41.58
Actual tons of CO_2 emissions avoided per lifetime (15 years)	1,398	624
Tonnes of CO_2 emissions avoided due to project investments		2,022

Another environmental benefit is the reduction in air pollution caused by the emission of NOx from the combustion of diesel and kerosene in generators and lamps. Moreover, the noise pollution from running diesel generators was reduced. (interview).

Details on contribution to outcomes (incl. NDFs' leverage)

NDF contribution to projects

The available information is insufficient for fully assessing the additionality and complementarity of NDF. NDF funding allowed for an increase in the volume of solar PV systems and infrastructure installed and the number of health clinics and water supply systems served. The solar PV energy packages developed for the ERT II project were adopted for NDF, and the procurement process followed were those of the World Bank. Funding was provided for consultant services, but the use of these resources and the contribution made is unclear, and this appears not to be an area of significant added value (interview). It is unclear how the project was developed, but the design appears to have been carried out by the World Bank (no NDF funding went to project preparation); in this context it should be noted that the Modern Energy project was one of the first NDF projects under its climate change mandate.

Leverage

Overall, the project appears to have had limited leverage. ERT II would have been implemented with World Bank and GEF financing irrespective of NDF's involvement, as evidenced by the fact that there was an earlier phase of ERT and that a third phase (ERT III) is currently under implementation without NDF support – the lack of continuation from NDF's side of this successful project appears to be linked to the lack of contact with the World Bank. Nonetheless, NDF funding allowed for an increase in the volume of solar PV systems installed and the number of health clinics and water supply systems served. It should be noted that under ERT III, there is only a budget of USD 11 million for the components supported by NDF, out of a total budget of USD 176 million.

The Modern Energy project was in general well managed and the implementation of was successful with the targets exceeded; this success reflects well on the three implementing ministries and is a testimony to their project management capacity, and is thus likely to contribute to facilitating discussions with donors for future support (NDF mission back-to-office report). However, some management shortcomings were found for ERT II which are likely also to have affected the Modern Energy project, such as delays in payments and transfer of funds under component 3 and lack of consultation with line ministries when workplans were amended, was long delays in repairs of the electrified water supply schemes, especially in remote locations.

Findings on other issues

Alignment with mandate

The project was aligned with NDF's mandate in several ways. The project focused specifically on promoting sustainable energy solutions and reducing greenhouse gas emissions. While promoting improved livelihoods and health, through improved access to health and water supply services. The project thereby embraced an integrated approach, which addressed both environmental and social concerns. Moreover, the project was aligned with NDF's financing approach: "*NDF flexibly uses grants and other forms of financing for climate change investments in low-income countries which are eligible for support from IDA*".

The project promoted innovation in terms of rolling out off-grid solar PV solutions for remote locations, which at the start of the project was a novel and less developed solution than today. However, while the solution was new and there globally was a degree of scepticism about the potential of solar PV system, which were considerably more expensive than today, the project cannot not be classified as high risk as such, since it followed an approach that had been tested and refined under ERT phase 1 (ERT I), nor did it target private sector development, as the focus was on a) public and community-managed services.

Alignment to partner priorities

Historically, there has been a significant Nordic engagement in Uganda, which for example is a Danida programme country. The focus on climate change mitigation and sustainable energy is also well aligned with the priorities and expertise of Nordic countries. The project benefited women and children with the improved access to health services and clean water and the related health benefits, and also reduced the burden of collecting water with greater proximity to water sources. Women were involved in all consultations before and after installation, and reportedly, women were represented in community committees (interview).

The Modern Energy project was aligned with the energy part of the objective for ERT II: *"increasing access to modern energy and ICTs in rural Uganda"*. As such, it aligned with the World Bank/IDA's aim to reduce inequalities (e.g. in access to services), and improve living condition, basic health services, clean water and sanitation, and infrastructure. Moreover, it aligned with the GEF's aim vis-à-vis climate change mitigation by promoting sustainable energy.

Moreover, the project aligned with the Government of Uganda's policy priorities. The Poverty Eradication Action Plan (PEAP) had energy and rural transformation, including universal access to electricity as a key priority, as the PEAP considered lack of electricity a key obstacle to rural development and poverty reduction, and thus recognised that increased investment in the energy sector were required. It also acknowledged that inappropriate energy technologies (e.g. inefficient combustion) create health problems and environmental degradation. The PEAP encouraged improvements in infrastructure development and delivery of social services (such as health and water) to stimulate socio-economic growth and reduce poverty. Moreover, the Modern Energy project aligned with the Government's Vision 2040 and the National Development Plan 2010/11-2014/2015 as well as the Government's commitment under the Sustainable Energy for All (SE4ALL) initiative: "*attaining universal access to modern energy services, improving energy efficiency, and increasing the share of renewable energy in power generation*".

Experience with private sector

The Modern Energy project was implemented by the Government and funded by international development partners, and not with private sector partners. Private companies were contracted for

the delivery and installation of solar PV systems (NDF mission bac-to-office report), and consultants were engaged to provide technical assistance (NDF board consideration).

Catalytic effect

The available information is insufficient for assessing the extent to which the project and NDF had a catalytic effect, but the available evidence suggests that the catalytic effect was limited. A third phase of the Energy for Rural Transformation Project is currently under implementation, but this is not funded by NDF.

Nordic 'value added'

Seemingly, there was no Nordic added value. No Nordic companies were contracted, despite the expectations at design that Nordic firms would be capable consultant services and materials (e.g. equipment for solar PV systems). The solar PV energy packages developed for the ERT II project were also promoted by the Modern Energy project funded by NDF.

Assessment of data quality and gaps

Data gaps/quality related to outcomes (incl. contribution to outcomes)

The NDC closing report provides data on the number of health centre, pumping schemes and beneficiaries reached, the power capacity installed and CO_2 emission reductions, with more detailed information annexed to the final draft report, but not to the final report. There is only limited and qualitative information about the other outcomes and impacts of the project due to an overall scarcity of available documents and stakeholders for interview.

Table 8 Evidence matrix

Stakeholder	Short-term outcome	Data availability
Ministry of Energy and Mineral Development	Increased capacity to promote off-grid electricity expansion for social service facilities in remote off-grid rural locations	No data available
	Increased and expanded provision of electricity for social service facilities in remote rural locations covered by the project	Data provided in NDF closing report
Ministry of Health	Increased capacity to roll out improved electricity supply at health centres in off-grid locations	No data available
	Improved quality of health services in remote rural locations covered by the project	Qualitative information available from NDF closing report, NDF mission back-to-office report, interview
Ministry of Water and Environment	Increased capacity to roll out improved electricity supply for water supply schemes in off-grid locations	No data available
	Expanded and more reliable water supply in remote rural locations covered by the project	Data on the number of pumps provided in NDF closing report
Health centres	Reduced electricity costs, expanded use of equipment, ability to run more types of equipment, cold-storage of medicine – more treatment options	Some qualitative information available from NDF closing report, NDF mission back-to-office report, interview
Water supply providers	Reduced electricity costs, larger volumes of water pumped	Some qualitative information available from NDF closing report, NDF mission

		back-to-office report, interview
	Larger volumes of water pumped, pumps installed in new locations that did not have affordable energy access before	No data available
	Improved working conditions and better protected pump sites	Some qualitative information on the activities leading to this available in the NDF closing report
Health centre patients/ users	Improved access to health services	Data on number of people reached available on NDF closing report Some qualitative information available from NDF closing report, NDF mission back-to-office report, interview
Water users	Improved and more reliable access to clean water, less time spent collecting water, reduced costs of water	Data on number of people reached available on NDF closing report Some qualitative information available from NDF closing report, NDF mission back-to-office report, interview
Environment	Reduced emissions of greenhouse gases	Data on emission reductions available from NDF closing report
	Reduced air pollution from combustion of diesel in diesel generators and kerosene lamps	No data available

Data gaps/quality related to other issues

The project was never evaluated. The reports available for the evaluation team were limited to the brief NDF board consideration and closing report as well as an NDF mission back-to-office report. A full completion report was available for ERT II but this report does not cover the NDF-funded Modern Energy project. Only one interview was held, with the NDF programme manager. Written responses were provided by two ministries.

Discussion of economic assessment

An SROI model is an Excel-based set of calculations that compares the value of the outcomes to the costs of the investment. Due to data limitations, it is not possible to complete a full SROI or economic assessment for this case study. Instead, the evaluation team have gone through the steps to completing such an analysis and have highlighted what data would be required. For example, whilst we know the number of health centres/water schemes with energy provision, we do not know anything about the impact quantitatively that access to electricity via this scheme has on health outcomes. This type of data is important for an economic analysis, it is not possible, as with other methods to assume that access to electricity is a good thing; we need to know what has changed for beneficiaries by how much and whether that change was additional.

An economic analysis has already been conducted for this project by the World Bank. For Component 3 of the project, of which the NDF investment was a part, it found a negative Net Present Value of USD -3.8 million Although this didn't directly address the NDF part of this investment, the analysis was based on the same work (electrification of health centres and water supplies in Uganda). Crucially, the analysis was only able to include a small number of outcomes – savings on diesel/kerosene and carbon emissions. The report states that that *"there are positive externalities and spillover effects derived from increasing access to electricity to health and education centers, and water supply schemes, which are difficult to estimate and were not included in the calculations (for example, improvements in education and health)."* Hence, the most important outcomes for the target population were not captured in the analysis.

Any analysis that could be conducted for the NDF investment would be based on the same type of data (carbon emissions and savings on kerosene/diesel) and would suffer from the same data gaps. and therefore, repeat this finding. A further complicating factor for this case is the scope for additionality. In the summary provided to the evaluation team, it was not clear whether the World Bank study included assessments of additionality. Whilst, little data will have existed to support quantitative assessments of these assumptions, it is worthwhile to explore the conditions under which the investment on NDF's part if likely to have been additional.

Additionality

Additionality measures the impact that a project has compared to doing nothing. Undoubtedly, ensuring universal access to modern energy services in health and water facilities in developing countries is an essential requirement for improving health and well-being. Indeed, the UN's Sustainable Energy for All initiative notes that health care facilities are a special focus on its community energy access agenda.[3] There is no doubt, therefore, that providing energy access to these facilities has merit. However, it is also one of many potential investments in the heavily constrained climate finance field. What assessing additionality asks is whether this is a valuable investment, when all things are considered.

Estimating additionality is very challenging. In an SROI analysis, adjustments are made for three factors that attempt to isolate the net effect: deadweight, attribution, and displacement. The latter is not relevant to this case study, but it is useful to consider how the former two might be relevant to better understand how NDF investments can be additional.

Deadweight is the most important of the concepts. It attempts to capture 'natural change', or the extent to which the outcomes would have happened anyway. For example, in this analysis, even if we had data on the health outcomes, we would need to know whether the determinants of those health outcomes, such as the cold storage of vaccines would have happened anyway, i.e. whether they were already being refrigerated using diesel generators. Findings from interviews suggest that lack of energy was indeed a problem. for example, the Ministry of Health informed the evaluation team that improved service delivery, maternity care, diagnostics and refrigeration were positive outcomes from the intervention. However, there is a likelihood that at least some of these being achieved via diesel generators, with implications for additionality. The key metric, therefore, is the difference in health outcomes before and after the installation of the PV system.

Attribution is an estimation of the proportion of the observed outcome that is the result of the intervention. There are two reasons to assume that the attribution to NDF is likely to be small. First, NDF is one of many actors involved, and much of the benefit must be attributable to the World Bank as the main financer and instigator of ERT II. Moreover, the project could not have happened without the involvement of the Ugandan government. The second factor is that there was little scope for NDF to influence the design or implementation of the project as they joined the project when it was already established. As discussed above, there was little contact with the World Bank and it is unlikely that NDF had much influence or catalytic impact. The main source of attributable benefit from NDF is the extension of the provision of solar PV systems to health centres and water supply schemes in nine new districts, which is somewhat modest.

To conclude therefore, for the nine districts that the NDF finance funded, the NPV is likely to be negative based on existing data, in line with the findings from the World Bank economic analysis. However, the range of outcomes included is narrow. which means that the NPV in reality would have been higher and potentially positive. However, this would be predicated on an assumption of low deadweight, i.e. low use of generators to provide electricity. It cannot both be true that there

[3] World Health Organization, Department of Public Health and Environment, Geneva, Switzerland

were substantial savings on diesel and kerosene and that health centres could not operate electrical equipment. Although stakeholders reported positively about the benefits and there may well be other benefits in terms of health impacts from using renewables in terms of reliability and cost,in the absence of rigorous measurement of the use of generators and comparable health outcomes, it is not possible to reach any conclusion on this. It should also be noted that the energy production is intermittent rather than continual and addressing this would require very expensive storage. It may well be the case that the facilities are still using generators alongside renewable energy.

A final caveat to this section is that the NPV will undoubtedly be very sensitive to the shadow price of carbon used. A full discussion on carbon valuation is beyond the scope of this study (see Case Study on African Guarantee Fund for some discussion on this), however it may well be the case that this project would have had a positive NPV based on carbon emissions were a higher estimate used (the figure used by the World Bank was not disclosed in the report that we saw). We discuss this again in the recommendations below.

Recommendations

There are four issues arising from this project for NDF.

1. Limited outcomes data. The project did not provide any quantitative data on the difference that the project made to the patients of health centres and the users of the water facilities. As the economic analysis shows, this is a critical piece of information that is required to adequately demonstrate the benefit of this project.

One way that NDF could have made an additional contribution to this project was by funding some research on the impact that the electricity had. This could have informed the rest of the project, were it possible to generalise for the wider investment. One approach might have been to employ a health economist to estimate impacts on Disability Adjusted Life Years (DALYS). These are easily monetisable and could be incorporated into the World Bank's economic analysis. Evidence on the quantity of DALYs that off-grid energy provides could be usefully employed in other evaluations and as a way of assessing the value of investing in similar projects in the future.

2. Limited evidence of additionality. Additionality, in all its forms is a core concept for NDF. The importance of this is well-demonstrated by this case study. The funding was a small add-on to a large World Bank funded project, and while it allowed for an increased coverage with additional health centres and water supply schemes reached, it did not bring in new elements or approaches. Whilst the engagement with larger donor partners enables NDF to latch onto their capacities and structures already put in place for project management, this project design could also limit the scope to influence or achieve catalytic change. The investment was also in the second phase of the project which was already established and would also gone ahead without NDF funding, albeit not in the nine additional districts funded by NDF. The implementation was done by the Government of Uganda through the project management structure already established with World Bank support. There is therefore substantial attribution to other actors. Moreover, there may be substantial deadweight on some outcomes due to the use of diesel and kerosene at baseline to power equipment.

We recommend building post hoc estimates of additionality into the project selection and board consideration processes. Efforts to measure additionality should also be used where possible. For example, had NDF evaluated the impacts on the health and water facilities, pre and post measures of the use of generators and/or health outcomes could be included. This links to a wider recommendation regarding knowledge management within NDF.

3. Limited engagement with the economics of climate change

A key point to take away from the economic analysis that was done, is that NDF (and the World Bank more generally), need to place far more emphasis on systematically obtaining evidence on the non-CO2 related benefits of these kinds of projects. This is particularly important given the scarcity of climate finance, and the need to ensure that resources are channelled to the areas where they can have the greatest impact. It may be that these are exactly those kinds of projects, but it may also be that more impact could be achieved by investing the money in other ways. Unless there is good, comparable evidence on the holistic (environmental, social and economic) impacts of projects, it is impossible to make this assessment. Central to these analyses is an appropriate, ideally country-specific shadow price for carbon and we recommend that NDF engage with this literature and adopt a valuation that it incorporates into any assessments of this kind.

4. Institutional/knowledge management

The completion report from the World Bank contains information that is not summarised in the closing report (e.g. institutional impacts on the ministries and the findings from the economic study) and it is not clear that the evaluation activities of the two organisations were well-aligned. We would recommend more formal processes for ensuring more collaborative evaluation and using those findings to inform closing reports. This is not just to address questions of project impact, but to inform future project selection and implementation and ensuring that lessons learned can contribute to the sum of institutional knowledge. A stronger link to the World Bank could have enabled a continued presence of NDF in the promotion of off-grid solar PV in Uganda and continued the cooperation with well-performing national partners. However, it can be It can be a challenge for NDF to maintain links and partnerships after project completion, due to the lack of an in-country presence.

Annexes

Annex 1: List of documents consulted

The documents reviewed are:

- NDF website
- World Bank website
- GEF website
- Board consideration (2009)
- NDF closing report (final and final draft) (2018)
- NDF mission back-to-office report (2017)
- World Bank (2017) Implementation, Completion and Results Report (unpublished)

Annex 2: List of persons interviewed

The interviews include:

- Charles Wetherill, NDF programme manager
- Written response to questionnaire from the Ministry of Water and Environment, Uganda
- Written response to questionnaire from the Ministry of Health, Uganda

Case Study C17 – Disaster Management and Climate Change Programme

List of Acronyms

Acronym	Meaning
EUR	Euro
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Greenhouse Gas
GNI	Gross National Income
IDB	Inter-American Development Bank
IDF	International Development Finance
IRR	Internal Rate of Return
MAGFOR	Ministerio Agropecuario y Forestal
MARENA	Ministry of Environment and Natural Resources
MTI	Ministerio de Transporte e Infraestructura
NDF	Nordic Development Fund
NGOs	Non-governmental Organizations
NPV	Net Present Value
PAGRICC	Programa Ambiental de Gestión de Riesgos de Desastres y Cambio Climático
POSAF	Socioenvironmental and Forestry Development Program
SDC	Swiss Agency for Development and Cooperation
SDR	Special Drawing Rights
SINAPRED	Sistema Nacional para la Prevención, Mitigación y Atención de Desastres
SROI	Social Return on Investment
UN	United
USD	United States Dollar

Background and context

About the Inter-American Development Bank (IDB)

Established in 1959, IDB is a multilateral development bank for Latin America and the Caribbean, providing financing mainly through lending. Being the largest source of multilateral development financing for this region, IDB provides financial and technical assistance vis-à-vis poverty and inequality reduction. IDB has 48 member countries, of which 26 are borrowing countries from Latin America and the Caribbean. IDB can on average provide USD 12 billion in loans annually. At end 2016, the capital of IDB was USD 171 billion. In its current strategy, IDB focuses on three "development challenges": social inclusion and equality, productivity and innovation, and economic integration; and on three cross-cutting issues: gender equality and diversity; climate change and environmental sustainability; and institutional capacity and the rule of law.

Background to Swiss Agency for Development and Cooperation (SDC)

SDC is the agency responsible for the implementation of the bilateral Swiss development cooperation. The activities of SDC aim to *reduce poverty and hardship, curb global risks, and promote development that preserves natural resources for future generations*. SDC focuses on fragile and conflict-affected regions and is South Cooperation Department operates in 21 countries and regions in Africa, the Middle East and Latin America and the Caribbean. SDC also provides funding for

multilateral organisations, including UN agencies, the World Bank and regional development banks. SDC's focal sectors in Nicaragua are Disaster risk reduction and climate change, governance, and economic development.

Background to the NDF investment

Being one of the poorest countries in Latin America and the poorest in Central America with a gross national income (GNI) per capita of USD 1,940 in 2015, Nicaragua is one of the three NDF focal countries in the region. NDF had prior to the project provided EUR 20 million in credits, EUR 29.3 million in SDR (special drawing rights) and EUR 2.2 million in grants to Nicaragua. Like the other regional development banks, IDB is a key partner for NDF. NDF consult with their existing partners, including IDB, on a regular basis and are made aware of new opportunities as they are being developed. In particular, NDF and IDB had co-financed the Socioenvironmental and Forestry Development Program (POSAF) in two phases (NDF provided USD 8 million). POSAF had a similar focus and approach, e.g. the promotion of agroforestry, albeit with less focus on climate change, a different geographical location, and with a use of NGOs rather than government agencies for the implementation at the community-level.

IDB was interested in the climate expertise and grant finance that NDF could bring, and proposed in 2010 to NDF to support the Nicaragua – Disaster Management and Climate Change Program (PAGRICC). The programme had been designed by IDB. Two years into implementation, SDC joined the project with additional grant.

The Nicaragua – Disaster Management and Climate Change Program (PAGRICC)

The implementing partner for PAGRICC (Programa Ambiental de Gestión de Riesgos de Desastres y Cambio Climático), is the Nicaraguan Ministry of Environment and Natural Resources (MARENA – Ministerio del Ambiente y los Recursos Naturales). PAGRICC aimed at enhancing the resilience of rural communities to climate change and disasters. The objective of PAGRICC was "*reduction of rural populations' vulnerability to natural disasters and increasing resilience of communities and watersheds to climate change impacts through planned adaptation measures*". To this end, PAGRICC had three components/outcomes:

1. Natural resource management with the aim of reducing disasters and adapting to climate change
2. Reduction of losses due to extreme weather
3. Development of climate change capacity, vulnerability mapping and payment for environmental services

Geographically, component 1 and 2 focused on the catchment of the Lake Apanás (hydropower reservoir) sub-watershed (612 km^2) and the Río Viejo Watershed (245 km^2), whereas component 3 worked both at the national level (capacity development for MARENA), and in the project area (capacity development for communities and municipalities).

Complementary information on context and needs

This section describes the context for the investment and need that it is responding to.

Vulnerability to weather-related natural hazards and climate change

Nicaragua is significantly affected by hurricanes, floods and droughts posing a risk to lives, houses, economic assets, infrastructure and agricultural production. Climate change is projected to further exacerbate the risk with increased frequency and magnitude of extreme weather events. Deforestation and land degradation has also exacerbated the hazard associated with extreme

weather, such as increased risk of landslides, inundation and water shortages. Moreover, the vulnerability is increased by poverty, with rural households having limited capacities to cope with the loss of productive assets. There is also insufficient institutional capacity vis-à-vis forecasting and responding to hazards. The World Bank estimates that 68% of Nicaragua's surface area and 67% of its Gross Domestic Product (GDP) are vulnerable to hazards.

Overall, Nicaragua is among the most vulnerable countries to the impacts of climate change. It ranks as the sixth most vulnerable country on the long-term climate risk index for 1998-2017 (measured as the countries being most affected by extreme weather events), with 45 extreme weather events during the period causing a loss of 1% of the GDP (https://www.germanwatch.org/en/16046).

Environmental degradation

Economic development, population growth and poverty has led to an increased demand for and increased pressure on Nicaragua's natural resources, e.g. with clearing of forests to make room for agriculture and livestock raising. Nicaragua has experienced significant deforestation (see table 1), the main driver being clearing for agriculture (www.globalforestwatch.org).

Table 9 Forest cover in Nicaragua

Year	Forest area	Percentage of total land area
1990	4,514,000 ha	37.5%
2000	3,814,000 ha	31.7%
2010/2016	3,114,000 ha	25.8%

Source: http://www.fao.org/faostat/en/#data

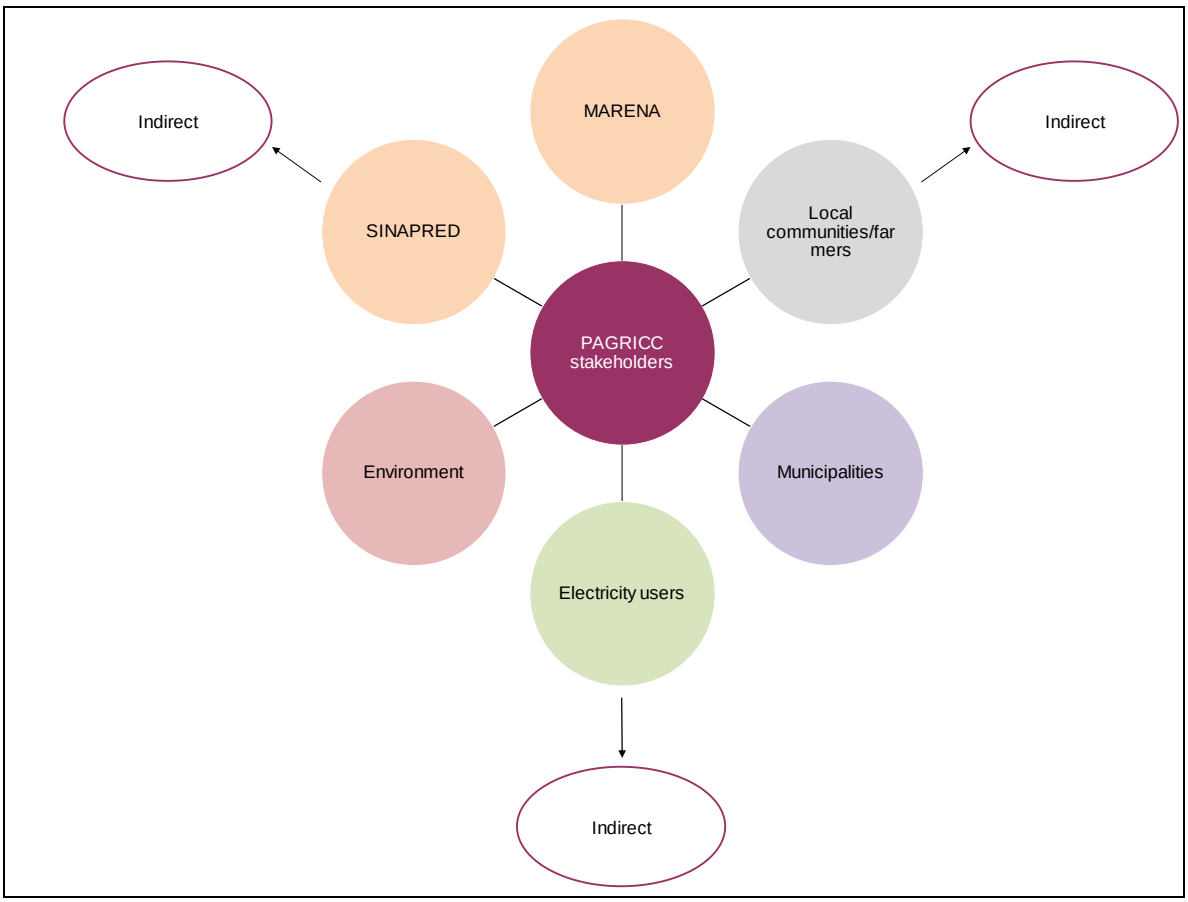
This has led to loss of biodiversity and land degradation, increased erosion and declining soil fertility, which in turn negatively affects agricultural productivity and the livelihoods of rural households depending on natural resources for their livelihoods. As mentioned above, land degradation has also enhanced the risk of weather-related hazards. Moreover, the increased erosion is causing siltation of downstream water bodies, including hydropower dams, thereby negatively affecting the power generation potential. Deforestation also releases carbon to the atmosphere, thereby contributing to climate change. An estimated 128 megatonnes of CO_2 were emitted in 2001-2017 as a result of loss of tree cover in Nicaragua (www.globalforestwatch.org).

Stakeholder mapping and NDF's role in the project

Stakeholder mapping

In this section, we map the project stakeholders and for each group identify the key outcomes that are expected. Figure 2 sets out the stakeholder map.

Figure 2 Stakeholder map



The main direct beneficiaries are MARENA (the Ministry of Environment and Natural Resources) and communities. As the implementing partner for the project, MARENA was responsible for the procurement and implementation of all activities. MARENA benefited from the access to capital and capacity development (skills and methodologies) for the implementation of actions related to its mandate as the lead ministry for environmental protection and climate change, including enhanced climate forecasting and planning capacities.

Communities/farmers were engaged in activities that increased, and diversified agricultural production, including tree planting and soil conservation measures, and thereby benefitted from increased incomes and resilience. Moreover, the communities benefited from infrastructure measures that a) protect them and their assets from floods (most beneficiary communities were in vulnerable locations), b) store water for the dry season/periods of drought, and c) provide access during the rainy season, e.g. to markets, schools and healthcare. The communities also benefitted from improved disaster management. While the project benefited both men, women and children, the project did not specifically address gender issues. Moreover, initially, the targeting of beneficiaries for component 1 was not pro-poor, due to requirements of having minimum 10 acres of land which prevented the participation of smallholders, but the criteria were later adjusted to

allow for the participation of smallholders as a result of pressure from SDC to strengthen the poverty reduction angle and inclusiveness of the project.

Seven municipalities were involved in the development of local/municipal disaster management plans and the selection of infrastructure projects and beneficiary communities, although the implementation on the ground was mainly led by the local/territorial delegations of MARENA, and benefited as the project enhanced their capacity to prevent and management disasters and improved the livelihoods of their constituencies. The municipalities are responsible for the maintenance of the infrastructure constructed.

The government agency for disaster management (SINAPRED – Sistema Nacional para la Prevención, Mitigación y Atención de Desastres) participated in selection of critical sites for infrastructure.

The environment benefited from reforestation and agroforestry activities, which reportedly contributed to increasing the biodiversity and most likely also to reduced surface run-off and erosion. The tree planted also sequester carbon, thereby contributing to climate change mitigation.

People provided with electricity generated from Lake Apanás most likely benefited indirectly from the project. The improved soil management and increased tree cover probably reduced erosion, which in turn would reduce the siltation of Lake Apanás. This in turn, would have reduced the negative impact of siltation on the water storage capacity of the lake, and thereby on the hydropower generation capacity.

NDF's role in the project

The first project component (Natural resource management with the aim of reducing disasters and adapting to climate change) promoted soil and water conservation, reforestation, agroforestry and climate-resilient agriculture (against drought and floods). The second component focused on the construction of infrastructure to enhance climate change and disaster resilience, such as small-scale hydraulic infrastructure to protect production systems and settlements from floods and bridges and fords to ensure that communities that had previously been isolated during the rainy season would have year-round access, e.g. to markets, schools and health services. The third component focused on capacity development for MARENA and communities vis-à-vis disaster management and risk reduction vis-à-vis this component included climate change forecasting the development of management plans, vulnerability mapping, establishment of community disaster management committees, technical studies and training.

NDF provided a grant of EUR 2.5 million for the project in 2011-2016, IDB provided USD 13 million and SDC provided funding corresponding to USD 4 million. NDF's grant was provided directly to the Government of Nicaragua, who was responsible for all procurement and implementation. NDF's funding was provided for PAGRICC component 2 (infrastructure for climate resilience) and component 3 (capacity development, studies, climate modelling, risk management plans). NDF also funded the M&E system including the baseline, monitoring consultant missions, the mid-term review and the final evaluation. SDC and IDB also provided funding for component 2. Component 1 (natural resource management) was fully financed by IDB and SDC.

Outcome analysis

In this section we map the main outcomes for each stakeholder and describe each outcome and how it is expected to be achieved.

Table 10 Outcome map

Stakeholder	Short-term outcome	Medium/long-term	Description
MARENA	Increased capacity to forecast climate change and hazards	Improved prevention and management of climate-related disasters	Disasters emanating from hurricanes, floods, drought
	Increased capacity to promote sustainable and climate resilient land-use practices	More effective promotion of environmental protection by MARENA	Practices: improved soil management, increased tree cover, diversified production
Communities (direct)	Improved and sustainable agricultural productivity	Increased incomes from increased yields and new agricultural products	Practices: improved soil management, agroforestry, increased tree cover,
	Diversified and climate-adapted agricultural production	Enhanced resilience/reduced vulnerability to weather hazards and impacts of climate change	Wider range of agricultural products/crops reducing crop losses due floods and drought
	Protection of homes and productive assets from floods	Enhanced resilience/reduced vulnerability to weather hazards and impacts of climate change	
	Improved access to water – increased agricultural productivity	Increased incomes from increased yields and new agricultural products	
	Improved access to services (e.g. health services, schools) and markets during rainy season	Improved education of children through year-round attendance, better health, increased access to purchasing goods and increased incomes from selling products at markets throughout the rainy season	Improved connectivity with bridges and roads that are usable and safe during rainy season
	Increased capacity of local response committees and community-members to prepare for, and respond to, weather hazards	Enhanced resilience/reduced vulnerability to weather hazards and impacts of climate change	
Municipalities	New local infrastructure for improved access and protection from floods	Improved service delivery to constituency	Walls, drainage channels, gabions, bridges, fords
	Disaster relief plans and increased capacity of municipal response committees to respond to weather hazards	Improved prevention and management of disasters	
Electricity users (indirect)	Reduced siltation of Lake Apanás hydropower reservoir due to reduced erosion as a result fo improved soil management and increased tree cover	Reduced risk of reduced electricity generation capacity and power shortages	the water storage capacity of the lake, and thereby on the hydropower generation capacity.
Environment	Increased tree and forest cover (indigenous species), and reduced forest fires (due to reduced burning of fields)	Increased biodiversity	
	Restoration of soil fertility and reduced erosion	Improved hydrological integrity (more consistent and even water	

Stakeholder	Short-term outcome	Medium/long-term	Description
		flow), more reliable access to water, less risk of flood damage during rainy season and water shortages during dry season	
	Sequestration of carbon in trees/vegetation and GHG emissions prevented	Increased mitigation of climate change	

Details on main outcomes achieved

The final evaluation provides the following data on the main outcomes achieved by PAGRICC, derived from the monitoring data collected by the project.

Increased agricultural productivity and incomes

304 communities with 4,895 farmers received financial incentives and training in natural resource management/environmental restoration. 'Agroforestry and soil conservation' was introduced on 560.98 ha. **c**

4,483 water collection (water harvesting) structures were constructed with a total capacity of harvesting 286,912 m^3 of water. In total, 311,375 m^3 of water were harvested in 2013-2016, benefitting the 4,895 participating farmers.

Farmers reported the following benefits of the natural resource management activities: energy (firewood) and timber trees available in their farms, improved soil fertility and water retention, increased availability of water. The yields/agricultural production increased by more than 18%, and in 2016, the production value was USD 853.20 per ha compared to USD 720,20 per ha in 2012, thereby increasing the farmers' incomes from selling agricultural products and the availability products for their home consumption. Farmers also reported an increased availability of livestock fodder.

Based on the incomes generated from the farms, a 15-year economic evaluation of the investments in natural resource management is positive with a total positive net present value (NPV) of USD 2,186,844.01 and a 21% internal rate of return (IRR) (compared to the 12% discount rate), and a 1.43 cost-benefit ratio. A sensitivity analysis with a 10% reduction in project benefits showed an NPV of USD 1,461,389.80 an IRR of 18%, and a 1.20 cost-benefit ratio.

Improved resilience

48 infrastructure projects were completed (11 funded by NDF), protecting 140 sites vulnerable to floods and 49,794 persons. This includes walls, drainage channels and gabions[4] to protect people and assets from floods, and bridges and fords to ensure that otherwise isolated communities could safely access the outside world during the rainy season, e.g. to reach markets, schools and health centres.

Based on an assessment of avoided direct costs, A 10-year economic evaluation of a sample of 33 infrastructure projects implemented by PAGRICC (those funded by IDB, not those funded by NDF or SDC) is overall positive with a total positive NPV of USD 3,575,330.23 and a 34% IRR (compared to the 12% discount rate), and a 1.78 cost-benefit ratio.

Municipal and community disaster management committees were strengthened through training and the development of local disaster management plans. Municipalities were provided with tools and skills for disaster risk reduction. Climate forecasting provided information on future hazard

[4] a basket or cage filled with earth or rocks (Merriam-Webster), which can be used to reduce the runoff speed of water to reduce its force or as protection walls

risks and vulnerable locations. Legal regulations were developed for payment for ecosystem services, but it is unclear whether they have been put to use.

Reduced environmental degradation and sequestration of carbon

The forest cover in upper catchment was improved with an increased tree cover on 22,090 ha; Moreover, there was a significant reduction in forest fires due to reduced burning of fields. The increased tree cover with indigenous species is also reported to have increased the biodiversity in the project area, but no data is available on this.

As described under section "Details on outcomes achieved", the project improved the soil fertility and water retention and introduced agroforestry and thereby increased the tree cover on 560.98 ha of agricultural land. Erosion most likely also reduced, but no data is available.

6,642,836 plants were provided for reforestation, and 2,013,376 plants were provided for agroforestry, the assumed plant survival rate was 80%. 91% pf the participants were satisfied with the quality of the plant material provided.

No data is available on the carbon sequestered by the increased tree cover.

Communities and municipalities received environmental awareness training, but there is no data on the extent to which or how this changed their behaviour.

Details on contribution to outcomes (incl. NDFs' leverage)

NDF contribution to projects

NDF engaged a consultant to provide technical support and advice, e.g. vis-a-vis procurement, for PAGRICC and other NDF co-financed projects. This according to partners enabled a stronger engagement of NDF than what would have been possible from Helsinki. The NDF programme manager also carried out missions to Nicaragua to follow up on PAGRICC and other NDF projects.

NDF and SDC played a proactive and central role in ensuring that issues related to the quality of the infrastructure, e.g. due to an insufficient budget ceiling (the costs of the infrastructure had been significantly underestimated in the project design), were handled by insisting that the initial budget allocation per infrastructure project was increased according to needs rather than a pre-defined standard ceiling, even if this would mean a reduced number of infrastructure projects. This ensured that infrastructure projects could be dimensioned according to their purpose and specific context and could be completed. SDC subsequently increased its grant funding for component 2, to enable the infrastructure targets of PAGRICC to be largely reached despite the increased costs.

Moreover, NDF's funding of the capacity development, climate forecasting/scenarios, local disaster management plans, and promotion of methodologies and tools under component 3 made a significant contribution to the quality of the other components, e.g. by guiding the selection of project sites and infrastructure projects. NDF influenced the procurement of consultants/expert inputs for component 3 (capacity development) by insisting that a) instead of having several smaller contracts, fewer and larger contracts would facilitate procurement and supervision, and b) that international experts should be mobilised to ensure that international best practice was brought (e.g vis-à-vis climate forecasting) in instead of relying only on Nicaraguan consultants.

The advantages of providing the grant directly to the Government was that NDF had a direct involvement in and influence on, the project. But at the same time, the separate funding stream limited the extent to which IDB resources and in-country presence could be mobilised to supervise the utilisation of NDF funds, although IDB also did some follow-up on infrastructure financed by NDF (IDB managed the SDC funding). Had IDB been responsible for managing the NDF funds, then IDB would have been formally responsible for supervising the planning, procurement and

implementation of NDF-funded infrastructure projects. Reportedly, this also created some confusion among Nicaraguan stakeholders that the money came through two different streams with differences in the procurement processes, which worked against the perception and management of PAGRICC as a single project.

Leverage

NDF's involvement helped motivate SDC to join the project although SDC would most likely have joined in any case as a result of their dialogue with IDB, which filled a financing gap vis-à-vis the intended infrastructure under component 2 (the costs of constructing infrastructure in remote rural areas had been underestimated in the initial project design), and allowed for an increase in the volume of infrastructure constructed.

Findings on additionality/complementarity

The grant support from NDF enabled the inclusion of capacity development and technical studies, such as the climate forecasting, and the monitoring and baseline studies. This would not have been feasible (to the same extent) for IDB to cover with loan financing.

Initially, the Government planned to use only national experts for the capacity building and studies under component 3, but NDF's funding for component 3 and dialogue with the Government led to the inclusion of international expertise, best practices and methodologies.

NDF also funded a comprehensive monitoring system for the entire project with a baseline, monitoring missions, a mid-term review and a final evaluation. NDF also funded a participatory evaluation, where beneficiary views and perspectives were gathered, which had been requested by SDC.

Findings on other issues

Alignment with mandate

The project was aligned with NDF's mandate in several ways. As described in section "Details on outcomes achieved", PAGRICC focused specifically on addressing climate change adaptation and promoting resilience and to a lesser extent addressed mitigation, while promoting improved livelihoods and poverty reduction through increased and resilient rural income generation. The project thereby embraced an integrated approach, which addressed both environmental, economic and social concerns.

It also promoted innovation, in terms of promoting the integration of climate change considerations in infrastructure development and the promotion of resilient livelihoods.

However, the project cannot not be classified as high risk nor did it target private sector development.

Alignment to partner priorities

Historically, there has been a significant Nordic engagement in Nicaragua, which for example previously was a Danida programme country. The focus on climate change adaptation and poverty reduction, as well as sustainable agriculture and forestry is also well aligned with the priorities and expertise of Nordic countries. It also, as anticipated, fulfilled Nordic interests by utilising Nordic consultants in cooperation with local companies. However, while the project did benefit women and children with the increased resilience and incomes, the project did not specifically address gender issues, which are a Nordic priority.

PAGRICC was also fully aligned with the mandates of the IDB and SDC. PAGRIIC responded to the focus that IDB has on productivity and innovation, climate change and environmental sustainability, and institutional capacity. It also responded to the aims of SDC to reduce poverty and hardship and preserve natural resources for future generations.

Moreover, the project was overall well aligned with MARENA's mandate vis-à-vis environmental protection and climate change and its capacity development needs.

However, the government line entities responsible for agriculture and forestry (MAGFOR – Ministerio Agropecuario y Forestal) and infrastructure (MTI – Ministerio de Transporte e Infraestructura) were not involved in the project or only involved in "*a marginal way*". MARENA under PAGRICC implemented agroforestry, reforestation and transport infrastructure activities, which fall under their mandates rather than MARENA's mandate.

Experience with private sector

PAGRICC was implemented by the Government and funded by international development, and not with private sector partners. NDF directly engaged a consultant to support PAGRICC and other NDF funded projects in Nicaragua, and to enable NDF to follow the projects more closely. Private companies were contracted by MARENA with NDF funding for the construction of infrastructure and delivery of agricultural inputs. Consultants were also engaged by MARENA with NDF funding to carry out capacity development, studies and monitoring and evaluation tasks.

Catalytic effect

As mentioned in section "Leverage", NDF's involvement motivated SDC to provide grant funding for the project, although it is probable that SDC would have joined PAGRICC in any case.

Nicaragua and IDF referred to PAGRICC as a co-financing source, which thereby contributed to leveraging GEF (Global Environment Facility) funding for climate adaptation.

Moreover, the approaches, methodologies and tools introduced by PAGRICC for climate forecasting, infrastructure project selection, and improved soil management and land use have reportedly been internalised by MARENA and replicated in other projects.

Nordic 'value added'

NDF added Nordic value by financing the involvement of international/Nordic experts, e.g. in the monitoring and evaluation, including the baseline methodology development.

SROI Summary

The contribution of NDF is assessed at 50% (medium), following the informal categorisation provided in the table above and based on stakeholder interviews and the final evaluation. While specific infrastructure can be directly attributed to NDF funding, and NDF support played an instrumental role for the capacity development component and the monitoring, the other funding partners made equally significant contributions to the outcomes, e.g. the natural resource management outcome can be attributed to IDB, and specific infrastructure can be attributed to either SDC or IDB.

Assessment of data quality and gaps

Data gaps/quality related to outcomes (incl. contribution to outcomes)

Overall, there is a fairly comprehensive availability of monitoring data and information (qualitative and quantitative) at the outcome level, but with some gaps, e.g. in relation to: a) financial efficiency of NDF-funded infrastructure, b) carbon sequestration, c) biodiversity, and d) erosion.

Table 11 Evidence matrix

Stakeholder	Short-term outcome	Data availability
MARENA (direct)	Increased capacity to forecast climate change and hazards	Qualitative information available. Quantitative data is available at the output level (e.g. number of plans, number of people trained)
	Increased capacity to promote sustainable and climate resilient land-use practices	Qualitative information available. Quantitative data is available at the output level (e.g. number of people trained)
Communities (direct)	Improved and sustainable agricultural productivity	Data available on the production value per ha and percentage increase
	Diversified and climate-adapted agricultural production	Qualitative information available. Quantitative data is available at the output level (number of people trained)
	Protection of homes and productive assets from floods	Data available for the 33 IDF funded projects on the number of people and sites protected – but not for the 11 NDF funded projects
	Improved access to water – increased productivity	Data available on a) the water storage capacity installed, b) the volume of water harvested, and c) the production value per ha and percentage increase.
	Accessibility during rainy season	Qualitative information available.
	Better organisation and capacity to respond to weather hazards	Quantitative data is available at the output level (number of people trained)
Municipalities (mainly indirect)	New local infrastructure	Quantitative data is available on the number of infrastructure projects constructed.
	Disaster relief plans and increased capacity of municipal response committees to respond to weather hazards	Qualitative information available. Quantitative data is available at the output level (number of people trained, number of plans prepared)
Electricity users (indirect)	Reduced siltation of Lake Apanás hydropower reservoir	No data available.
Environment	Restoration of tree cover and forests (habitats)	Quantitative data is

Stakeholder	Short-term outcome	Data availability
		available (ha)
	Restoration of soil fertility and reduced erosion	Qualitative information is available, but no quantitative data.
	Sequestration of carbon in trees/vegetation and GHG emissions prevented	No data available, not covered by the project indicators.

Data gaps/quality related to other issues

There were some challenges related to fulfilling the evaluation standards and requirements of IDB. Some stakeholders perceive the combination of monitoring and evaluation in a single contract with the same consultants was sub-optimal and that these two aspects should have been separated to ensure a fully new and independent perspective of the evaluators. Moreover, most of the resources had been spent on the monitoring, leaving insufficient resources for the final evaluation compared to IDB's requirements.

Lessons learnt

From interviews:

1 The provision of grants directly to the national implementing partners comes with the benefit of enabling a direct dialogue with the implementing partners and influence on how the project is implemented and procurement is handled.

2 A disadvantage of providing grants directly to the implementing partners instead of providing the grant to co-funding partners (such as IDB or SDC) is that NDF cannot fully latch on to their in-country presence and capacity to supervise implementation and provide technical support to the national implementing partners. It can also create a sense of NDF funding a separate project, rather than a single joint project.

3 The lack of in-country presence of NDF poses a limitation to how deeply NDF can engage with implementing partners and influence the project; engaging an in-country consultant can at least partly mitigate this challenge and add further value by helping the implementing partners, e.g. with issues related to procurement processes and adhering to NDF requirements and expectations.

4 Combining project monitoring and project evaluation into a single contract appears not ideal, as it can a) mean that the evaluator is not fully independent from the project (and cannot evaluate the quality of the monitoring system), and b) that limited resources remaing available in the contract for the final evaluation.

Annexes

Annex 1: List of documents consulted

The documents reviewed are:

- NDF website
- IDB website
- SDC website
- Board consideration (2010)
- NDF closing report (2017)

- Final evaluation (2017)

Annex 2: List of persons interviewed

The interviews include:

- Aage Jørgensen, NDF programme manager
- Marion Pommelec, IDB programme manager
- Duval Llaguno, previous IDB programme manager
- Miriam Downs, SDC programme manager
- Luisa Gamez, former MARENA staff member
- Denis Fuentes, former MARENA staff member
- Ileana Holt, consultant supporting and NDF portfolio in Nicaragua
- Jacob Kronik, lead consultant, NDF-funded consultant contract for baseline, monitoring, mid-term review and final evaluation

Case Study C34 – Nordic Partnership Initiative Pilot Programme

List of Acronyms

Acronym	Meaning
COP	Conference of Parties to the United Nations Framework Convention on Climate Change
CSI	Industry-led Cement Sustainability Initiative
GHG	Greenhouse Gases
GoV	Government of Vietnam
IEA	International Energy Agency
MRV	Measurable, reportable and verifiable
NAMA	Nationally Appropriate Mitigation Actions
NDF	Nordic Development Fund
NEFCO	Nordic Environment Finance Corporation
NOAK	Nordic working group for global climate negotiations
UNFCCC	United Nations Framework Convention on Climate Change
WCA	World Cement Association

Background and context

Key data

Name: **Nordic Partnership Initiative Pilot Programme**; Ref: NDF C34

Country: Vietnam

Approved NDF grant: EUR1.5 million; disbursed EUR1.39 million

Total cost projected at inception: EUR1.6 million; co-financing GoV: EUR0.1 million (in-kind)

Board approved: November 2011

Project implementation: May 2013 (grant agreement between NDF and GoV) – October 2016. There was a 2-year delay between board approval and project implementation due to procedural issues at government of Vietnam level.

Implementing agency: The Ministry of Construction (MOC), Department of Science, Technology and Environment [Vietnam]

Partner agency: no partner agency. This was a rare case in which NDF did not have a partner agency. NDF had originally planned to have the Asian Development Bank (ADB) has partner agency, but the ADB had no project the Nordic Partnership Initiative Pilot Programme could be attached to.

Background to the project

Nordic Partnership Initiative

The project was realised under the Nordic Partnership Initiative, launched in 2010 (then called NOAK-NEFCO Partnership Initiative) to explore new finance options under the international climate architecture, and to pave the way for cost-efficient and effective implementation of scaled-

up nationally appropriate mitigation action (NAMAs). The Initiative was initially a partnership between the Nordic Working Group for Global Climate Negotiations (NOAK) and the Nordic Environment Finance Corporation (NEFCO). It started with a feasibility study in January 2011, completed in August 2011, which explored the potential for supporting the preparation of a pilot crediting scheme in Peru focusing (waste sector) and Vietnam (cement sector). The component concerning Peru was financed by NEFCO. NEFCO did not have the resources to also finance the component concerning Vietnam and this component was therefore proposed to NDF for financing.

The aim of the Initiative was to demonstrate how innovative international climate finance solutions can achieve sector wide greenhouse gas emission reductions in developing countries. The Initiative complemented the international climate policy of the Nordic countries and forms part of their efforts to stay at the forefront of effective climate mitigation action. The mission was to explore and demonstrate how developing countries can prepare and propose NAMAs within the framework of the United Nations Framework Convention on Climate Change (UNFCCC) for a particular economic segment. The Initiative illustrated how these actions could be supported and enabled by technology, financing and capacity building, and how these actions could be measured, structured and matched with international climate finance as well as with existing and possible new market mechanisms.

The objective of the Vietnam project was to improve Vietnam's readiness to benefit from international climate financing by scaling up mitigation actions in the cement sector.

The Pilot Programme in Peru's waste sector

Unlike the Vietnam Pilot Programme, the Peru Pilot Programme had two stages as "the successful partnership and availability of funds enabled a second stage of collaboration (2016-2018) to build further on its initial achievements" (Nordic Council of Ministers, 2018). According to NOAK and NDF, no immediate follow-up financing could be secured for the Vietnam Pilot Programme.

The NAMA Readiness Programme for Peru initially had an implementation period of two years (2013-2015) and thus a second stage of collaboration (2016-2018). The goal of Phase II of the NPI in Peru was to fine-tune the NAMA activities. The NPI collaboration was concluded in summer 2018. Six different consultancy assignments were commissioned under Phase II covering financing landfill mitigation, creating a market for compost, further developing the SIGERSOL information system, recycling and possibilities for international cooperation under Article 6 of the Paris Agreement (Nordic Council of Ministers, 2018[5]).

Nationally Appropriate Mitigation Actions (NAMAs)

Nationally Appropriate Mitigation Actions (NAMAs) are voluntary actions targeting effective climate change mitigation in developing and transition countries, which will result in reduced greenhouse gas emissions across different sectors. According to the Bali Action Plan and its agreed outcome in the Conference of Parties to the UNFCCC (COP), developing countries should consider the implementation of Nationally Appropriate Mitigation Actions in the context of sustainable development, supported and enabled by technology, financing and capacity building, in a Measurable, Reportable and Verifiable (MRV) manner.

The Cancun Agreements in 2010 reinforced the notion, stating that NAMAs should aim to achieve a deviation from Business-As-Usual (BAU) emissions in 2020, and NAMAs seeking international support shall be recorded in a registry and subject to international MRV. At the

[5] Nordic Council of Ministers (2018) Climate action in Peru. Nordic support for waste sector management yields results, https://norden.diva-portal.org/smash/get/diva2:1262894/FULLTEXT01.pdf

Durban conference in 2011, relevant decisions were also made on issues. At the COP 19 in Warsaw limited progress has been observed related to NAMA and COP 21 in Paris showed that NAMA development continues, while implementation still lags behind (UNFCCC, 2016).

The NAMA concept is built on the following general elements: [6]

- *Nationally appropriate*. NAMAs should be appropriate for the national circumstances and development needs of the developing country.
- *Sustainable development*. NAMAs should promote the country's sustainable development.
- *Support*. NAMAs can access to developed country support (technology, finance, and capacity building).
- *Measurable, reportable, and verifiable (MRV)*. The NAMAs (and the support from developed countries) are subject to international or internationally defined MRV.
- *Deviation from business-as-usual (BAU) emissions*. Unlike Clean Development Mechanism, NAMAs go beyond offsetting; instead of merely relocating mitigation action to developing countries, NAMAs must result in net emission reductions or implemented policies and measures which are expected to lead to measurable emission reductions in the (developing) host country.

National partner agency - Ministry of Construction (Vietnam)

The Ministry of Construction (MOC) of Vietnam was the partner agency for the Pilot Programme in Vietnam. The MOC is a government ministry responsible for, among others: 1/ state administration on construction, building materials, urban and rural construction planning, urban infrastructure, public services and 2/ representing the owner of state capital in state-owned enterprises – amongst them the state-run cement plants.

National context - the cement sector (Vietnam)

The cement sector was the target group for the Pilot Programme. Much of the Vietnamese cement industry is overseen by the Vietnamese Cement Industry Corporation and (VICEM) and the Vietnam National Cement Association (VNCA). VIECEM directs much of the largely state-run industry with installed capacity estimated to 45% of cement production in Vietnam, and 35% share of the domestic market. The Vietnam National Cement Association (VNCA) represents about 60% of the industry.

Before the Programme, there was no regulation in place on the monitoring and reporting of CO2 emissions in the cement sector. Although all plants provided general information on gas emissions in periodic reports to the environmental authorities, data on CO2 emissions was not regularly monitored and recorded (Norden, 2015). In 2011, Vietnam adopted the "Master Plan for Development of the Cement Industry for the 2011-2020 period, with a vision to 2030" under Decision No.1488/QD-Ttg by the Prime Minister. The Plan suggests that during this time the country's cement production will again double from 59 million tons in 2013 to 125 million tons in 2030. The Master Plan for the Development of the Cement Industry showed a strong desire by the government to replace cement imports by domestic production in a sustainable way.

Complementary information on context and needs

Cement sector and climate change

According to the Carbon Brief (2018), the cement industry in Vietnam generated around 2.8bn tonnes of CO_2 in 2015, equivalent to 8% of the global total – a greater share than any country other

[6] Information from the Feasibility Study on Up-Scaling Mitigation Action in Peru and Vietnam; August 2011.

than China or the US. Cement use is set to rise as global urbanisation and economic development increases demand for new buildings and infrastructure.

Around half of the emissions from cement are process emissions arising from the production of clinker. This is the principal reason cement emissions are often considered difficult to cut: since this CO_2 is released by a chemical reaction, it cannot be eliminated by changing fuel or increasing efficiency. A further 40% of cement emissions come from burning fossil fuels to heat kilns to the high temperatures needed for this calcination process. The last 10% of emissions come from fuels needed to mine and transport the raw materials.

To bring the cement sector in line with the Paris Agreement on climate change, its annual emissions will need to fall by at least 16% by 2030. Yet at the same time, cement is expected to play a vital role in the expansion of the built environment, especially in emerging economies. On a 'business as usual' trajectory, global cement production is set to increase to over 5 billion tonnes a year over the next 30 years. Well-known barriers stand in the way of deep decarbonization of cement. The sector is dominated by a handful of major producers, which are cautious about pioneering new products that challenge their existing business models. In the absence of a strong carbon-pricing signal, there is little short-term economic incentive to make changes. Alternative materials are often not readily available at the scale required (Lehne & Preston 2018).

The International Energy Agency (IEA) and the industry-led Cement Sustainability Initiative (CSI) released a low-carbon roadmap,[7] showing how it considers emissions can be cut. The roadmap relies on four areas of action for these emissions cuts. Three of these are the strategies previously being pursued by the cement industry to limit emissions, namely, improved energy efficiency, lower-emission fuels and lower clinker ratios. The fourth area is "innovative technologies". Under the CSI, producers accounting for 30% of global cement production have worked together for around two decades on sustainability initiatives, including emissions reductions. At the Paris climate conference, the group announced plans to reduce its collective emissions by 20-25% by 2030 (Carbon Brief 2018). The World Cement Association (WCA) released a Climate Action Plan[8] in 2018, highlighting five areas of collective action to tackle climate change.

Vietnam context

According to the NDF Board document, the cement sector is the biggest emitter of industrial greenhouse gases (GHG) in Vietnam. The sector's emissions arise from two main sources: directly from the cement production process (process emissions), and indirectly from fossil fuel combustion to generate heat and electricity for the production process (energy-related emissions). There are currently approximately 50 cement plants and 100 production lines in Vietnam with a total capacity of 57 million tons of cement. Demand for cement has been increasing by 10% annually, and it is projected to rise to up to 105Mt by 2020 and 126Mt by 2030 according to the draft Master Plan for Cement Sector Development. According to a recent study funded by the Danish Embassy, cement sector emissions were approx. 40 Mt CO_2e in 2010. Emissions are projected to increase by up to 15 Mt from the 2010 level by 2020. Emission reduction potential has been estimated to be around 3.5Mt CO_2e annually by 2020, including electricity, coal and fuel oil savings. Inclusion of a wider range of mitigation activities would increase the mitigation potential further.

Stakeholder mapping and NDF's role in the project

[7] https://www.iea.org/publications/freepublications/publication/TechnologyRoadmapLowCarbonTransitionintheCementIndustry.pdf

[8] http://worldcementassociation.org/sustainability/the-wca-climate-action-plan

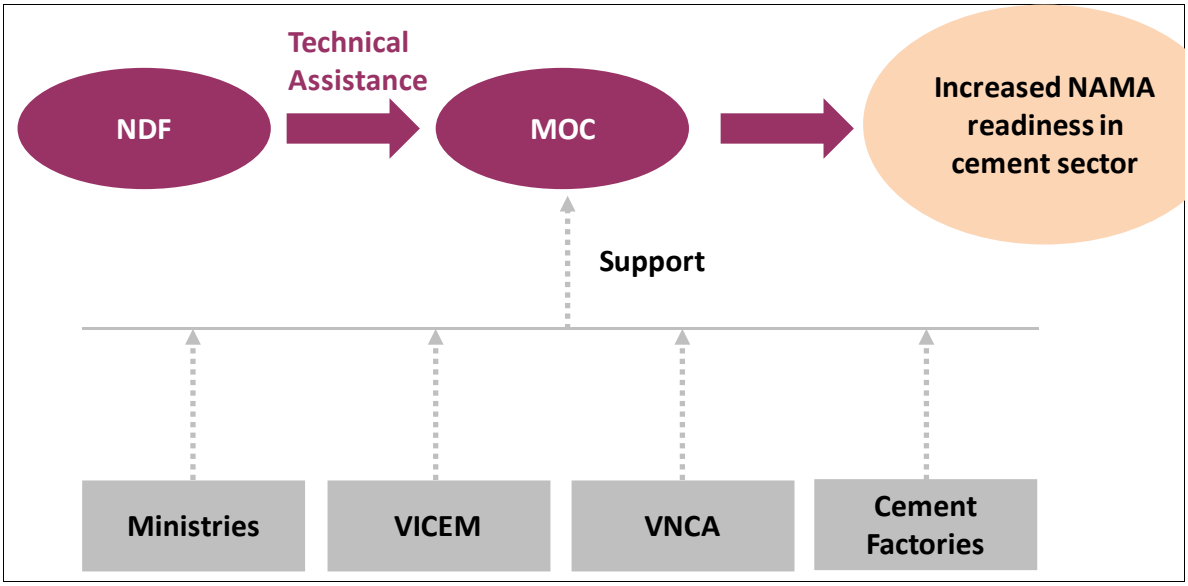
2.1 Stakeholder mapping

Nordic Partnership Initiative: This was a partnership between the Nordic Working Group for Global Climate Negotiations (NOAK) and the Nordic Environment Finance Corporation (NEFCO). As described earlier, the Nordic Partnership Initiative initiated the Pilot Programme based on a feasibility study of August 2011 and developed the ToR for the programmes. The project in Vietnam was then proposed to NDF for financing. The initiative formed a project group to oversee and monitor the programmes in Peru and Vietnam. The project group reviewed the deliverables from the consultant consortium, ensuring that the programmes were in line with purpose of initiative.

Since NEFCO managed the sister project in Peru, NDF and NEFCO informed each other of the progress and joined forces at the COP side events to present the Pilot Programmes and share knowledge with stakeholders of the international climate arena.

Figure 3 shows an overview of the key stakeholders and their relations at project level in Vietnam. Each stakeholder is described in more detailed below.

Figure 3 Key stakeholders Nordic Partnership Initiative Pilot Programme Vietnam



Source: Inception report, 2014

Main stakeholders:

NDF: financier; was in charge of reviewing the process and providing necessary approvals in close cooperation with NOAK and – to a more limited extent – NEFCO.

Consultant consortium: The Technical Assistance to the MOC was provided by a consortium of consultants. The consortium consisted of 5 companies – NIRAS (lead), South Pole, Perspectives, VNEEC and NIRAS-(RCEE_NIRAS).

Ministry of Construction (MOC), Department of Science, Technology and Environment [Vietnam]: The MOC was the implementing agency, receiving support and input from relevant ministries and the parties of the cement industry. The ministry was responsible for ensuring that the proposed NAMA recommendations were country-driven and in line with Vietnam's national priorities and strategies.

Ministries/National Steering Committee: [also referred to as Project Steering Board] Comprised of representatives of key ministries in Vietnam (Ministry of Science and Technology, Ministry of

Trade and Industry, Ministry of Investment and Planning, Ministry of Natural Resources and Environment). The committee provided inputs to the MOC and coordinated the collaboration and sharing information within relevant ministries.

Cement companies/ cement industry: Represented by Vietnam Cement Industry Corporation (VICEM) and the Vietnam National Cement Association (VNCA). Collaboration with these was facilitated by the MOC.

In addition, the following stakeholders were of relevance:

Advisory Group: Comprised of representatives of the ADB, World Bank, Nordic and Vietnamese stakeholders to facilitate collaboration at international level. According to the NDF Board document the objective was to "*to ensure sufficient exchange of views between all key stakeholders during the implementation of the project*". The Advisory Group supported the development of the ToR for Technical Assistance delivery to the MOC, provided comments on main deliverables and had joined COP events for sharing lessons learned from the Pilot Programme at international level.

Government of Vietnam: The NAMA would count as a part of Vietnam's contribution under the UN Framework Convention on Climate Change (UNFCCC).

Private sector & public sector stakeholders: to finance the actual NAMA.

Environment: NAMAs should lead to a reduction of GHG emissions and climate change mitigation.

Project outputs and NDF's role in the project

Project outputs

The objective of the project was to **improve Vietnam's readiness to benefit from international climate financing by scaling up mitigation actions in the cement sector**.

This was implemented through a relatively small (EUR1.5m) TA project, with the following expected **activities/ outputs**:

1. Set up data and MRV system of international standards for NAMA readiness
    a. Collection of updated sector data on emissions, technologies, costs and mitigation potential;
    b. Development of baseline emission projections for a range of scenarios;
    c. Development of MRV system of international standards; and
    d. Development of data systems and institutions for regular collection of data.
2. Identify and design appropriate support instruments for mitigation actions
    a. identification of schemes/ policy mix which addresses financial barriers and facilitates enabling investment environment, potential sources of international (supported and/or credited) climate financing for cement sector mitigation, mechanisms for funding, criteria for support, and MRV needs.
3. Identify and address technical, information, and capacity barriers
    a. design of proposals for addressing technical, information, and capacity barriers (at cement companies, public officials, cement associations...) via e.g. targeted training, manuals, and case studies.

According to the NDF closing document, all outputs were delivered as expected. This is corroborated by the consultants' completion report, the existence of the technical reports (outputs) available as well as the conducted interviews for this case study. The following outputs were delivered:

A total of **26 technical reports** were produced.

A total of **29 consultation meetings/ workshops** were organised with various stakeholders. A total of four training workshops were organised at four different locations with the participants from cement companies located in different regions of the country. Two study tours were carried out. Altogether, 28 site-visits have been made to different cement plants in Vietnam for consultations and assessments.

The final report, which built on the other technical reports, was the "**Final Readiness Plan for the Cement Sector in Vietnam**". The key findings / recommendations from the project were linked to five areas: 1) Database and MRV, 2) Baseline and mitigation options, 3) Legal and institutional framework, 4) Financing arrangements, and 5) Stakeholder engagement and capacity building. Based on these five areas, a proposal for a roll-out of the Readiness Plan was made by the Consultant to the Implementing Agency. This key report contains NAMA proposal for the cement sector in Vietnam, including a financing plan as well as proposal for policy mechanism to overcome the barriers for the implementation of mitigation measures.

The cement NAMA project established a **database** for Vietnam's cement sector and defined main components of the NAMA conceptual framework which includes baseline and mitigation options, MRV set-up, legal and institutional framework and financing arrangements.

With the framework of the cement NAMA, **12 key nationally appropriate mitigation actions have been identified** under a "Best Available Technology and Practice" scenario and were proposed to be implemented starting from 2016. If all these mitigation actions are implemented, they are estimated to reduce emissions by 138-166 Mt CO2e by 2030. The required investments for implementing these mitigation actions by 2030 are estimated at USD 1.8 billion plus USD 15 million for enabling activities. These investments are expected to bring cost savings of around USD 8-10 billion by 2030.

NDF role

NDF managed the Vietnam Pilot Programme and financed the TA grant. NDF was in charge of reviewing the process and providing necessary approvals in close cooperation with the Nordic Partnership Initiative. NDF was the main link between the consultants and the Nordic Partnership Initiative, overseeing the overall progress. NDF was in charge of coordinating the different inputs from the Nordic Partnership Initiative and the Advisory Group on deliverables.

Outcome analysis

Outcome mapping

The project is specific in that **no outcomes were explicitly expected to be achieved** in the course of the project. The project was a TA assignment defined by its outputs, as outlined in section "Project outputs" The expected implementation period was 2018-2030.

The outcomes of the project are those that were in principle facilitated by this TA and can be inferred from the 'overall objective' and activities of the project; these however have not been monitored or reported on after closing of the project.

The overall objective of the Readiness Programme was to strengthen Vietnam's capacity to prepare, propose and implement a full-scale scheme of a clearly specified NAMA in the cement sector. The NAMA Proposal identified the most promising options to mitigate greenhouse gas emissions in the sector and should enable Vietnam to attract international climate finance through the carbon market and other channels, along with support in the form of technology transfer and capacity building (Norden, 2015).

Nordic Partnership Initiative: The aim of the Nordic Partnership Initiative was to demonstrate how innovative international climate finance solutions can achieve sector wide greenhouse gas (GHG) emission reductions in developing countries. The Initiative aimed to share lessons learned from the Pilot Programme with the international climate forum.

Government of Vietnam: The NAMA would count as a part of Vietnam's contribution under the UN Framework Convention on Climate Change (UNFCCC), part of the overarching nationally determined contribution (NDC) of Vietnam. Vietnams unconditional contribution is to reduce GHG emissions by 8% below business-as-usual (BAU) in 2030 . Vietnam intends to achieve this target by reducing emissions intensity of GDP by 20% compared to 2010 levels and increasing the forest cover to 45%. The target could be increased to a reduction of 25% given sufficient international support. In this case, emission intensity would be reduced by 30% compared to 2010 levels.[9]

Ministry of Construction: Programme aimed to build capacity of the Ministry of Construction to enable Vietnam to prepare for a full-scale Nationally Appropriate Mitigation Action (NAMA) in the cement sector. The NAMA would count as a part of Vietnam's contribution under the UN Framework Convention on Climate Change (UNFCCC). The NAMA plan would not only achieve emission reduction but also further co-benefits and other effects.

Ministries/National Steering Committee: The aim was to enable collaboration between the ministries, build capacity and knowledge of policy, legal and institutional barriers to overcome barriers to mitigation actions to enable the implementation of the NAMA Plan. The Ministries of Natural Resources and Environment, of Planning and Investment and of Finance also play an important role in the implementation of the actual NAMA. The set of enabling activities are required to ensure that cement plants have proper incentives and a well-defined legal and institutional framework, within which to undertake the necessary investments.

Cement Industry: The aim of the Pilot Programme was to build capacity and knowledge of, amongst others, best practices in the cement sector to incorporate climate and energy efficiency considerations into the sector's decision-making and attract further financing.

The recommended actions in the NAMA Readiness Plan focused on mitigation options that not only reduce GHG emissions but also generate cost savings for participating cement plants.

The mitigation measures include:

Short-term Action (2016 - 2020): improving operational efficiency and introducing EE practices: 1a) Knowledge on the process, management and control; and 1b) Energy audit; 2) Mixing process: Pozzolana; 3) Mixing process: Limestone

Mid-term Action (2021 – 2025): 4) Modern automation and monitoring system; 5) Improve the clinker coolers; 6) Improve the modern multi-channel combustion chamber; 7) Mixing process: Coal slag as cement substitute; 8) Mixing process: Ash as cement substitute; 9) Waste-heat recovery system for power generation; 10) The best technologies available for other fuels to replace fossil fuels

Long-term Action (after 2025) 11) Adding pre-calorifier equipment to the existing pre-heating system; 12) Adding the preheating towers.

Private sector & public sector stakeholders: The mitigation actions identified under the NAMA Readiness Programme require a total investment volume of USD 1.8 billion between 2015 and

[9] Umweltbundesamt (2017) Implementation of Nationally Determined Contributions – Vietnam Country Report. https://www.umweltbundesamt.de/sites/default/files/medien/1410/publikationen/2017-10-26_climate-change_25-2017_country-report-vietnam.pdf

2030. Since many of the mitigation actions are economically attractive for the cement companies, private sources should be the main source of NAMA finance. The idea was that funding from international donors or the carbon market would be sought to put in place the enabling activities, to finance pilot projects and to create incentive schemes that are able to catalyse investments by the cement industry. Such incentives could be designed in the form of preferential loans, performance guarantees or as results-based payments, where companies receive payments based on the demonstrated energy savings or GHG emission reductions they have achieved (Norden, 2015).

Environment

Reduce GHG emissions, climate change mitigation. The goal was an emissions reduction of 20 MtCO2e by 2020 and 164 MtCO2e by 2030.[10]

Table 12 Summary table for the outcome mapping

Stakeholder	Short/medium-term outcome	Medium/long-term outcome	Description
Nordic Partnership Initiative	Increased knowledge sharing from implementation of NAMA readiness in the cement sector in Vietnam	Improved sector-wide GHG emissions reduction in other developing countries	Facilitate the development of NAMAs worldwide by demonstrate how innovative international climate finance solutions can achieve sector-wide GHG emission reductions in Vietnam (and Peru).
Government of Vietnam	Improved implementation of Nationally Determined Contributions (NDCs)	Increased CO2 emission reduction and improved sustainable development at national level	The NAMA would count as a part of Vietnam's contribution under the UN Framework Convention on Climate Change (UNFCCC).
Ministry of Construction	Improved capacity for NAMA development	Improved ability to facilitate implementation of NAMA and enable the achievement of co-benefits and other effects	The capacity building was one of the main components of the NAMA readiness plan. Co-benefits and other effects envisioned by the NAMA readiness Plan were: Reduce fossil fuel consumption Reduction of land use for landfill Create more jobs and increase income Improve health of the population, air quality, quantity and quality of Wastewater Promote Technology transfer, hence technology autonomy.
	Improved access to data from cement plants on e.g. emission and energy usage	Improved ability to identify potential mitigation areas in cement sector	The database and MRV system were supposed to lead to improved reporting from cement plants, enabling the ministry to take more informed decisions on mitigation actions.
	Improved enabling legal and policy framework,	Improved sustainable cement production	As part of the NAMA readiness plan, the existing policies and legal framework were

[10] NDF (2016) https://www.ndf.fi/sites/ndf.fi/files/attach/iii-3_final_readiness_plan_report_0.pdf

Stakeholder	Short/medium-term outcome	Medium/long-term outcome	Description
	Improved enabling activities		analysed, and recommendations given to create an enabling environment for the implementation of the actual NAMA, e.g. develop regulations on management of waste and infrastructure and develop a financial incentive policy for GHG emission mitigation actions.
Ministries	Improved capacity for NAMA development	Improved ability to implement NAMA in the cement sector	The capacity building and collaboration was one of the main components of the NAMA readiness plan.
	Improved collaboration and knowledge of policy, legal and institutional barriers for NAMA implementation	Improved enabling policy, legal and institutional environment to implement NAMA in the cement sector	Before the NAMA readiness plan, ministries had little collaboration and knowledge of barriers to implement the actual NAMA.
Cement industry	Improved capacity and knowledge regarding possible mitigation actions in cement production and improved mainstreaming GHG reduction targets and mitigation measures into cement industry development planning	Improved energy efficiency and cost savings and improved mitigation of carbon emissions	The cement plants increased their knowledge, amongst others, on Best Available Technologies and Practices, and feasible mitigation measures that are applicable to Vietnam
Private sector & public sector stakeholders	Increased private sector financial support towards the implementation of the NAMA proposal and Increased public financing for the Implementation of NAMA in the cement sector	Improved NAMA implementation in the cement sector	With the right knowledge and many investments being inherently attractive, private sector finance should follow. Next to private sector financing, international climate finance should fund investments to further catalyse private sector investments.
Environment	Emissions avoided.	Climate change mitigation	Goal: Estimated emissions reduction of 20 MtCO2e by 2020 and 164 MtCO2e by 2030[11]

Details on main outcomes achieved

The main outcomes described below come from grey literature review and internet searches as well as the email answers from the Ministry of Construction. The available data is, however, scattered. According to NDF, this is partly due to the lacking international system to track (financial) contributions to NAMAs and as most of the information as well as the key persons in Vietnam are not accessible/fluent in English.

[11] NDF (2016) https://www.ndf.fi/sites/ndf.fi/files/attach/iii-3_final_readiness_plan_report_0.pdf

Knowledge sharing

According to NDF and NOAK, lessons learned from the Pilot Programme were shared at COP side events.

Improved implementation of Nationally Determined Contributions (NDCs)

According to a country report on Vietnam's NDCs (Bundesamt, 2017), the development of concrete mitigation activities the country was still in early stages. The country had received support from various donors, including BMUB, FAO, UNDP, JICA and others, to build up capacity for NAMA design and the setting up of corresponding MRV systems. Back then, most activities were preparatory, with the identification of potentials, co-benefits, design of MRV systems and general capacity building.

Two years later - considering the currently financed activities based on the NAMA readiness plan (see section "Improved mobilisation of private and public funding to implement the NAMA") - this still seems to be the case to some extent. According to the MOC, most publicly financed activities are still research or and benchmarking in the cement sector. Nevertheless, there are also some concrete activities already being implemented (see section "Improved capacity and knowledge" and section " Improved mobilisation of private and public funding to implement the NAMA").

In the document of UNFCCC (2015) describing the "Intended Nationally Determined Contribution of Vietnam"[12], the cement sector was not featured. Two years later it, however, featured in the country report on Vietnam's Nationally Determined Contribution (Bundesamt, 2017). According to NDF, it is thanks to their financing that that the cement sector now features prominently in Vietnam's effort to reduce CO2 emissions.

Improved capacity (all Ministries and cement industry)

As the capacity component was for all ministries and the cement industry, the closing report addressed the improved capacity of all stakeholders together. Nevertheless, the closing report offers only very vague assessment of the capacity building component:

A large number of persons can be estimated to have been impacted directly and indirectly by the project, although it is not possible to quantify the number of persons affected. The persons affected can be expected to have obtained improved skills to develop NAMAs and MRVs and awareness about how to carry out similar activities in the future.

Vietnam is assessed to have now greater capacity to develop similar activities in the future, and the government can use the framework as a tool for decisions makers when they select future mitigation actions for the cement sector. Also the database and the MRV systems are assessed as useful tools for baseline and results monitoring that may be needed for national or international financing for mitigation and for monitoring and reporting on Vietnam's NDC (Nationally Determined Contributions).

From the interviews, it can be inferred that the Ministry of Construction is further putting the readiness plan into action, using the capacity gained during the Pilot Programme.

[12] UNFCCC (2015) Intended Nationally Determined Contribution Vietnam. https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Viet%20Nam%20First/VIETNAM%27S%20INDC.pdf

Increased access to data from cement plants

A comprehensive sub-sector level MRV system has been developed with two components: (i) the MRV of GHG emissions (including 29 monitoring/ progress indicators); (ii) the MRV of non-GHG-emissions indicators including the co-benefits and impacts at two levels: factory level and sub-sector/industry level (10 progress indicators).[11]

Improved enabling policy and legal framework and enabling activities

The improved enabling policy and legal framework was relevant in several areas. There is some evidence that the framework is improved upon.

- According to a newspaper article of May 2019, the Ministry of Construction will coordinate with the cement industry to ensure the implementation of the cement industry development plan in Vietnam for the 2021-2030 period with the orientation to 2050 once it is approved. Accordingly, the development of large capacity lines (around 5,000 tonnes per day) will be the priority to maximise the efficiency of the plants. (Nhan Dan, May 2019[13]).The focus on larger cement plants and Energy Efficiency was one of the recommended enabling activities mention in the NAMA readiness plan.
- According to another newspaper, the Government issued Document No 4721/VPCP-CN (not available in English) in May 2018, asking the ministries of construction and finance to come up with solutions to improve the efficiency of natural resources, energy and labour productivity in the cement industry as well as limiting exports. This aims to make the cement industry focus more on the domestic market for sustainable development. (Vietnam Plus, May 2018[14]).
- Also in May 2018, the Government asked the construction ministry to design a development strategy for the cement industry to 2030, to ensure balanced supply and demand. According to the newspaper Nhan Dan (May 2019), the cement market has arranged itself to operate more stably, so the situation of supply exceeding demand has basically been controlled. The development of policy incentives for balancing cement capacity with demand was also recommended as enabling activity in the NAMA readiness plan. To what extent the supply and demand has been balanced thanks to policy incentives or other factors is, however, not clear.
- In addition, the ministry would enhance the application of science and technology to reduce production costs, promote energy and resources savings, and reduce the environmental impact of cement production (Vietnam Plus, May 2018).
- Sustainable development of the cement sector is mentioned in Vietnam's latest 5-year plan (2016)[15].

To effectively implement the MRV system it was necessary to establish a legal obligation for all cement companies to participate in the MRV, while improving quality and credibility of the current in-plant monitoring practices. It is not clear whether this legal obligation has been established.

Improved collaboration and knowledge of policy and institutional barriers

From the interviews, it can be inferred that the collaboration between the ministers has been successful and that knowledge of barriers has improved.

[13] Newspaper Nhan Dan (May 2019) https://en.nhandan.org.vn/business/item/7046302-measures-for-sustainable-development-of-cement-industry.html

[14] VietnamPlus (May, 2018) https://en.vietnamplus.vn/domestic-cement-industry-to-face-more-pressure/143127.vnp

[15] Socialist Republic of Vietnam (2016) The five-year socio-economic development plan 2016-2020. http://pubdocs.worldbank.org/en/839361477533488479/Vietnam-SEDP-2016-2020.pdf

Improved capacity and knowledge regarding possible mitigation actions in cement production and improved mainstreaming GHG reduction targets and mitigation measures into cement industry development planning

The improved capacity of all stakeholders, including the cement industry, is described in section "Improved capacity". From the interviews it can be inferred that the cement industry gain knowledge of, amongst others, best practices in the cement industry through field visits and that the cement industry was motivated to implement recommendations given in the NAMA readiness report. There was no indication, however, on what was actually implemented from the TA recommendations by the cement sector after 2016. Nevertheless, there is some indicative evidence in Vietnams reporting of the cement industry.

- VICEM General Director, Bui Hong Minh, said in May 2019 that the corporation has set synchronous measures to ensure its growth, including solutions to reduce costs (notably power costs), ensure the efficiency of existing lines, improve working productivity and promote investment to expand production capacity. The corporation also paid much attention to environmental protection, towards meeting European environmental standards as well as the enhancement of the use of ash and slag from thermal power plants into cement production and energy saving through pilot waste incineration for kilns. Regarding exports, VICEM steadfastly pursues the strategy of exporting mainly cement and limiting the exports of clinker to enhance the optimal efficiency (Nhan Dan, May 2019).
  One of the main recommendations in the NAMA readiness was to " reduce the sector average content of clinker in cement from the current 83% to about 69%, making a portfolio of cement products with more slag, fly ash, pozzolana and limestone as main constituents" (p.35). Although the content of clinker is not yet being reduced, reducing the exports is to some extent in line with the recommendation.
- The power plan 'Xuan Thanh Cement' has awarded FLSmidth a contract to deliver equipment for a brownfield cement production line in Ha Nam province in Vietnam. The contract has a value of around DKK 550 million. FLSmidth will design and engineer the new clinker production line and deliver energy-efficient equipment for the entire production from crushing to clinker silo. Jan Kjaersgaard, President, Cement, FLSmidth said the following about the contact: *"We are very pleased to continue our engagement with Xuan Thanh Cement. It is rewarding to work with a customer that combines a strong focus on reliable and efficient production with the* ***ambition to minimise its environmental impact****. Our cooperation shows that when you focus on total cost of ownership, you can get* ***energy-efficient equipment that lowers emissions*** *without compromising productivity.*" (Globanewswire, March 2019[16]).
- In 2018, UNDP launched the procurement of consultants for the "Detailed Energy Audits for the preparation of Nationally Appropriate Mitigation Action (NAMA) Support Project for the cement sector in Viet Nam (Ref. 2-180302)." The objectives were: To conduct Detailed Energy Audits and to prepare the Energy Audit Reports for five cement factories, as part of formulation of the National Appropriate Mitigation Action (NAMA) for the cement sector in Vietnam. The procurement document directly refers to the "Pilot Programme for Supporting Up - scaled Climate Change Mitigation Action in Vietnam's Cement Sector" implemented by MOC and funded by the Nordic Development Fund (NDF) as basis for the financed energy audits.

[16] Globnewswire (March, 2019) FLSmidth to deliver new cement production line in Vietnam https://www.globenewswire.com/news-release/2019/03/29/1788249/0/en/FLSmidth-to-deliver-new-cement-production-line-in-Vietnam.html

Improved mobilisation of private and public funding to implement the NAMA

According to the Ministry of Construction, the following actions are currently financed based on the NAMA readiness plan, indicating that international public funding has been mobilised to some extent:

UNDP is developing a proposal to seek for funding from the NAMA facility, based on the NAMA readiness plan. Total amount in the proposal is estimated at 19.5 million USD. The financial instrument proposed is soft loan for Energy efficiency projects (focusing on Waste to Heat Recovery (WHR)). To implement a Waste to Heat Recovery system was one of the recommended mitigation actions featured in the NAMA readiness plan.

VLEEP (a project funded by USAID) is supporting MOIT to develop an energy benchmarking for cement sector, using the CSI CO2 and Energy Protocol in the NAMA cement project.

There are several researches/initiatives related to MRV and ESCO by the Ministry of Construction according to NAMA readiness plan.

The World Bank[17] is supporting some researches related to waste use as alternative fuel for cement sector.

Regarding private sector, there are some indications of further financing in the cement sector:

DKK 550 million contract for FLSmidth to design and engineer the new clinker production line and deliver energy-efficient equipment (see section "Improved capacity").

Emissions avoided

No information available.

Details on contribution to outcomes (incl. NDFs' leverage)

The evidence of outcomes is limited and patchy. Nevertheless, if any outcomes have been achieved, NDF can claim high contribution given it was the major financier of the project. The interviewees assessed NDF's contribution to be 'quite high'.

Table 13 Assessment of NDF's contribution

Level	Meaning	Score
High	Outcome is completely the work of NDF	100%
Quite high	The outcome is a small part due to the work of other organisations	75%
Medium	Other organisations have a significant role	50%
Quite low	The outcomes are mostly as a result of other organisations	25%
Low	The outcomes are entirely due to the work of other organisations	0%

NDF did not play a role in initiating the project. The ToR for the implementation of the Pilot Programme were designed by the Nordic Partnership Initiative. While the early work was done by others, NDF did have the necessary country experience which, according to interviewees, greatly benefited the implementation and was one of the reasons the Pilot Programme was considered a success. NDF's achievement to engage an entire sector, ensure ownership and facilitate cooperation between a large variety of stakeholders to be able to accomplish the development of a

[17] World Bank, https://www.greenclimate.fund/documents/20182/574760/Funding_Proposal_-_FP071_-_World_Bank_-_Vietnam.pdf/d00a38b5-445f-67c5-2140-5b2988c919a3

Readiness Plan at sector level has been emphasised in all interviews. NDF also influenced the implementation, for example, when deciding for an implementing agency. According to the interviewees, the idea was first to involve Ministry of natural environment and resources. But when they submitted the concept note and NDF did their due diligence, NDF decided to involve the Ministry of Construction as implementing agency.

There was no agreement among the interviewees whether the Pilot Programme would have gone ahead without NDF's financing. According to NOAK, however, the Nordic Partnership Initiative would have sought to find other financing partners, but also stressed that this would have been difficult since few financing partners were willing to finance such a new concept as NAMAs were back in 2013.

An important aspect stressed by interviewees was the fact that not many financiers are both flexible and have the necessary sound country knowledge that is needed for the successful implementation of such programmes. NDF's sound in-country knowledge facilitated the successful implementation of the Pilot Programme. According to the Board Document and the interviewees, NDF's involvement in the project since September 2011 ensured that the project's local ownership in Vietnam was reinforced.

Regarding leverage, there are indications of further financing of activities based on the information provided by the Ministry of Construction. These are based on the NAMA readiness plan which means that NDF can claim contribution. According to the MOC, these activities are still in early stage, mostly research or proposals being developed (see section "Improved mobilisation of private and public funding to implement the NAMA"):

Interviewees also stressed that NDF itself did not manage to secure follow-up financing immediate after the project closure although this was expected by the involved stakeholders. NDF could not finance follow-up investments itself (probably due to lack of partner agency) and other financiers did not materialise although NDF was highly involved in discussions with potential financiers.

Findings on additionality/complementarity

Additionality: this is a TA grant to a public sector institution; non-financial (developmental) additionality can be assumed. Interviewees agreed that NDF played an important role, especially when compared to the size of the institution. NDF had the ability to finance smaller programmes with potential for catalytic effects. It was also highlighted that NDF can be efficient and could achieve a lot and NDF should continue to be catalytic investor.
Complementarity: Originally, the Asian Development Bank was foreseen to be the Partner Agency for, which was foreseen to further strengthen the harmonization and synergies of these two projects. According to the Board Document, this was supposed to facilitate the harmonisation with the project "Support to the National Target Program on Climate Change with a focus on Energy and Transport" (TA-7779) funded by NDF through the Asian Development Bank (ADB), in a way that involves other actors supporting mitigation. This did, however, not materialise as there were no projects the Pilot Programme could be attached to.

Findings on other issues

Alignment with mandate

Addressing poverty reduction and climate change challenges in an integrated way: According to the board documents, the project was relevant for NDF's mandate as it targeted mitigation measures. The creation of co-benefits (such as job creation) are part of NAMAs and the MRV that was developed included the co-benefits and impacts at two levels: factory level and sub-sector/

industry level (10 progress indicators). It is not clear to what extent these progress indicators are monitored and acted upon by the Ministry of Construction.

Absorbing high risks: NDF was able to take the financial risk of this project. The project was risky as NAMAs at the time of project implementation were still a new concept and the involved stakeholders did not know what the project would be able to achieve and if further international support was likely. In addition, the project was sensitive as Vietnam subsidised energy prices which was not in line with reducing emissions.

Promoting innovation: According to the interviewees, supporting NAMAs back then was innovative; in that sense NDF funding was well placed to test and pilot a NAMA readiness plan which was the first worldwide NAMA plan for the cement sector.

Promoting private sector development: The project secured involvement of cement sector in NAMA design and there was a clear linkage between private and public sector through the stakeholder engagement plan that was part of the NAMA readiness plan.

Alignment to partner priorities

The host countries and sectors had been selected by NOAK and NEFCO based on consultation and discussions with the host countries themselves. These discussions took into consideration the countries' stated priorities of climate mitigation at national and sector level. Emphasis was put on having nationally appropriate NAMA recommendations. To do so, local ownership and local engagement was reinforced by giving an appropriate Vietnamese ministry the role of Implementing Agency and having an appropriate stakeholder engagement plan in place. All interviewees agreed that NDF succeeded in promoting local ownership and succeeded in facilitating collaboration between the stakeholders.

According to NDF's Board Document, the Pilot Programme mirrored the Nordic countries' climate and development priorities at that time. Gender was, however not a specific focus of the Pilot Programme.

Experience with private sector

The experience with the private sector as investor is not relevant for this case study.

Catalytic effect

See section additionality and NDF's contribution to outcomes incl. leverage effect.

Nordic 'value added'

The NDF's Board Document lists three ways in which Nordic value was added to the Pilot Programme – all of which can be said to have materialised:

The Nordic Partnership Initiative complemented the international climate policy of the Nordic countries.

The initiative was a joint effort by the Nordic countries to utilise Nordic experience from climate change mitigation and carbon market mechanisms.

Nordic consultants (NIRAS) with sector knowledge in the required areas of expertise were employed.

What specifically the Nordic added value entails, was not entirely clear to interviewees; according to NOAK, for example, it is spreading values such as transparency and doing development in a collaborative way, ensuring local ownership.

Assessment of data quality and gaps

Data gaps/quality related to outcomes (incl. contribution to outcomes)

- NDF played crucial role in kick-starting NAMA, some indication of catalytic effect and leverage but little information to support claims.
- Vague assessment of short-term outcomes such as improved capacity by NDF/consultants. No data collection/monitoring done at end of project to support claims; no assessment of sustainability issues, i.e. will capacity stay within ministry?
- MOC was not willing to share any reports or contact data and was only willing to answer the interview questions in writing. NDF, NOAK and NIRAS indicated that it could be due to the language barrier as well as culture. It was said that Vietnamese often do not speak English well enough to feel comfortable speaking and generally will not share information/knowledge that they have not officially been authorised/allowed to share.

Data gaps/quality related to other issues

- Also, NDF highlighted the challenge to follow the development in Vietnam, as most of the information (as well as the key persons) are not accessible/fluent in English.

Annexes

Annex 1: List of documents consulted

Project documents

Board document, final consideration, November 2011
Grant agreement between Socialist Republic of Vietnam and Nordic Development Fund, May 2013
Inception report, May 2014
Quarterly report Feb-Apr 2014
Quarterly report May-Jul 2014
Quarterly report Aug-Oct 2014
Quarterly report Nov-Dec 2014
Mid-term report Mar-Dec 2014
Quarterly report Jan-Mar 2015
Quarterly report Apr-Jun 2015
Progress report July 2015 – January 2016 and plan for finalisation of the contract
Completion report Jun 2016
Final Readiness Plan for the Cement Sector in Vietnam [P-III.3], October 2016
NDF closing report, May 2018

NDF project-related websites (accessed 12 April 2019)

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Context
Carbon Brief (2018): Why cement emissions matter for climate change;
https://www.carbonbrief.org/qa-why-cement-emissions-matter-for-climate-change
Lehne, J. & Preston, F. (2018): Making Concrete Change: Innovation in Low-carbon Cement and Concrete, Chatham House Report;
https://www.chathamhouse.org/sites/default/files/publications/2018-06-13-making-concrete-change-cement-lehne-preston-final.pdf
PBL Netherlands Environmental Assessment Agency & European Commission Joint Research Centre (2016): Trends in global CO2 emissions: 2016 Report;
http://edgar.jrc.ec.europa.eu/news_docs/jrc-2016-trends-in-global-co2-emissions-2016-report-103425.pdf

Annex 2: List of persons interviewed

Organisation	Stakeholder sub-category	Contact person	Position during project implementation
NDF		Martina Jägerhorn	Project Manager
NIRAS	Collaborators	Mr. Morten Pedersen	International Director, Climate Change and Energy, Team Leader of the Consultancy relating to NDF C34
NIRAS Vietnam (RCEE-NIRAS JSC)	Collaborators	Mr. Ha Dang Son	Technical Deputy Team Leader of the Consultancy relating to NDF C34
Swedish Environmental Protection Agency	Collaborators	Ms Sara Almqvist	Chair of the NOAK PG (Nordic working group for global climate negotiations' Project Group)
Ministry of Construction, Vietnam	Local partner organisation	Ms Luu Linh Huong	Project Coordinator for the Implementing Agency of NDF C34, Department of Science Technology and Environment

please note that Ms Luu Linh Huong only provided answers by email.

Case Study C40 – Emerging and Sustainable Cities Initiative

List of Acronyms

Acronym	Meaning
CAF	Development Bank of Latin America
CEF	Connecting Europe Facility
ESCI	Emerging and Sustainable Cities Initiative
EUR	Euro
FINDETER	Financial Corporation for the Territorial Development
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Greenhouse Gas
GIZ	German Society for International Cooperation
ICF	International Community Foundation
IDB	Inter-American Development Bank
JICA	Japan International Cooperation Agency
NADBANK	North American Development Bank
NDF	Nordic Development Fund
OSSE	Observing Connecting Europe Facility
PAGRICC	Programa Ambiental de Gestión de Riesgos de Desastres y Cambio Climático
SDC	Swiss Agency for Development and Cooperation
SDR	Special Drawing Rights
SECO	State Secretariat for Economic Affairs
SROI	Social Return on Investment
SUBDERE	Subsecretaría de Desarrollo Regional y Administrativo
USD	United States Dollar

Background and context

Key data

Name: **Emerging and Sustainable Cities Initiative**; Ref: NDF C40

Country/Region: Latin America (with a focus on Bolivia, Nicaragua and Honduras)

Approved NDF grant: EUR 2.1 million

Board approved: 13 December 2011

Project implementation: 2011-2016

Partner agency: IDB

Co-financing: IDB

Implementing agency: IDB

Emerging and Sustainable Cities Initiative (ECSI)

ECSI was launched in 2012. The main implementing partners were the municipal authorities in the participating cities. ECSI supported the development of **city action plans** for sustainable development including the identification of **priority investment projects**. The approach of ESCI was based on **three pillars**: a) environmental and climate change sustainability, b) urban sustainability, and c) fiscal sustainability and governance. For NDF, the main objective of the engagement in ESCI was to develop climate strategies and identify climate change adaptation and mitigation projects. ESCI had **five components**:

Identification and characterization of climate impacts and vulnerabilities as well as the measurement of GHG (inventories) and their impacts in the beneficiary cities;

Development of a methodology to identify, prioritize and select sectors and actions specifically relevant to foster adaptation to climate change, as well as sectors and activities that allow significant reduction of GHG;

Implementation of the developed methodology to prioritize and select the relevant sectors and actions (filtering);

Identification of specific investment projects derived from the prioritization exercise developed in Components (2) and (3), which will be incorporated in the Action Plans for the beneficiary cities; and development of at least one project per city at the prefeasibility level with estimated investment resources required for their potential execution in the beneficiary cities;

Design and implementation of citizen monitoring systems in beneficiary cities.

ECSI supported 71 medium-sized cities across several Latin American countries. Of these, NDF funded three cities: Cochabamba (Bolivia), Managua (Nicaragua) and Tegucigalpa (Honduras). The total budget for ESCI in 2011-2016 was USD 69.3 million.

The Inter-American Development Bank (IDB)

Established in 1959, IDB is a multilateral development bank for Latin America and the Caribbean, providing financing mainly through lending. Being the largest source of multilateral development financing for this region, IDB provides financial and technical assistance vis-à-vis poverty and inequality reduction. IDB has 48 member countries, of which 26 are borrowing countries from Latin America and the Caribbean. IDB can on average provide USD 12 billion in loans annually. At end 2016, the capital of IDB was USD 171 billion. In its current strategy, IDB focuses on three "development challenges": i) social inclusion and equality, ii) productivity and innovation, and iii) economic integration. The strategy entails three cross-cutting issues: i) gender equality and diversity; ii) climate change and environmental sustainability; and iii) institutional capacity and the rule of law. IDB provides mainly loans, but also grants from different trust funds at its disposal.

Other donors

In addition to IDB and NDF funding, the programme was co-funded by several donors. Funds were to a large extent executed by IDB, which managed funds from the following donors: a) NDF, b) The Global Environment Facility (GEF), c) the Japanese Ministry of Finance and the Japan International Cooperation Agency (JICA), d) the Swiss Agency for Development and Cooperation (SDC) and State Secretariat for Economic Affairs (SECO), e) the Austrian Ministry of Finance, and f) the Development Bank of Latin America (CAF). The Swiss, Japanese, and Austrian funding was channelled to the ESCI multi-donor trust fund.

Other partners provided funding, which was not executed by IDB, namely: the International Community Foundation (ICF), FEMSA, Geo-Adaptive, German Society for International

Cooperation (GIZ), Connecting Europe Facility (CEF), the Rockefeller Foundation, Observing Connecting Europe Facility (OSSE), and NADBANK.

Funding for some cities was also provided by local development partners (e.g. national governments, municipalities and companies). The private sector (e.g. Microsoft, Cisco, Telefónica) and academia provided in-kind contributions, such as pro bono work or technical expertise.

Background to the NDF investment

NDF's support to the programme focused on three cities (Cochabamba, Nicaragua and Tegucigalpa) in NDF's three focal countries in Latin America, Bolivia, Nicaragua and Honduras, which are among the poorest countries in the region. NDF had prior to the project provided EUR 45.2 million in credits, EUR 38.7 million in SDR (special drawing rights) and EUR 14.2 million in grants to the three countries.

Like the other regional development banks, IDB is a key partner for NDF. NDF consult with their existing partners, including IDB, on a regular basis and are made aware of new opportunities as they are being developed. IDB was interested in the grant finance and also the climate expertise that NDF could bring, and proposed in 2011 to NDF to support the Emerging and Sustainable Cities Initiative (ECSI). The programme was designed by IDB.

Complementary information on context and needs

This section describes the context for the investment and need that it is responding to.

Urbanisation

Urbanisation has been more profound in Latin America and the Caribbean than in other developing regions and 80% of the population lived in cities in 2014, compared to 50% in 1950. By 2050, 86% of the population is projected to be urban.[18]

The population and economic growth rates in medium-sized cities have increased over the last two decades. On the one hand, the cities are economic centres; in 2010, the contribution of cities to Latin America and the Caribbean's gross domestic product (GDP) was approximately 70% (NDF board consideration). On the other hand, the rapid urbanisation is a major challenge for ensuring that services and infrastructure can meet the needs of a growing population, a challenge further exacerbated by fiscal constraints. Moreover, urban growth is often associated with increased environmental problems, such as air and water pollution from factories, vehicles and poorly managed waste. In the case of Managua, unplanned urban growth has created challenges such as settlements in locations that are vulnerable (e.g. to flooding) or which had a groundwater recharge function.[19] There is thus a need for integrated urban planning that considers the different dimensions of sustainability (environmental, economic, and social).

Vulnerability to disasters and climate change

Honduras is one of the most vulnerable countries to the impacts of climate change and its projected increased frequency and magnitude of extreme weather events. It is already significantly affected by hurricanes, floods and droughts, which pose a risk to lives, houses, economic assets and infrastructure, and ranks as the second most vulnerable country on the long-term climate risk index for 1998-2017 (measured as the countries being most affected by extreme weather events),

[18] Source: www.iadb.org

[19] Source: IDB: Thematic evaluation, Evaluation of the IDB's Emerging and Sustainable Cities Initiative, incl. Managua case study (2016)

with 66 extreme weather events during the period causing an average loss of 1.8% of the GDP annually.

Neighbouring Nicaragua is facing similar challenges and ranks as the sixth most vulnerable country on the long-term climate risk index for 1998-2017, with 45 extreme weather events during the period causing an average loss of 1.0% of the GDP annually.

Bolivia ranks as the 31st most vulnerable country on the long-term climate risk index for 1998-2017, with weather events during the period causing an average loss of 0.38% of the GDP annually.[20]

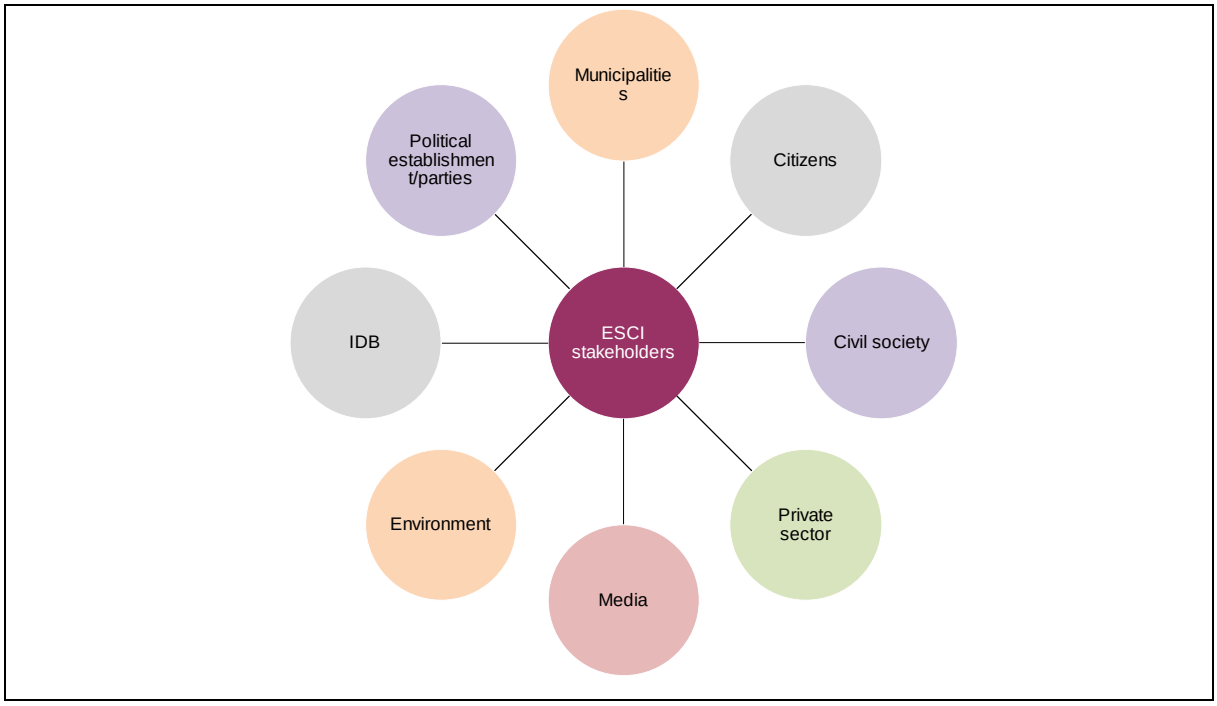
In the urban context, climate risks include issues such as floods and landslides, which can threaten lives and damage houses and infrastructure, increased spreading of vector-borne diseases, and shortages of water and electricity due to drought. Unplanned growth and inappropriate investments in housing and infrastructure (e.g. in vulnerable sites) can further exacerbate these risks, unless the impacts of climate change are taken adequately into account in urban planning and investments.

At the same time, urban centres are responsible for significant greenhouse gas emissions from the use of fossil fuels (e.g. for transportation and industry), waste (e.g. methane released from landfills), industrial production, construction (e.g. use of cement), from the conversion of land previously covered by vegetation (releasing carbon and reducing carbon sequestration).

Stakeholder mapping and NDF's role in the project

Stakeholder mapping

In this section, we map the project stakeholders and for each group identify the key outcomes that are expected see Figure 4. *Figure 4 Stakeholder Map*



[20] Source: https://www.germanwatch.org/en/16046

As the executing partner for the project managing most of the donor funding (incl. NDF funding), IDB was responsible for the procurement of consultants assisting with the implementation of ESCI. IDB also provided grant funding for ESCI from its own sources.

Municipal authorities were the primary direct beneficiary of the project. The components of ESCI gave them: a) an overview and understanding of climate impacts and vulnerabilities, b) methodologies and data to prioritise and select actions and investments for urban development including adaptation and mitigation measures, and c) implementable action plans and investment projects. ESCI also provided municipalities with opportunities to learn from each other's experiences as well as from the experience of cities in developed countries.

Citizens are the end-beneficiaries who indirectly benefit from ESCI to the extent the action plans and identified priority investments, which will improve their lives and enhance the resilience, are implemented. Citizens and **civil society** were involved in public hearings, consultation processes and opinion surveys implemented under ESCI for the plan development and identification of priority investments, as well as in the citizen monitoring systems rolled out. Gender was mainly addressed through a) the consultations with civil society organisations, some of which had a gender focus, and b) women participating in public hearings. However, in the case of Managua, while the plan was participatory in terms of involving different parts of the municipality and relevant government ministries, there were no consultation with civil society and the private sector, nor was the citizen monitoring component implemented.[21] Nonetheless, citizen's priorities were mapped through a survey.

The **private sector** is also an end-beneficiary who indirectly benefits from ESCI to the extent the action plans and priority investments, e.g. in infrastructure (such as public transport, waste management, energy), are conducive for business development, productivity and market access. They also have a key role in the implementation of the plans and investments as contractors and potentially as financiers, and as a key partner in actions related to issues such as air and water quality and workers' health. The private sector was involved in hearings and consultation processes under ESCI, except in Managua. Moreover, no private sector financing has so far been mobilised in Managua.

Political parties are important stakeholders, as they play a key role in the municipal decision-making and ensuring the plans and identified investments are implemented.

The **media** played a role in the communication and awareness-raising vis-à-vis the action plans, and dialogue with the media was important to ensure that the purpose and benefits of the plans were correctly communicated to the public.

The **environment** will indirectly benefit from ESCI to the extent the action plans and identified priority investments which a) promote environmental sustainability, b) reduce environmental degradation, pollution and carbon emissions, and/or c) improve the environmental status.

NDF's role in the project

NDF provided a grant of EUR 2.1 million in 2012-2016 out of the total budget of EUR 2.6 million for the three cities supported; the remaining EUR 0.5 million were provided by IDB as grants. NDF's grant was provided to IDB, who was responsible for the implementation and procurement for ESCI in the three NDF-supported cities. NDF did thus not play an active role in the implementation, procurement or oversight. Nonetheless, NDF followed ESCI through dialogue with IDB and participation in some ESCI events.

[21] Source: IDB: Thematic evaluation, Evaluation of the IDB's Emerging and Sustainable Cities Initiative, incl. Managua case study (2016)

NDF is currently financing a second phase of ESCI (project C68) with EUR 4 million, focusing on the same three cities. This project covers a) pre-investment studies for the integrated mass transit system for Cochabamba, b) an urban development tool kit, a surface runoff master plan and a revitalisation plan for the historic centre for Managua, and c) pre-investment studies for reducing climate change vulnerability in Tegucigalpa.[22]

Outcome analysis

In this section we map the main outcomes for each stakeholder and describe each outcome and how it is expected to be achieved.

Table 14 Outcome map

Stakeholder	Short-term	Medium/long-term	Description
Municipalities	Increased knowledge on vulnerability and climate risks (vulnerability studies) Increased capacity to prioritise investments (e.g. risk assessments) Increased capacity to design mitigation actions (GHG emission reductions plans) Improved selection and design of investment projects with social and environmental benefits Mobilisation of financing facilitated (with action plans and project plans)	• Improved disaster management and risk reduction/prevention capacities and systems • Financing mobilised and projects with social and environmental benefits implemented • (See below outcomes related to end beneficiaries: citizens, private sector and "environment")	
Private sector	Consulted and views/perspectives heard and informing the planning and prioritisation of investments	• New urban infrastructure conducive for business • New business opportunities • Enhanced climate resilience	E.g. improved access to energy, improved access to services such as better public transport
Citizens and civil society	Consulted and views/perspectives heard and informing the planning and prioritisation of investments Increased participation in monitoring of investments	• New urban infrastructure with social and environmental benefits • Enhanced climate resilience • Improved quality of urban life	E.g. Protection from floods, Better access to services such as public transport, better waste management, improved access to water and power
Environment	n/a	Reduced pollution (air and water) Reduced erosion from clearing of vegetation on slopes (urban sprawl) Reduced emissions of greenhouse gases and/or reduced growth in emissions	E.g. better waste management E.g. land zoning and control of land use, upper catchment reforestation E.g. better public transport, better waste management, energy efficiency (electricity consumption)

[22] Source: www.ndf.fi ; IDB: Thematic evaluation, Evaluation of the IDB's Emerging and Sustainable Cities Initiative, incl. Managua case study (2016)

Details on main outcomes achieved

ESCI focused on the development of urban development plans/action plans, investment projects and citizen monitoring, but did not itself engage in the financing and implementation of the action plans and identified investment projects (NDF board consideration, NDF closing report). Hence, the **direct outcomes** of ESCI were planning and capacity related: a) improved capacities of municipalities to engage in integrated planning balancing social, environmental and economic interests while enhancing climate resilience and reducing vulnerability to disasters; b) action plans developed; c) priority investment project designs developed; and d) citizen monitoring systems (except in Managua) put in place.[23] These intended direct outcomes were generally achieved[24], but there were some concerns about quality and sufficiency vis-à-vis climate change action.[25] For example, the climate change data used for the projections were at least in some cases (Managua and Cochabamba) not the most recent and with insufficient spatial resolution, which in turn negatively affected the precision of the climate forecasts and hence the extent to which the plans can provide evidence-based strategic guidance, and potentially the appropriateness of the identified climate actions. Nonetheless, the Municipality of Managua finds the data and projections very useful; moreover, the data has later been updated.[26]

The Managua municipality reports that the action plan has enabled better planning and prioritisation of infrastructure projects. In the action plan priorities for the three cities (especially Managua and Tegucigalpa) there was mainly a focus on adaptation (flood protection) rather than mitigation, although greenhouse gas inventories were established.[27] Managua already had a development plan and vision with identified their priorities, but ESCI helped making it operational and identifying investment projects and actions for the transition towards sustainable development; and the action plan serves as a tool coordination, e.g. of the actions of other donors.[28] In Managua and Tegucigalpa, flood management and disaster management were among the key priorities, whereas in Cochabamba, a key priority was mobility and public mass transport.[29]

The anticipated **longer-term outcomes and impacts** for the citizens, the private sector and the environment included: enhanced resilience and reduced risk of climate-related disasters, improved quality of urban life achieved through investments (e.g. in urban infrastructure and improved environment), a more conducive business environment (e.g. through improved urban infrastructure), improved environment (e.g. less air and water pollution, less erosion), and reduced or less growth in greenhouse gas emissions.[30] However, the data availability to is insufficient to determine the actual achievement of the indirect outcomes and impacts, let alone to contribution of the project. The tangible longer-term outcomes and impacts would be indirect and depending on the extent to which financing is mobilised and the implementation and investment projects identified in the plans are implemented. Significant funding was mobilised for implementation, but seemingly mainly from international donors, especially those funding ESCI. By 2015, IDB had allocated USD 1.7 billion in credits for investment projects for the priority investment projects

[23] Source: IDB: Thematic evaluation, Evaluation of the IDB's Emerging and Sustainable Cities Initiative, incl. Managua case study (2016); NDF closing report; Ezquiaga: ICES, Evaluación y Lecciones Aprendidas, en 20 Ciudades de América Latina y el Caribe (2010-2015); interviews; action plans

[24] Source: NDF closing report, action plans

[25] Source: interview

[26] Source: interview

[27] Source: action plans, interview

[28] Source: IDB: Thematic evaluation, Evaluation of the IDB's Emerging and Sustainable Cities Initiative, incl. Managua case study (2016); interview

[29] Source: IDB: Thematic evaluation, Evaluation of the IDB's Emerging and Sustainable Cities Initiative, incl. Managua case study (2016); interviews; action plans

[30] Source: NDF board consideration

identified by ESCI across Latin America.[31] . It can thus be assumed that some or many, but not all, of the intended outcomes and impacts would have been achieved, albeit with significant differences between the participating cities. In the case of Managua, some of the infrastructure projects (e.g. for flood protection) identified had been implemented with donor funding (e.g. from IDB and the World Bank), but the private sector has not engaged in financing of such projects and finance mobilisation is a major challenge as many donors have pulled out of Nicaragua – hence it is unlikely that the plan and will be fully implemented and the intended long-term outcomes and impacts achieved.[32]

Details on NDF's contribution to outcomes (incl. NDF's leverage)

NDF did not play a role in the design of ESCI; the design was carried out by IDB.

NDF was the main donor for the implementation of ECSI in three out of 71 cities: Cochabamba (Bolivia), Managua (Nicaragua) and Tegucigalpa (Honduras).

NDF's funding was executed/managed by IDB and all procurement followed IDB rules and procedures, which limited the need for direct supervision by NDF. With the responsibility for procurement handed over to IDB, NDF had little influence on the procurement process and selection of consultants, and thus limited influence on the methodologies promoted and the quality of the plans. Moreover, NDF had little direct interaction with the municipalities, and hence the visibility of NDF was low.[33]

Nonetheless, while NDF did not have a significant direct role in programme management and oversight, the NDF programme office did engage in ESCI in terms of participating in ESCI events and following its progress, including maintaining a dialogue with the IDB programme manager and meeting they municipalities during in-country missions.

Regarding leverage, NDF was the first donor to join ECSI, and thereby NDF provided inspiration for other donors to join, which allowed for a significantly larger number of cities/countries to be covered.[34]

Interviewees were of the opinion that without NDF funding, ESCI would probably not have reached the three cities covered by NDF. Hence, while the cities would probably still have developed action plans and investment projects, they would most likely not have been of the same quality, as they would not have had the same access to data or citizen's perspectives. While mobilisation of financing for the implementation of the plans remains a challenge for the cities, the plans and some of the project designs development have guided IDB and World Bank investments in the cities; hence, the NDF made a contribution to ensuring the quality and relevance of the investments made.

Overall, NDF's contribution to direct project outcomes is assessed as quite high for the three cities supported by NDF, as NDF provided most, but not all, of the funding for ESCI in these cities. For the overall ESCI programme, NDF's contribution was quite low given that NDF's funding only covered 3 out of 71 cities.

[31] Source: NDF closing report

[32] Source: interview

[33] Source: interview

[34] Source: interviews

Findings on additionality/complementarity

The scope for additionality and complementarity was limited by the fact that IDB managed the fund and designed ESCI, so the direct involvement of NDF was limited. NDF had limited influence on the implementation, approaches and procurement under ESCI. Similarly, with the low level of visibility and engagement with the municipalities, the scope for influencing the cities was limited. The total budget of ESCI was USD 69.3 million, of which NDF provided EUR 2.1 million (approximately USD 2.4 million), corresponding to less than 5% of the total budget.

Hence, with a large amount of funding from several other donors and the NDF funding managed by IDB with limited influence from NDF, the main additionality of NDF was that its support enabled the coverage of three additional cities under ESCI. Interviewees were of the opinion that without NDF funding, ESCI would probably not have reached these three cities.

NDF engaged a consultant to work with IDB and provide technical support and advice vis-a-vis the integration of climate change in urban planning and investment; this consultant was not directly involved in ESCI (C40) but in ECSI II (C68), although there was some overlap between the two phases.

Overall, the choice to channel funds through IDB enabled NDF to use of IDB capacities and in-country presence vis-à-vis procurement and supervision – capacities, which NDF does not possess due to its small size and lack of an in-country presence.

The fact that NDF overall was only a minor financial contributor to ESCI also appears to have limited the scope for influence; a more significant influence would probably have been feasible if NDF had been a donor to a smaller programme as was the case for SDC in PAGRICC (C17). Similarly, direct granting to the national partners would also have better enabled NDF to influence the project in the three cities supported, but would then have come with challenges related to project oversight due to the lack of in-country presence as was the case for PAGRICC (see the case study on PAGRICC).

Findings on other issues

Alignment with mandate

As described in section ”Details on main outcomes achieved”, the action plans and investment projects developed under ESCI addressed **climate change adaptation/resilience**, while promoting improved livelihoods and urban well-being, e.g. through improved urban infrastructure and land use zoning. The project embraced an integrated approach, which addressed both environmental, social and fiscal concerns.

It also promoted **innovation**, in terms of promoting the integration of climate change considerations in urban planning and investments/infrastructure development.

The project did not engage in **high risk**. Private sector development was indirectly addressed through consultations to get the perspective of the private sector vis-à-vis action plans and priority investments.

Gender issues were covered to some extent but were in general not a major part of ESCI.

Alignment to partner priorities

Historically, there has been a significant Nordic engagement in the three countries covered by NDF; for example, Bolivia and Nicaragua were previously Danida programme countries, and Norad funded agro-ecological and hydrological studies for Managua (Nicaragua). The focus on

climate change adaptation, mitigation, and the development of environment-friendly urban solutions (e.g. the promotion of cycling) is also well aligned with the priorities of Nordic countries.

Gender issues were covered to some extent through consultations, but was in general not a major part of ESCI. The action plan for Cochabamba has a section on gender, whereas gender is only briefly mentioned in the Tegucigalpa action plan and not mentioned at all in the Managua plan (actions plans).

ESCI was also aligned with IDB's focus on social inclusion and equality, productivity and innovation, climate change and environmental sustainability, and institutional capacity.

Moreover, the project was aligned with the participating municipalities' mandates vis-à-vis sustainable urban development and ensuring the well-being of their citizens.

Experience with private sector

ECSI was implemented by IDB and municipalities and funded by international development assistance, and not with private sector partners. However, the private sector was consulted in the planning process (except in Managua). The plans also provide a foundation for mobilising private sector financing for investment projects (although private sector financing has not been mobilised Managua). The investment projects would potentially benefit the private sector.

Private companies would also be contracted for the construction of infrastructure and delivery of agricultural inputs. Consultants were engaged to carry out capacity development, studies/assessments and other assignments for ESCI.

Catalytic effect

The ability to react swiftly and being flexible is an added value of NDF, as evidenced by NDF being the first donor to join IDB's ESCI initiative, thereby also serving as an inspiration for other donors and thus contributing to enabling ESCI to become a large initiative (see section "Details on NDF's contribution to outcomes (incl. NDF's leverage)").

As mentioned above, significant volumes of financing were leveraged for the implementation of investment projects identified and developed under ESCI. However, this catalytic effect was to a large extent driven by IDB, with a significant amount of the funding leveraged in the form of IDB credits (USD 1.7 billion). In Managua, funding was also mobilised from the World Bank.

IDB has under ESCI II continued with supporting the development of urban plans for more cities, including large cities. Moreover, in 2016, IDB established an urban development department, this decision was influenced by the experience with ESCI.[35]

Learning from the experience from ESCI, the African Development Bank is now setting up a fund for sustainable urban development.[36]

Nordic 'value added'

NDF has also introduced ESCI as well as ESCI II to Nordic experiences and expertise, e.g. by introducing ESCI to the Danish company Gehl Architects, which presented innovative approaches

[35] Source: interview

[36] Source: interview

to developing urban spaces to representatives from cities participating in ESCI. Gehl Architects was engaged in ESCI cities supported by other donors.

In May 2019, the mayors of the three cities supported by NDF visited Copenhagen and Malmø to learn from Nordic experiences, e.g. with environment-friendly mobility and considering the mobility of pedestrians and bicycles rather than focusing only on vehicles.

Moreover, NDF is funding a Danish technical adviser at IDB, who provides recommendations and advise on Nordic solutions under ESCI II (C68), but the actual influence and impact of this on the implementation of ESCI II appear modest.

Assessment of data quality and gaps

Data gaps/quality related to outcomes (incl. contribution to outcomes)

There is some information available about the main outcome of ESCI in the three cities, as the three action plans, the main outcomes in each city, are available. In terms of progress, activity, output and outcome reporting, only a brief NDF closing report was made available. Two evaluations are available at the overall ESCI level.

But, with the exception of a brief case study on Managua in the thematic evaluation (2016), there is only little information on NDF's role (which is unsurprising given NDF did not play a direct role in the implementation and oversight) or the three cities supported by NDF. Overall, there is considerably more information available for Managua than for the other two cities, from the case study and from an interview with the municipality. Information on the longer-term, indirect, outcomes and impacts is limited.

Table 15 Evidence matrix

Stakeholder	Short-term outcome	Data availability
Municipalities	Increased knowledge on vulnerability and climate risks (vulnerability studies) Increased capacity to prioritise investments (e.g. risk assessments) Increased capacity to design mitigation actions (GHG emission reductions plans) Improved selection and design of investment projects with social and environmental benefits Mobilisation of financing facilitated (with action plans and project plans)	The action plans, some documents/assessments prepared are available. Some information is available in the evaluation reports, but with limited information on the three cities supported by NDF.
Citizens and civil society	Consulted in the planning and prioritisation of investments	Consultation outcomes present in action plans. Some information is available in the evaluations.
	Increased participation in monitoring of planning and investments	Some generalised information on the citizen monitoring is available in the evaluations.
Private sector	Consulted in the planning and prioritisation of investments	Limited information is available in the evaluations.
Environment	Plans for more environmentally sustainable urban development	The action plans, some documents/assessments prepared are available. Some information is available in the evaluation reports, but with limited information on the three cities supported by NDF.
	Plans for greenhouse gas emission reductions	The action plans contain emission assessments, but the plans focus more on adaptation than mitigation.

Data gaps/quality related to other issues

The 2010-2015 evaluation and lessons learned covers 20 of the 71 cities supported by ESCI, including two of the three cities funded by NDF (Cochabamba and Managua), but it does not cover Tegucigalpa. It provides generalised findings and provides little information on NDF's engagement or the NDF supported cities.

Similarly, the 2016 thematic evaluation covers the entire ESCI programme with only brief references to NDF and the NDF supported cities, and but it also contains a brief case study on Managua.

Lessons Learned

From interviews:

There is limited scope for NDF to influence approach, implementation and procurement, when funds are provided as a co-financing grant to be managed by a large multilateral investment bank – in particular, when NDF is only a small donor out of several donors to a very large programme. This limits the additionality, complementarity and added value to mainly being the contribution of additional funds, which allows a larger programme. Nonetheless, NDF appears able to have some informal/soft influence and some degree of visibility, when it engages in active dialogue with the investment bank and participates in some activities.

With the absence of an in-country presence, the visibility of NDF is low, when the funds are managed by partner on behalf of NDF; the national partners may know that NDF is the donor, but not what NDF's priorities are or how NDF could add value.

Annexes

Annex 1: List of documents consulted

The documents reviewed are:

- NDF website
- IDB website
- Board consideration (2011)
- NDF closing report (2017)
- Ezquiaga: ICES, Evaluación y Lecciones Aprendidas, en 20 Ciudades de América Latina y el Caribe (Evaluation and lessons learned) (2010-2015)
- IDB: Thematic evaluation: Evaluation of the IDB's Emerging and Sustainable Cities Initiative, incl. Managua case study (2016)
- Action plans for Cochabamba (Dec 2013), Managua (Dec 2013), Tegucigalpa (Nov 2015)

Annex 2: List of persons interviewed

The interviews include:

- Aage Jørgensen, NDF programme manager
- Ellis Juan, former IDB programme manager (retired)
- Maritza Maradiaga, Managua municipality
- Sune Holt, climate change consultant supporting urban planning programmes at IDB – funded by NDF

Case Study C88 – African Guarantee Fund

List of Acronyms

Acronym	Meaning
AECID	Spanish Agency for International Cooperation and Development
AfDB	African Development Bank
AFD	Agence Française de Développement
AGF	African Guarantee Fund
APP	African Progress Panel
CGS	Credit Guarantee Schemes
EPA	United States Environmental Protection Agency
GGF	Green Guarantee Facility
GHG	Greenhouse Gas
GVA	Gross Value Added
ICT	Information and Communications Technology
IFC	International Finance Corporation
IFU	Investment Fund for Developing Countries
ILO	International Labour Organization
NCF	Nordic Climate Facility
NDF	Nordic Development Fund
OECD	Organisation for Economic Co-operation and Development
PCGs	Partial Credit Guarantees
PFIs	Banks and Financial Institutions
PSD	Private Sector Development
PUE	Productive Use of Electricity
SCC	Social Cost of Carbon
SME	Small and medium-sized enterprises
SROI	Social Return on Investment
SSA	Sub-Saharan Africa

Background and context

Key data

Name: African Guarantee Fund Green Guarantee Facility Ref: NDF C88

Country: Pan-African

Approved NDF grant: EUR7.6 million, disbursed: EUR7.6 million

Board approved: 16th March 2016

Project implementation: 2016-2018

Implementing agency: African Guarantee Fund

Background to the project

Background to the NDF investment

This case study focuses on the Green Guarantee Facility (GGF) funded by NDF as part of the African Guarantee Fund (AGF). Historically, NDF has had an informal connection with the AFG through its work with the AfDB, and through networking events. NDF consults with its partners on a regular basis and is made aware of new opportunities as they are being developed. The AFG were interested in the climate expertise and finance that NDF could bring and, at the time, NDF was seeking new types of partnerships/financing mechanisms. The opportunity to take an equity stake in AGF came therefore at the right time for NDF.

NDF made a first investment in 2016 of EUR 7.6 million. This was a mix of equity (EUR 6 million) and grant (EUR 1.6 million) and enabled AGF to open up a green guarantee window. The Green Guarantee Facility (GGF) provided guarantees to African financial institutions investing in business models that were considered part of the green economy. A second round of funding was agreed last year and finalised in June of 2018 amounting to a capital injection of EUR 9 million, bringing NDFs' total equity exposure to AGF to EUR 15 million. This was accompanied by a grant worth 1.25 million. The aim of the second round was to scale up the GGF to countries outside of the initial pilot.

NDF joined Denmark and Spain as Class C shareholders carrying first loss risk and obtained a full voting seat on the AGF Board. The investment has a 7-year lock-in period with the option for phased exit thereafter. The AGF is now 8 years old and there has been no indication from other investors that they want to exit. The investors are all development focused and are happy with the outcomes thus far.

About the African Guarantee Fund

AGF is a non-bank, financial institution established to promote access to finance for SMEs through partial guarantees of commercial banks' loans to SMEs. It is a company limited by shares incorporated and was officially launched in 2011 with share capital of USD 50 million. It was founded by the government of Denmark through the Danish International Development Agency (DANIDA), the government of Spain through the Spanish Agency for International Cooperation and Development (AECID) and the African Development Bank (AfDB). Agence Française de Développement (AFD) joined AGF in 2015 followed by the Nordic Development Fund (NDF) in 2016. Investment Fund for Developing Countries (IFU) and KfW Development Bank joined AGF in 2018.

According to the latest AGF financial management report, AGF has cumulatively, issued USD 920.4 million worth of guarantees. This has catalysed beneficiary PFIs to make available about USD 1.9 billion for SME-lending. Out of this financing made available to-date, USD1.4 billion has been disbursed as facilities to SMEs, which translates to about 77% of the total facility disbursed since inception (AGF, 2019). It has also established a widely recognized brand and blended finance business model. In 2017 it obtained a AA- Fitch rating. In 2019 it plans to work in 45 countries in Africa. It will cumulatively have unlocked financing for 7,500 SMEs across Africa of which more than 90% are owned by women and/or youth. Total underlying job creation is estimated to be 87,000 to date.

The Green Guarantee Facility

In its original board documentation, the GGF was designed to target SME investments in: sustainable energy, cleaner production, climate smart agriculture, natural resource management and green services aimed at the sustainability of African economies, with a view to achieving growth in

green jobs, income and quality of life for low income communities. It was piloted in four countries: Kenya, Cote d'Ivoire, Ghana and Zambia, with flexibility to work in other countries pending demand and in alignment with normal AGF business procedures

The GGF uses an activity-based classification list to help AGF and partner banks decide whether a prospective borrower is eligible for a green guarantee. There are four broad categories, each with a list of eligible investments. A borrower must be able to "check" at least one of these to be eligible.

The grant component of NDF's financing provides technical assistance to strengthen SME capacity. This has three objectives:

1) Strengthen green SME financing capacity at partner financing capacity at partner banks and AGF;

2) Support roll-out and absorption of the green guarantee product in target markets; and

3) Support monitoring of green guarantee results and impact.

NDF grants also funded the roll out a series of high-level Green Finance Conferences and trainings in Zambia, Kenya and Ghana, with a 4th planned for Cote d'Ivoire in June 2018.

To date, the GGF has mainly supported company expansion in renewable energy, primarily solar home systems. These businesses provide off-grid electricity to households, providing them with lighting at night-time and associated benefits, and tend to displace kerosene torches which produce carbon emissions as well as indoor air pollution. Reportedly, there has also been one agriculture investment, although we have not been provided with any information on this. While the scope of the facility is wider than renewable energy, therefore, these dominate investments to date, as well as the pipeline of future investment.

Complementary information on context and needs

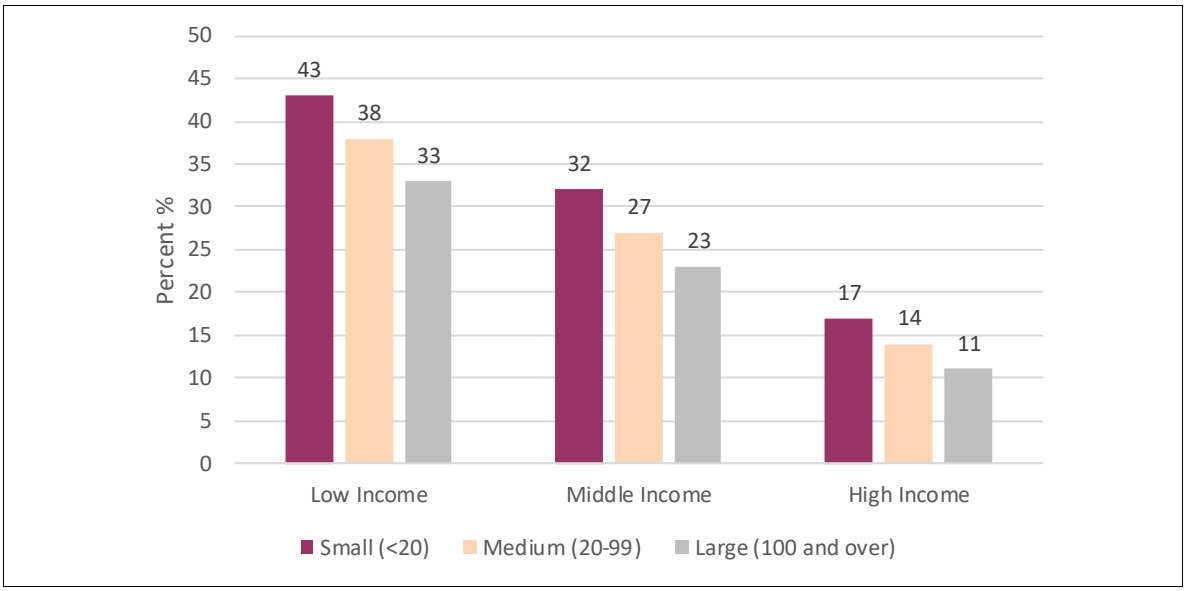
This section describes the context for the investment and needs that it is responding to.

Social value of SMEs

Most businesses in the world are SMEs and they hire more people than any other firm type (Beck, et al. 2005) . All businesses also start out as SMEs, and studies have shown that they are drivers of economic growth in developing countries (Ayyagari,et al.2003) While the size of the SME sector does not seem to have a causal impact on growth per se, an economy depends on a flow of new and innovative enterprises, a majority of which tend to be small (Klapper, et al. 2006). Moreover, about a third of SMEs globally are women-led (Women's World Banking, 2019). Research finds positive development and equality outcomes from female entrepreneurship, including greater investment in employee growth and well-being by women managers (Shiff et al., 2013).

SMEs are therefore seen as central to efforts to achieve environmental sustainability and more inclusive growth (OECD, 2017). They face significant obstacles to development, however, the most cited of which is access to finance. This is particularly acute in lower income countries (see Figure 5), where 80% of enterprises are informal. In Africa over 85% of employment is informal (ILO, 2018). Informality is thus also a barrier: it hampers productivity growth, leads to poorer working conditions, reduces the size of the tax base and weakness the social contract (ibid.).

Figure 5 Percentage of firms viewing access to finance as a major obstacle for by firm size and country income group



Source: World Bank Enterprise Surveys 2006-2009

SMEs access to finance

As Figure 15 shows, there is clear relationship between firm size and the perception that access to finance impedes growth, and this is more pronounced for lower income countries. The World Bank estimates that the percentage of SMEs unserved or underserved by the formal financial sector is between 26–32% in developing countries (Stein et al. 2013). In Africa, only 29% of formal SMEs have access to a loan (Triki and Faye, 2013) and the figure is probably close to zero for informal businesses. There is a global SME credit gap of around USD 1 trillion, rising to over USD 2 trillion if informal SMEs and micro-enterprises are taken into account. The effect of these constraints has also been found to be stronger for SMEs than for large firms (; Beck et al.,2006;). About 70% of women-led enterprises are thought to be underserved financially (Women's World Banking, 2019), meaning that these firms receive a disproportionately small percentage of the already limited financing available for SMEs.

SMEs are regarded by creditors and investors as high-risk borrowers due to:

- insufficient assets and low capitalisation;
- vulnerability to market fluctuations; and
- high mortality rates.

There are also information asymmetries arising from:

- SMEs' lack of accounting records;
- adequate financial statements or business plans makes it difficult to assess creditworthiness
- (relatively) high administrative/transaction costs of lending or investing small amounts.

With women-led enterprises, while most financial institutions do not intentionally discriminate based on gender, the "gender-neutral" supply of services and marketing mechanisms used tend to cater more for men than women (Shiff et al., 2015).

Low carbon development has long been identified as providing opportunities for African countries to improve access to modern energy services while also building low-emission and climate-resilient economies (Gujba, et al. 2012). However, access to finance is again a major barrier. Verdolini (2018) explains that as most green technologies have relatively high ratio of up-front to operating costs, their viability is particularly sensitive to SMEs. In addition, the returns to green-technology SMEs may accrue over a long-term horizon, making the financing constraints even

more severe (ibid.). SMEs also face a lack of affordable and reliable energy. The African Progress Panel (APP) describe a potential 'triple win' as renewable technologies create opportunities to increase agricultural productivity, improve resilience to climate change, and contribute to long-term reductions in carbon emissions (2015).

Finally, recent analysis estimates that USD 52 billion needed annually to meet the 2030 objective of universal electrification (SDG7) (SEforALL, 2015). The study also found that only one percent of total trackable finance (USD 200 million per year) for electricity committed in 2013–14 across high-impact countries (i.e. those in greatest need) were for off-grid energy solutions despite their potential for reaching the rural poor.

Credit guarantee schemes (CGS)

There is widespread agreement in the literature for the need to address the funding gap for SMEs in developing countries. Interventions tend to provide different combinations of finance and risk mitigation tools and may be priced at or below market rates. The goal is to lower costs and boost risk-adjusted returns for lending to SMEs. One such tool is CGS (or partial credit guarantees (PCGs)), which are used by countries at all levels of development: almost all OECD countries have them, as well as many developing countries, and they are supported by multilateral and bilateral donors (Green, 2003). By reducing the riskiness of SME loans, guarantee schemes should make them more attractive to lenders, increasing the flow of credit. The evidence for CGS is mixed, not least due to the challenge of additionality and the heterogeneity of the schemes (Samujh et al. 2012). However, there is broad consensus that they are an important form of intervention to tackle financial exclusion (Saandani et al. 2011).

The IFC recommends a series of guiding principles to improve effectiveness such as clear eligibility criteria, limited coverage ratios, scalable credit approval mechanism, fees, payment rules, use of collateral/down-payment, and equity ratios, among other parameters (ibid). It was not possible to assess the GGF alignment with these principles as no access to beneficiaries was provided to the research team.

Stakeholder mapping and NDF's role in the project

In this section, we map the project stakeholders and identify the key impacts that expected for each group.

Stakeholder mapping

Figure 6 Stakeholder map

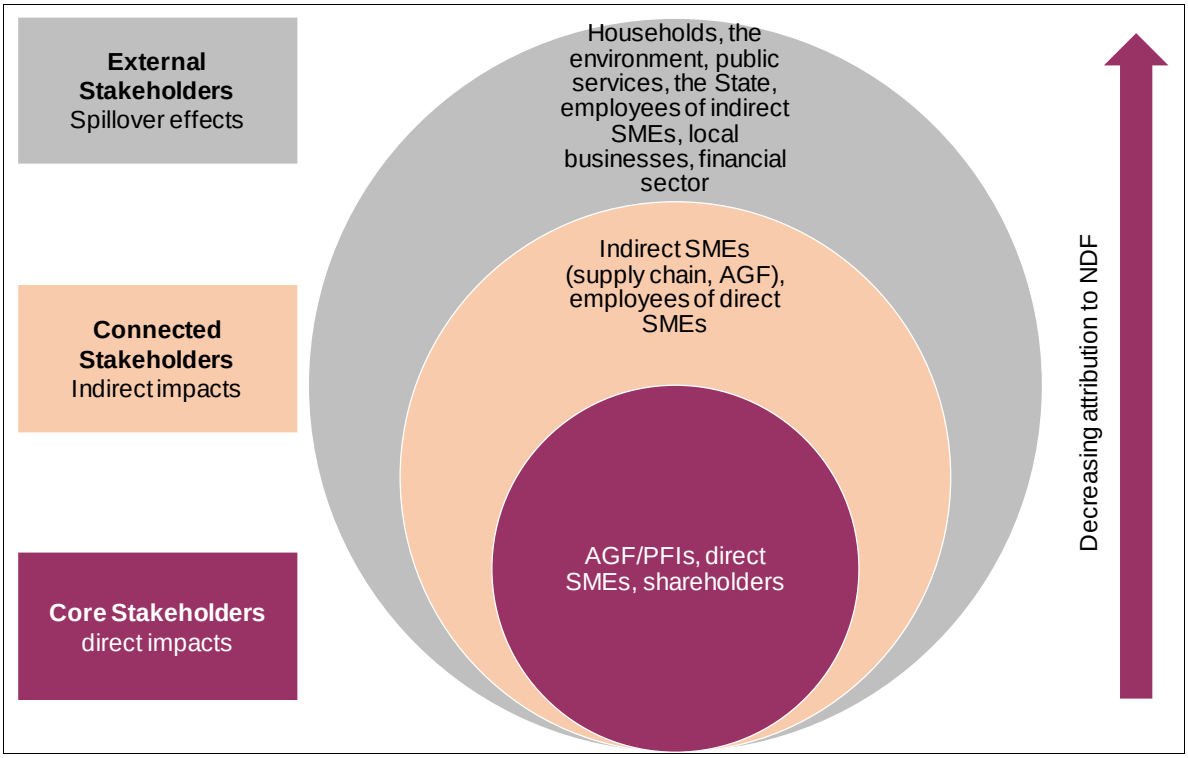


Figure 16 sets out the stakeholder map. **Core stakeholders** and direct beneficiaries are PFIs and SME owners. When assessing value-creation for SMEs, we recommend segmenting women-owned enterprises due to the higher potential for benefit and greater additionality resulting from more severe financing constraints. **Connected stakeholders** and main indirect beneficiaries are SMEs that benefit via supply chains or through the greening of AGF, as well as employees of direct SMEs. **External stakeholders** that benefit through spill over effects are households (via electricity consumption), the environment (GHG emissions), business and public services (electricity consumption), employees of indirect beneficiaries, the State (via taxes) and the wider financial sector. The additionality of NDF financing decreases as we move from core to external stakeholders as attribution to other actors increases.

Project outputs and NDF's role in the project

Project outputs

The project has gathered data on several outputs. The AGF has signed USD 21.3 million in green guarantees, with demand estimated at USD 45 million. To date, there have been zero claims and losses for green guarantee transactions, with a cumulative loss rate since inception across the whole portfolio of less than 1% (NDF, 2018).

In addition, the Green Finance Conferences mobilized high level participation in Zambia, Kenya Côte D'Ivoire and Ghana and are thought to have raised the profile of AGF (and NDF);

trainings targeting staff of financial institutions and women entrepreneurs. However, there is no external verification of this.

Projects to date have mostly funded solar projects, although, as discussed, the original intention was that the fund would have a wider remit than that. According to AGF, it is now mandatory in Kenya for new houses to have solar systems installed, and this has driven the demand for these systems. Solar will therefore remain the biggest player in the GGF, although hydro is also growing in importance.

NDF's role in the project

NDF is a Class C shareholder in the AGF (carrying first loss risk). It has a full voting seat on the AGF Board.

NDF are able to contribute to effective management as have the same oversight role as other investors. They have a seat on the Board and meet regularly to review the strategy and business results of the company. They also receive separate reporting on the progress of the green guarantee.

According to NDF, standard due diligence missions took place prior to both rounds of investments. They told us they monitor E&S policies at AGF level for compliance with NDF standards and Board participation ensures regular (at least 3x yearly) monitoring and oversight. There are plans for a fuller evaluation later in 2019 to test the veracity of the figures produced by AGF.

Outcome analysis

In this section we will map the main outcomes for each stakeholder and describe each outcome and how it is expected to be achieved. Details on the sources for the outcome analysis are listed in Annex 1 of this case study. **The analysis faced several large data gaps** and secondary literature was consulted extensively to fill these (see box below and next sub-sections).

Box 1 Overview of key data limitations

The original brief with this case study was to complete a Social Return on Investment Analysis (SROI) for the GGF. However, due to severe limitations with data and access to stakeholders this was not possible. SROI is a participatory methodology that requires extensive stakeholder engagement to support the estimates that underpin the analysis. Although extensive stakeholder engagement was not part of the original research plan, it was hoped that some engagement would take place electronically to enable a simplified analysis based on the principles of SROI. However, in this case example, the researchers were only successful in securing two very short interviews, and interviews with SMEs benefiting from the guarantee were not possible. In addition, the datasets provided were based on unclear estimates and it has not proved possible to obtain information on how these were arrived at. They were also often decontextualized, and in some cases contradictory (e.g. whether they were annualised or risked double counting with other outcomes). Efforts to verify data through interviews with M&E staff at AGF to verify outcomes data were also not successful.

To support the case study completion, therefore, and produce something useful, the research team have relied heavily on secondary literature. There is a growing evidence base on the benefits of renewable energy projects that has been useful. In the final assessment, however, we do not think that the analysis presented here qualifies as an SROI study, as the process followed, and data quality are not consistent with the principles of that framework. Instead, we present the case study as an economic analysis that draws upon the principles of SROI.

Although all outcomes associated with the project are discussed in detail, only a small number had sufficient data quality to inform the economic assessment. Even these require heavy caveating as they are based on a number of assumptions that it has not be possible to verify the robustness of. With this in mind, it is important that the figures supplied here are used to better understand the types of value that projects could create, the data that would be required to accurately estimate this, and the limitations of current data in this respect. The

estimates provided are therefore illustrative, rather than accurate measures of the value of the project. The real value of the exercise, in our view, is to demonstrate the potential of SROI analyses to capture value-added in a holistic and nuanced way, to map would be needed to achieve this, and therefore to inform the design of NDF's M&E systems going forward.

Outcome mapping

Table 16 Outcome map by stakeholder

Type	Stakeholder	Short-term outcome	Medium/long-term
Core	SMEs (direct)	SME growth	Improved incomes/livelihoods
Core	Women-owned SMEs	SME growth	Improved incomes/livelihoods
		Leadership and influence in community	Gender equality outcomes
Connected	SMEs (indirect)	More green finance available via 'greening' of AGF	Greater access to finance
		Increased demand for goods and services for SMEs in supply chain	SME growth
Core	AGF/PFIs	Improved capacity to leverage green finance from other lenders Improved capacity to lend to green SMEs	Greater profitability
Connected External	Employees (direct) Employees (indirect)	New jobs New jobs	Improved incomes/livelihoods
Connected	Employees (female)	As with entrepreneurs	As with entrepreneurs
Core	Shareholders	Return on investment	More finance available for new investments
Core	Shareholders	Children able to study in the evenings	Improved school performance
External	Households	Access to affordable energy	Productive uses of electricity and reduced expenditure on kerosene/mobile charging
External	Households Households (female) SMEs	Fewer health and safety risks from kerosene[37]	Increased longevity and health of households
		Access to affordable energy	Economic empowerment of women
		Access to electricity	Improved productivity
	Environment	CO2 and black carbon[38] emissions avoided	Climate change mitigation
External	Public services	Access to electricity	Better quality health services (e.g. refrigeration of medicine) and schools (e.g. lighting, ICTs)
External	State	Taxes paid by SMEs	More funding available for public services

[37] Kerosene lamps pose significant health impacts, (lung function risks for respiratory disease, cancer, eye problems, and infectious disease, including tuberculosis). Kerosene lamps also pose safety and fire risks. In Nigeria, for instance, thousands of people are maimed each year by lamp explosions, with a 13% fatality rate.

[38] Black carbon particles absorb sunlight and heat the atmosphere, increase radiative forcing and contribute to climate change.

Details on main outcomes achieved

In this section, we provide an overview of the main outcomes that have been achieved. As discussed in Box 3, these are based on very limited data sources. For most of the outcomes set out in Table 28, we have insufficient data (e.g. the data is not disaggregated/thorough enough) to merit a discussion. For example, we have numbers on overall jobs but not by gender and so on. The sections set out here do not therefore read directly across to the outcomes map, but data limitations are highlighted again later in the case study.

Job creation

The source of data on job creation is the AGF Implementation report for the GGF. This estimates that the following jobs have been created:

- Direct jobs: 28,500
- Indirect jobs: 56,500
- Temporary jobs: 1000

The timeframe over which jobs have been created is not clear from the documents reviewed and has been estimated in the analysis below based on project duration. No other information was available on the type/quality of jobs (see also section on data limitations).

Leverage and the greening of AGF

The NDF involvement has been thought to impact on the wider portfolio of AGF. Reportedly, in the early stages of this project, investment bankers that AGF encountered were somewhat sceptical about distinguishing green guarantees. However, this is considered to have changed as a result of NDF's influence. For example, a series of workshops were set up to identify green businesses of the future, and significant demand for the guarantee product emerged.

The facility aimed for a 8:1 leveraging ratio, and this had reached 7:1 by the time of writing. According to NDF, the AGF Business Development team is now recognized for expertise in green finance, and staff demonstrate strong buy-in and pride in the green guarantee product and mission.

Valuing leverage with respect to AGF is challenging. First, we would need to know whether leveraged green finance was new or came from existing AGF funds. For existing AGF finance, we would need to monitor change in the portfolio to see if it was (for example) moving away from fossil fuels, or perhaps from other developmentally beneficial investment. The value generated by the green finance then needs to be set against the value potentially lost from the displaced activity. The issue still arises with new finance, which may have displaced another development activity, particularly if the source was a donor agency. Again, the GGF may be more valuable than the alternative use, but this would need more exploration than was possible in this case study.

Environmental benefits GHGs

Initial baseline projections for greenhouse gas (GHG) reductions from underlying SME activities were 5,500 tons of CO2 equivalent per year. However, according to NDF, based on 2018 estimates, projected reductions stemming from projects financed with green guarantee coverage suggest reductions of more than 10,000 tons CO2 equivalent per year. Annualized projections for indirect emissions reductions attributed to the 2018 round of financing are 15,000 tons of CO_2 equivalent per year (NDF, 2018). While the NDF's figures do not correspond with those in the AGF implementation report, we have based our analysis on the NDF report as they are clearly annualised.

Kerosene lighting also contributes to the emission of 'black carbon' which is also a greenhouse gas, Globally, an estimated 270,000 metric tons of black carbon are emitted annually by kerosene lamps, equivalent to 240 million metric tons of CO2 (Jacobson et al., 2013) Black carbon also has negative public health consequences. (Grahame et al.2014). We have detailed these outcomes in the impact map above but due to lack of data on emissions avoided have not included them in the analysis.

A further environmental benefit of 'reduction in seasonal floods' has also been reported on but no data have been provided for this metric (AGF, 2018).

Gender mainstreaming

According to NDF, it actively uses its seat on the AGF Board to advocate for a strong gender focus in all aspects of operations. The NDF-sponsored Green Finance Conference series has taken a particular focus on providing trainings for female entrepreneurs. AGF partnered with Barclays Bank in Kenya to train 46 women entrepreneurs in green business opportunities during the Nairobi Conference and scaled up the offer to 110 women entrepreneurs in Ghana during the Accra Conference. Gender focused engagement is planned to continue as the Green Finance Conference series expands into new countries. AGF has also been selected by the AfDB (and G7 Group in Biarritz) to serve as host institution for the AFAWA initiative (Affirmative Finance Action for Women in Africa) which will establish a women-focused guarantee window within AGF based on the template NDF pioneered with GGF.[39]

In our outcomes map (Table 1), we identify three ways that women could benefit from the GGF. The first - and the way it has been interpreted by NDF - is an increase in women-led enterprises. At the level of the AGF portfolio, an estimated 30% of SMEs supported through AGF guaranteed bank loans are owned by women. We do not have equivalent data for GGF however. There are also risks for this outcome, however. The renewables sector – like fossil fuels – has not traditionally been a good employer of women, for example (Baruah, 2016). Women might also benefit from access to electricity by either starting or growing their businesses. However, research also finds that women tend to operate in smaller and less energy intensive enterprises in the first place, and hence can draw fewer benefits from Productive Use of Electricity (PUE) interventions than men (Pueyo and Maestre, 2019). The third potential benefit is at the household level. As women are mainly responsible for domestic chores, electric appliances can reduce drudgery, free up time and improve quality of life. The literature has tended to focus on women at the household level. There is strong evidence of the link between energy poverty and a range of factors such as women's health, use of time, education, access to information (Kooijman-van Dijk et al. 2010; Winthers et al. 2017; Barnes et al. 2014). However, neither the second or third potential benefit have been considered in NDF's data monitoring to date.

There are also several sets of guidance available on how to mainstream gender in energy projects, which may be useful (Cecelski and Dutta, 2011; Clancy et al. 2007). Due to the lack of any disaggregated gender data, however, no outcomes for women have been taken forward to the economic assessment.

Access to energy

As detailed above access to energy benefits three different groups:

- Households (with discreet benefits for women and school children)
- Businesses (with discreet benefits for women)

[39] http://www.africanguaranteefund.com/news/179/160/AFDB-AGF-s-AFAWA-INITIATIVE-TO-BOOST-ACCESS-TO-FINANCE-FOR-WOMEN/d,secondpage-EN

- Public services.

No information was provided to us from the projects on benefits to local businesses or public services, apart from estimates of jobs created, which are included as part of the job estimates. Benefits outlined in other papers (summarised by SEFA, 2019) for businesses include:

- Savings on lighting
- Reduced time spent on production
- Increased productivity and profits.

For public services, the benefits are:

- School facilities with access to electricity
- Change in costs of health service providers
- Change in maternal mortality
- Change in mortality
- Use of digital technologies by government services.

SMEs that are more productive tend to pay more tax, which benefits society and public services. NDF did not provide details on taxes paid, so we have made an assumption based on the average of Kenya and Ghana corporation tax rate (27.5%), which we have levied on the Gross Value Added (GVA) for the energy sector in Kenya (KBNS, 2019).

Of the three projects funded under the pilot, two provide off-grid (PEG-Ghana Ltd. and SIMA) and one is a hydro plant providing on-grid energy. It is estimated that 30,000 households will be reached through the former and 5 million through the latter. The third project, Kleen Energy will contribute

560 million Kwh of electricity to the national grid. The benefits to households will vary depending on whether they are on or off-grid. We detail the differences below.

Off-grid household benefits

SEFA outline the expected benefits to households from energy access, which are as follows:

- Value of savings on household lighting expenditure
- Use of savings (consumption, investment, savings)
- Health status (linked to reduced household air pollution)
- Hours spent studying at home
- Productive uses of electricity[40] (e.g. hours spent working to earn income (in-kind or cash))
- Hours spent on domestic/care work
- Value of savings on costs of phone charging
- Access to mobile phone
- Time required for essential communications
- Hours spent on leisure and using TV/ radio
- Access to radio and television
- Access to use of a refrigerator.

[40] PUE are defined as those that result in goods and services with a monetary value, hence enabling income generation

Unfortunately, we do not have data in most of these areas. Data were provided on savings from use of kerosene and number of children that have lighting for study. Whilst several studies demonstrate that lighting increases – on average – the amount of time school children spend studying at home (e.g. Barnes at al. 2014), this is not linked directly to improved school performance or future earnings in the literature. The report mentions 1,000 agri-businesses accessing small agricultural loans, but we have no further information on this. Given these constraints, only cost savings (kerosene and electricity) could be used for the SROI-informed analysis.

On-grid benefits

On-grid energy benefits the same types of stakeholders as off-grid – i.e. households, businesses and the public sector. Increased generating capacity may allow the grid to be extended as supply expands, enabling new connections to be made, or it may improve the reliability of supply to existing connections, or provide other benefits in terms of grid stability depending on the nature of the electricity (e.g. is it dispatchable or intermittent), where it is generated, and the existing quality and configuration of the grid. The maximum possible benefit that could result would be where all electricity produced was translated into new connections, and those connected had no previous access to electricity.

This is very unlikely on both counts. Even where additional capacity does lead to new connections, this is likely to be partial, as increased generating capacity is likely to be needed to improve the quality of existing supply. This is important. Inadequate power supplies impose heavy costs. For businesses, recurrent power outages mean forgone sales and damaged equipment (Eberhard et al., 2011). Households cannot reliably use cooking and other appliances and public services like health centres will struggle to use IT equipment critical for patient health and safety. Unreliable electricity supply forces many users, from households to large enterprises, to invest in backup generators (AfDB, 2018; Eberhard et al., 2011). Generator costs range from USD 0.3-0.7 per kilowatt-hour, which is often three times higher than buying the electricity from the public grid (Foster and Steinbuks, 2009).

However, the value resulting from improvements to the grid can only be calculated where reliability and access metrics are available. To do this properly would require a power systems reliability analysis (see Pueyo et al. 2015 for a discussion on the data requirements of power systems analysis). While this is likely to be beyond the scope of routine monitoring indicators, this type of information may be created by national energy production and regulation agencies.

Assuming we know the proportion of electricity that has gone towards improving current supplies and have been able to value this (a very challenging task), and can identify the additional connections that have been enabled by the extra supply, we cannot just conclude that this is all benefit. Some households without grid connections would have had access to diesel generators, so the economic benefit of the new connection would be the difference in the marginal cost between these – there would be a straight environmental benefit of avoided CO2 emissions of course.

What is clear, therefore, is that a figure for the additional volume of power going to the grid is insufficient for assessing the economic benefits unless more is known about a) the stability of the existing power grid, how extra supply affects the number (and location) of connections, the quality and quantity of supply to users at baseline, and the change in the marginal costs post intervention. This does not mean that nothing can be said, but it cannot be assumed that all additional electricity supply translates 100% into net benefits for a particular number of people.

Capacity building

AGF identified capacity building as a key benefit from NDF involvement. NDF's capacity building grant was used to upskill local banks on how understand and manage risks within the green SME sector in two ways. The first was to support the banks in how to lend to SMEs, where consultants were selected and used to train managers in how to assess green business risk. The second use of the grants was in marketing the facility to SMEs and providing them with access to the expertise needed to make them eligible for bank finance.

Pre- and post-training evaluations were administered to gauge the knowledge of the participants before and after the training on aspects of green economy and green finance. This was also a way to assess the effectiveness of the training workshops and the trainers. Results showed much improvement in the knowledge of the participants and their desire to utilize the knowledge to promote green finance and better service to SMEs. These evaluations have not been seen by the research team however, and these outcomes have therefore not been taken forward in the economic study.

Details on contribution to outcomes

AGF reported that they welcomed the NDF representation on the board. They told us that strategically NDF are 'doing the right things', especially given the limitations of a small funder in an area where large players have the most influence. It was also reported that big institutions have limitations regarding efficiency, reaction time and relationship management. It was also reported that the private sector in Africa needs a fast reaction time and that the larger institutions sometimes struggle with this.

Findings on additionality/complementarity

There are two ways in which the NDF involvement in the GGF was considered additional.

First, NDF introduced the concept of a specialized guarantee window to the AGF business model as well as the concept of targeting SMEs in the green economy, and this has been replicated with AFAWA as described above. While it is challenging for a small player to be additional in the climate finance, AGF suggest that it is not the amount that NDF give that is additional but the way that they give it. The CEO of AGF described it as follows:

"Before we had the NDF guarantee green business was a 'bad animal', and nobody wants to be the first person to fund that. The resale value of solar equipment is zero, which means that the collateral has no value. [What the GGF does] is come in and say 'I am your collateral'"

According to AGF, a second way they add value is through the impact on the wider AGF portfolio (20% of their investments are now green). AGF told us that they now consider green to be the 'future of the world'. Before NDF, they didn't understand the risks well enough, but NDF have brought them to the technology and in doing so have increased their market share. We have limited information to support these assertions apart from the responses from the interviewees. We address issues of additionality at length below, which is a central question in SROI analysis.

Findings on implementation issues

NDF as a partner and partner priorities

According to NDF, there is comprehensive engagement and consultation with the AGF team and other shareholders in the company. This was confirmed in interviews with AGF who spoke very highly of NDF and of the working relationship.

What is interesting is that NDF have shaped those priorities. Whilst AGF 'wanted to do something on green' they did not know what or how. Working with NDF has created the fund, but also influenced the wider portfolio and was described as highly aligned with the future strategy.

Alignment with mandate

AGF has a proven in-built leverage model. This was a motivating factor for NDF investment, so is not an example of an area where NDF considers itself to have had a catalytic role – this was already being driven by AGF. NDF provide preparatory grant funding in parallel to equity investment to support capacity development of AGF as well as partner banks and SMEs. The project is believed to have supported innovation by creating a new focus in AGF on climate and green growth. This was the first dedicated green guarantee window in Africa. There is also a clear private sector development (PSD) element. The project has identified an emerging issue by establishing AGF as an early platform and advocate for green finance in Africa with direct linkages to the commercial banking sector.

Private sector experience

The evidence from this case study would suggest a very positive working relationship between NDF and private sector, with both organisations describing the relationship positively. According to NDF, AGF are committed and professional and they welcomed the ambition of the leadership.

When asked about the move to new types of financing mechanisms and private sector involvement, AGF told us that grants only have a supporting role to play from their perspective. NDF will expect a 3% return on their total investment. The grant is embedded to increase the likelihood that the return will be realised. The grant should be treated as a loss that is factored in when calculating the return on equity.

NDF contribution to projects

NDF is not involved in the implementation of the project, nonetheless, it was a major reason why the GGF was instigated in the first place. Its contribution is therefore key. This manifests in the following ways:

1. Providing finance

2. Providing capacity-building support to lenders

3. Influencing the wider AGF portfolio

Nordic 'value added'

GGF also builds directly on a foundation of Nordic added value. Denmark is the largest AGF shareholder and has been involved since the earliest design and formulation discussions. Sida provided a USD 50 million re-guarantee line in 2014 which enables AGF to continue to develop business even after reaching its leverage ceiling. A second Sida re-guarantee line is under discussion.

Challenges in responding to needs related to SME access to green finance

There is still a major gap in SME access to green finance according to AGF. The current pipeline is four times what they issue (several hundred million dollars in value) and the market was described AGF as 'huge'. Whilst this is part of NDF's contribution (i.e. in creating the pipeline), it is also a problem because they cannot meet demand. Concern was expressed that the GGF would develop

a credibility issue by stimulating demand that cannot be met. The main issue highlighted therefore is that the GGF should be 2-3 times larger.

According to AGF, the SME financing gap in Africa is USD 300 billion. AGF want to reduce this by 1% every year. They are currently calculating the number of SMEs, jobs etc that this will translate into.

Economic assessment

An SROI model is an Excel-based set of calculations that compares the value of the outcomes to the costs of the investment. As described above, due to limitations of data and access to research participants, what is being presented here is an economic analysis informed by some SROI principles, rather than an SROI. This section summarises the outcomes included, the values that were used and the adjustments that were made for additionality, drop off and so on. It should be noted, that if data for all of the outcomes described was available it would substantially impact the estimated total value produced by the investment.

Table 17 summarises the outcomes that have been included.

Table 17 Outcomes taken forward in the economic assessment

Stakeholder	Outcome	Incidence	Source
The environment	Carbon emissions (direct)	10000	NDF
	Carbon emissions (direct)	15000	NDF
Households	Financial savings on kerosene and electricity	USD 583.4 million	AGF
Employees	Direct employment	3750	AGF
	Indirect employment	52000	AGF
	Temporary employment	1000	AGF
State	Tax	1500	AGF

How to assess additionality

Estimating the value of additionality is very challenging. In an SROI analysis, adjustments are made for three factors that attempt to isolate the net effect: deadweight, attribution and displacement. Although we have insufficient data to measure these concepts accurately, there is a benefit in exploring the logic of how they might be relevant to the intervention.

Deadweight is the most important of the concepts. It attempts to capture 'natural change', or the extent to which the outcomes would have happened anyway. For example, an important consideration in this analysis is whether the project could have been financed via other means.

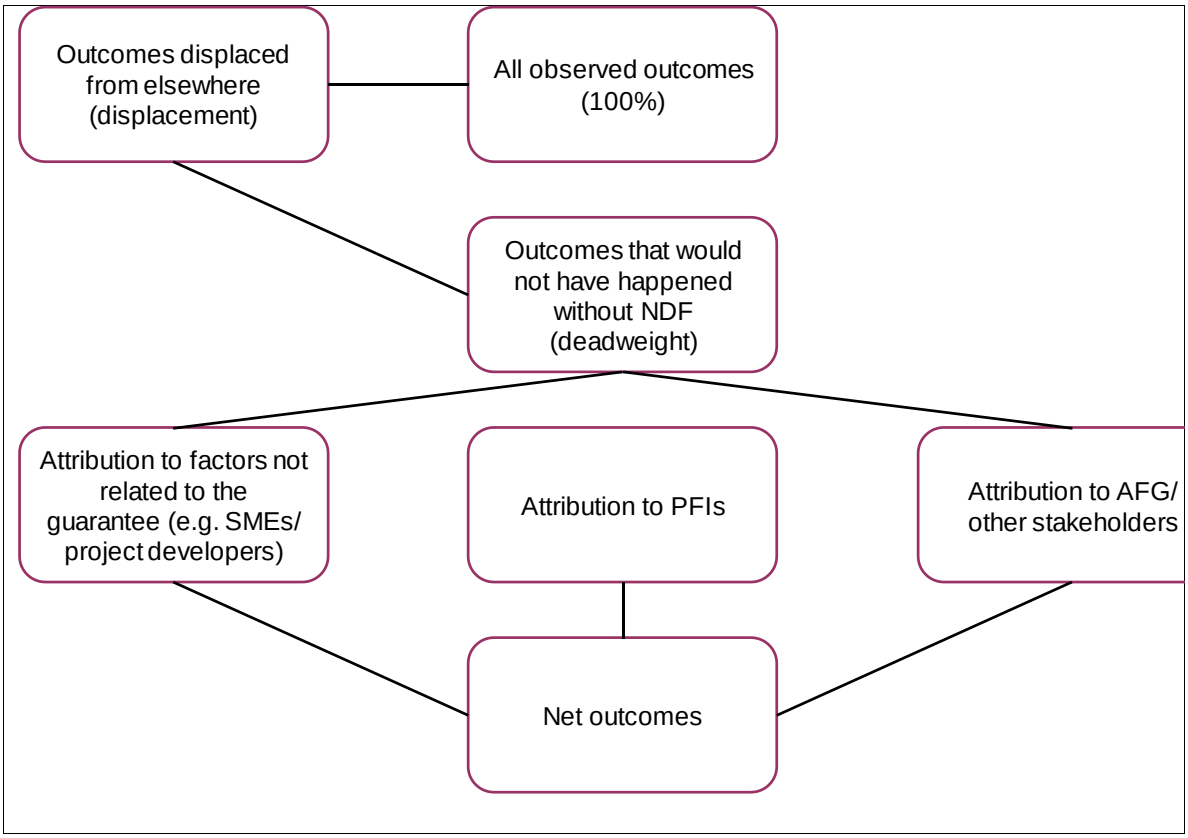
Attribution is an estimation of the proportion of the outcome that is the result of the intervention. Even if the project would not have happened without the NDF investment, there are other actors for whom some benefit is attributable in bringing energy to people's homes including the AGF, local banks, other financiers and SMEs. This is especially the case for the SIMA investments, which are a further step removed from the NDF investment. Although attribution is always hard to measure and is far from an exact science. However, it does require thought, and useful techniques such as contribution analysis have been developed that can help in this regard.

A **displacement/substitution** effect is the least important of the three and only relates to some outcomes. Although displacement/substitution should always be considered it will often be assumed to be zero. In the context of this study, one way in which displacement can have an impact is where finance is displaced from another activity, for example away from social projects towards

environmental projects (the greening of AGF). Although the net benefit may be higher from the environmental project, the social benefit it displaces should also be taken into account.

Once these adjustments have been made, only net outcomes remain – i.e. those attributable to NDF financing taking counterfactuals into consideration, as shown in Figure 7. As illustrated, attribution for NDF will vary by stakeholder type (i.e. it will be greater for core stakeholders and decrease as we move out to external stakeholders). This does not mean that core stakeholders are more important, or that the value created is necessarily higher, but NDF is closer to these stakeholders and can therefore have a greater impact on the likelihood that the outcome will take place.

Figure 7 Factors considered in additionality



We had limited primary data to inform the assumptions, with the result that estimates used are primarily based on secondary data. The same deadweight assumption was used for all outcomes (5.6%). This is the proportion of SMEs (in Kenya) that access finance via banks (KBS, 2016). As most of these projects are unlikely to be financed via family members (the main financing method), commercial finance is the only option. We know this is very constrained, so we assume that deadweight is low. For the outcomes considered in this part of the study, we assume zero displacement, as the only outcome where displacement is a risk is leverage and this was not taken forward due to lack of data.

Attribution to NDF was explored in interview. According to interviewees, attribution to NDF is high in terms of the environmental investments. Nonetheless, AGF administer the GGF, hold the client relationships and the GGF sites within the wider AGF institution. All of the benefit cannot therefore be attributed to NDF. We also need to consider the contribution of the lenders, the SMEs themselves and other intermediaries that are all making contributions towards the outcomes. For the purpose of this analysis, we provide some estimates on attribution below but recommend that these are considered further by NDF to arrive at plausible attribution estimates.

A central component of SROI is the inclusion of both traded and non-traded outcomes in the economic analysis. SROI aims to measure value rather than cost, and where necessary (i.e. for those outcomes that do not already have a financial value), employs financial proxies to do so. In this instance, due to the small number of outcomes included in valuation, the process is relatively straightforward as the outcomes are either already traded (e.g. kerosene) or valuations are easily available (e.g. carbon emissions). Table 18 sets out the rest of the valuations used.

Table 18 Valuation

Stakeholder	Outcome	Value	Rationale	Source
The environment	Carbon emissions (direct)	USD 39 dollar a tonne	Social cost of carbon estimate	EPA (2013)
	Carbon emissions (direct)	USD 39 dollar a tonne	Social cost of carbon estimate	EPA (2013)
Households	Financial savings	30,000	Saving on kerosene	Figure provided by AFG – need exploring further
Employees	Direct employment	3750.0	Average wages in formal SMEs	Kenyan Bureau of Statistics
	Indirect/temporary employment	3750	Average wages in formal SMEs	Kenyan Bureau of Statistics
State	Tax	27.5% of GVA	Tax on gross value added41 for energy SMEs based on corporation tax average for Kenya/Ghana	Kenyan Bureau of Statistics and author's calculation

Discussion of proxies used

For carbon emissions, there are several potential valuations that could be used, ranging from the proposed baseline traded price of carbon for South Africa,[42] (World Bank, 2019) to estimated global social costs of carbon that can run to USD 200 (Moore and Diaz, 2015). The social cost of carbon (SCC) is a measure, of the long-term damage done by a tonne of carbon dioxide (CO2) emissions in a given year (EPA, 2019). This dollar figure also represents the value of damages avoided for a small emission reduction (i.e. the benefit of a CO2 reduction). Following Baurzhan's (2017) cost benefit analysis of PV solar projects in SSA, we have used the US EPA's[43] estimate of the social cost of carbon (USD 39). The SCC for Africa is likely to be lower, given the lower level of development. On the other hand, the climatic impacts are likely to be high and there may be a rationale for employing much higher values. Either way, analyses should have country-specific costs of social cost of carbon. We recommend that NDF identify an appropriate carbon price/SCC for the countries in which it operates.

For households, we have used estimates on savings provided by AGF. These are USD 3.4 million per year via PEG-Ghana Ltd. and USD 580 million via SIMA. It is not clear if these figures are annual or cumulative. We have therefore assumed these refer to the length of the project (1 and 3 years respectively). It is not clear if the assumptions are empirical or estimated (e.g. surveying households or just assuming all now use zero kerosene). The latter would overestimate savings, as solar home systems reduce kerosene consumption, but do not eradicate it (Barnes et al. 2014). Neither is it clear whether these figures represent net savings to households (i.e. whether they take account of the costs such as installation and battery replacement). The project is only financially

[41] Gross value added is the balance between the total of sales (minus the variations of stocks) and the intermediate consumption (including raw materials and other operating costs at the exception of financial costs). It comprises of wages and salaries payments to social security funds and production-related

[42] South Africa is the only SSA country with a proposed carbon price

[43] https://19january2017snapshot.epa.gov/climatechange/social-cost-carbon_.html

beneficial to households if the marginal savings from kerosene use outweigh the marginal costs of solar supply. In addition to installation and battery replacement, some households may have to service loans. In a cost-benefit study for Bangladesh, for example, Haque (2016) calculates the cost of solar to be USD 177- USD 260 per household every five years. If we aggregate this to all the households benefiting from the PEG-Ghana ltd, project, this would be £4.8 million for the costs of installation alone and suggest a net negative figure for households in financial terms. In the absence of evidence to the contrary, however, we assume that the figures are net positive. On the other hand, the data provided only include a small number of savings. Most cost benefit studies include common benefits like charging mobile phones.

For employees, we have little information on the type or quality of jobs. As many of the estimates derive from indirect jobs in the SME sector, these are likely to be low paid or informal. We have therefore used the 2019 minimum wage for Kenya of USD 1596 per annum.

For tax, we have used the average corporation tax rate for Kenya and Ghana (27.5%) and taxable income as the average GVA for Kenyan energy firms (USD 60,000).

Benefit Period and Drop Off

The next step in the analysis is to project future value. To avoid over claiming we have projected outcomes for seven years, which is the life of the NCF lock-in period. It is possible that for some outcomes the benefit period may be longer (e.g. where companies grow and expand their workforce). A longer benefit period would have to take into account the replacement and disposal costs of batteries.

Drop off takes account of the reduction in the 'amount' of the outcome over time, or an increase in attribution for the outcome to other factors. A key feature here is the rate at which businesses fail. Although statistics were not available for Kenya and Ghana, in South Africa the failure rate is 50% within 2 years (McFaul, undated). This is similar to the failure rate in developed countries. We have assumed a similar rate of drop off but have assumed 0% after that due to lack of data on longer-term outcomes.

Finally, the input we have based the assessment on is the initial NDF investment of USD 7.6 million for the first pilot. We have applied a discount rate of 5%, which is the rate that AGF use.

Results

To arrive at a return on investment (ROI) ratio, each outcome was valued and projected over seven years with adjustments for additionality and drop off. The results show that the ROI is positive with a ratio of USD 2.42 for every dollar invested. However, this figure should be treated with caution for the reasons outlined above.

The output from this analysis is reproduced in Appendix 1. Although there are some major gaps, it also provides some interesting discussion points. The major source of value for the project comes from the value of employment to those that benefit. However, as discussed little is known about these jobs, which highlights the importance of more robust data collection for this indicator.

Another assumption that is sensitive to change is attribution. Table 19 outlines the assumptions used and the rationale.

Table 19 Assumptions on additionality used

Outcome	Rate	Rationale
Corporation tax	5.0%	Low attribution due to many stakeholders/variables involved in this outcome.
Emissions reduction (direct)	25.0%	Higher attribution due to climate change element being specific to NDF involvement. However, also attribution to other stakeholders
Emissions reduction (indirect)	25.0%	Higher attribution due to climate change element being specific to NDF involvement. However, also attribution to other stakeholders
Savings on kerosene	25.0%	Higher attribution due to climate change element being specific to NDF involvement. However, also attribution to other stakeholders
Direct employment	5.0%	Low attribution due to many stakeholders/variables involved in this outcome.
Indirect employment	5.0%	Low attribution due to many stakeholders/variables involved in this outcome.
Temporary employment	5.0%	Low attribution due to many stakeholders/variables involved in this outcome.

Assessment of data quality and gaps

As described earlier, the analysis was greatly hampered by data availability, and difficulties in accessing interviewees. Requests for interviews with beneficiaries and M&E staff at AGF were unsuccessful and there was limited access to NDF staff whilst carrying out the analysis. This frustrated attempts to include key outcomes and to verify the veracity of data supplied by AGF. These are summarised in Table 32.

Table 20 Evidence matrix

Stakeholder	Short-term outcome	Data?	Medium/long-term	Data?
SMEs (direct)	SME growth	No	Improved incomes/livelihoods	No
AGF/PFIs	Improved capacity to lend to green SMEs	Qualitative evidence	Greater profitability	No
SMEs (indirect)	More climate finance available	Some evidence	Greater access to finance	No
	Increased demand for goods and services for SMEs in supply chain	Numbers reached	SME growth	No
Women-owned SMEs	SME growth	No	Improved incomes/livelihoods	No
	Leadership and influence in community	No	Gender equality outcomes	No
Employees (direct)	New jobs	Yes	Improved incomes/livelihoods	No
Employees (indirect)	New jobs	Yes		No
Employees (female)	As with entrepreneurs	No	As with entrepreneurs	No
Shareholders	Return on investment	Yes	More finance available for new investments	No
Households	Access to energy	Yes	Economic impacts on earnings and reduced expenditure on	Kerosene but not mobile charging

			kerosene/mobile charging	
	Children can study in the evenings	Number of children only	Improved school performance	No
	Fewer black carbon emissions	No	Fewer negative health impacts	No
SMEs	Access to electricity	Yes	Improved productivity	No
Environment	GHG emissions avoided	Yes	Contribution to climate change mitigation	Yes
Public services	Access to electricity	No	Better quality health services (e.g. refrigeration of medicine) and schools (e.g. lighting, ICTs)	No
State	Taxes paid by SMEs	No	More funding available for public services	No

Conclusions and recommendations

The Green Guarantee Facility (GGF) is responding to a clear need for green finance in Africa, which the evidence suggests could have a wide range of social and economic benefits. It is an example of a case in which NDF has the potential be very impactful – via the fund itself – but also via wider changes in the portfolio of the African Guarantee Fund. AGF have endorsed the partnership and are very complementary about the working relationship and NDF's contribution in the climate finance world. Due to the success of this investment, NDF have invested a second tranche of funding. Whilst AGF welcome a deepening relationship and the decision to invest further is understandable, there is an argument that this could be less impactful than the initial investment. However, NDF argue that this tranche has discreet objectives relating to scaling up and attracting new investors, which will be additional. Nonetheless, as discussed in the body of the report, there are risks that additionality will be lower with follow-on investments, which may be greater for more successful investments.

This is a relatively new investment (and one of the first equity investments) and is an example of the kind of investment that NDF would like to be making in the future An economic analysis based only on a limited number of outcomes suggests that the fund is having a positive return on investment. Unfortunately, due to data limitations, it is not possible to be very confident in the findings and the figures should be treated as exploratory. NDF recognise this, and a study to verify the outcomes data reviewed here was already being planned when this evaluation commenced. The study is expected to be procured by end of 2019 and completed in 2020.

The qualitative findings from this case study would also suggest that there is potential to add value through investments of this kind due to the potential for leverage and influence. The key weakness in the data is not just the need to verify it, as NDF are planning, it is the need to move beyond outputs, most notably numbers of households connected, or the volume of energy produced. To really understand the development and climate impacts, it is necessary to know how energy is being used, by whom and to what extent. It is also necessary to know what energy they were using at baseline and what changes have come about as a result of those connections. Renewable energy represents a cost to households, and sometimes they face long run financial repayments to meet these costs. It is important that the cost benefit for households is also positive and that they are not left with costly inefficient infrastructure that is being underutilised. We recommend that NDF explore these issues further in their proposed evaluation project. For further

recommendations on data collection, including relating to renewable energy, please see the main body of the report.

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Annexes

Annex 1: Table summarizing economic assessment

Outcome area	Total population	Deadweight proportion	Attribution proportion	Displacement proportion	Units after deadweight	Units after attribution & deadweight	Value	Total Value Produced	Benefit period	Drop off	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Total Value
Corporation tax	1500	5.6%	5.0%	0.0%	1416.0	70.8	£18,000	£1,274,400	7.00	0.25	$1,274,400	$955,800	$716,850	$716,850	$716,850	$716,850	$716,850	$5,814,450
Emissions reduction (direct)	10000	5.6%	25.0%	0.0%	9440.0	2360.0	£39	£92,040	7.00	0.25	$92,040	$69,030	$51,773	$51,773	$51,773	$51,773	$51,773	$419,933
Emissions reduction (indirect)	15000	5.6%	25.0%	0.0%	14160.0	3540.0	£39	£138,060	7.00	0.25	$138,060	$103,545	$77,659	$77,659	$77,659	$77,659	$77,659	$629,899
Savings on kerosene	30000	5.6%	25.0%	0.0%	28320.0	7080.0	£113	£802,400	7.00	0.25	$802,400	$601,800	$451,350	$451,350	$451,350	$451,350	$451,350	$3,660,950
Direct employment	26250	5.6%	5.0%	0.0%	24780.0	1239.0	£1,464	£1,813,896	7.00	0.25	$1,813,896	$1,360,422	$1,020,317	$1,020,317	$1,020,317	$1,020,317	$1,020,317	$8,275,901
Indirect employment	2000	5.6%	5.0%	0.0%	1888.0	94.4	£1,464	£138,202	7.00	0.25	$138,202	$103,651	$77,738	$77,738	$77,738	$77,738	$77,738	$630,545
Temporary employment	26000	5.6%	5.0%	0.0%	24544.0	1227.2	£1,464	£1,796,621	1	0.25	$1,796,621							$1,796,621
Total											$6,055,618	$3,194,248	$2,395,686	$2,395,686	$2,395,686	$2,395,686	$2,395,686	$21,228,297
Present value																		$18,072,304
ROI																		$2.32

Annex 2: List of documents consulted

- NDF website
- AGF website
- Board consideration (2016)
- Board consideration (2018)
- AGF Green Guarantee Report (February, 2018)

Annex 3: List of persons interviewed

Charles Weatherill, NDF Project Manager

Felix Bikpo, CEO, African Guarantee Fund

Case Study C99 – responsAbility Renewable Energy Holding company (rAREH)

List of Acronyms

Acronym	Meaning
BMW	German Federal Ministry for Economic Cooperation and Development
BoD	Board of Directors
IC	Investment Committee
KfW	German Development Bank
NDF	Nordic Development Fund
rAREH	responsAbility Renewable Energy Holding Company
RE	Renewable Energy
SSA	Sub-Saharan Africa
TA	Technical Assistance

Background and context

Key data

Name: **responsAbility Renewable Energy Holding (rAREH)**; Ref: NDF C99
Country/Region: Sub-Saharan Africa with initial focus on East Africa (Kenya, Rwanda, Uganda, Tanzania)
Approved NDF equity: EUR 7 million
NDF grant: EUR 0.5 million
Board approved: June 2017
Other key dates: shareholder agreement signed in July 2017, conditions for disbursement met in August 2017
Project implementation: 2017-2025 (when project development activities are assumed to stop)
Partner agency: responsAbility/ responsAbility Renewable Energy Holding Company (rAREH)
Co-financing: USD 0.5 million by responsAbility; USD 41.5 million by other investors
Total capital base after second call: USD 75 million; first call KfW provided initial capital USD 25 million
Implementing agency: rAREH

Background to the project

rAREH was established by responsAbility Investments AG in conjunction with the German Federal Ministry for Economic Cooperation and Development (BMZ) and the German Development Bank (KfW). It is a private company with limited liability under Mauritian law and was founded in December 2013 with seed capital of USD 25.5 million that was invested by KfW on behalf of BMZ. rAREH focuses on exploiting long-term opportunities in the Renewable Energy (RE) sector in Sub-Saharan Africa (SSA) across multiple technologies. To achieve this, it invests in and develops small-scale power plants. These plants will initially take the form of run-of-the-river, small-scale hydro and biomass energy generation facilities in East Africa that have secure, long-term power purchase agreements with national grid operators or other creditworthy off-takers. The company is managed in Zurich and Nairobi by responsAbility Investments AG, one of the world's leading independent asset managers specialising in development-related sectors of emerging economies.

rAREH has identified a gap in the market. On the one hand, there is an existing and constantly growing demand for the supply of electricity and there is investor interest in the SSA area. On the other hand, many countries in Sub-Saharan Africa are large and population density is low. One solution is for the energy supply to be decentralised. However, there are insufficient small to

medium-sized projects close to (rural) communities that could deliver this. rAREH aims to this gap by developing and implementing greenfield projects that can become sustainable in the long run. Greenfield projects are projects which rAREH develops themselves, by constructing new RE plants. In contrast, projects are considered brownfield when rAREH purchases an existing facility to begin RE production which rAREH does to a lesser extent (see section "responsAbility Investments AG and rAREH").

Background to the NDF investment

NDF invested in rAREH in 2017, four years after it was founded. By supporting rAREH, NDF helps rAREH materialise the projects in the pipeline and act as a catalyser for further investments by other Development Finance Institutions (DFI) and private investors. rAREH's target for 2017 was to raise USD 50 million and by that increase the total capital base to USD 75 million. The capital base is expected to reach 125 mUSD in 2019 and 200mUSD in 2020-2021. USD

Overall objective: The overall objective of supporting rAREH is to help them increase the renewable energy supply in Sub-Saharan Africa (SSA) with an initial focus on East Africa. It aims to do this in an ethical and responsible way and at the same time generate a long-term, stable cash flow across a diversified portfolio of renewable energy plants.

NDF investment: According to NDF, rAREH fit well with NDF's strategy and mandate, in the following ways:

- Enables them to leverage private investors,
- Has a clear mitigation focus, and
- Provided NDF the opportunity to engage in equity investment

rAREH invests in its own greenfield projects. In addition, the company has in its current pipeline projects co-developed with six different local private developers. These projects are expected to generate about 70 MW at a total cost of about USD 100 million. rAREH has acquired two operating renewable energy plants (brownfield investments). The NDF support is provided through two forms:

Equity: Investments into small to medium-sized RE projects with capacity up to 50 MWNDF's equity financing will be used for investing in the equity portion of projects that rAREH is involved in. That typically means setting up Special Purpose Vehicles/Entities (SPVs), usually comprising of 30% equity and 70% debt (in some cases even 100% equity), which will own and operate the assets once they are fully developed. rAREH aims at holding the whole equity portion.

TA grant: NDF is contributing to the TA grant. The grant portion is earmarked for rAREH's Technical Assistance Facility, which aims to build capacity with local promoters and financial institutions and support the development of renewable energy projects that rAREH expects to invest in. The TA Facility has two aims

1. To mitigate the shortcomings of renewable energy generation markets, which rAREH is facing when developing and investing in renewable energy power plants in SSA, and
2. To facilitate access to know-how and expertise for local promoters. KfW has provided initial capital of EUR 1.5 million and the additional funding need is expected to be EUR 5.5 million for the next five years.

Examples of assistance provided from the TA facility include:

- Support early stage project preparation (e.g. geotechnical study, hydrology study, etc.)
- Pre-feasibility and feasibility study
- Enhancement/improvement of existing studies

- Support local financial institutions to lend to renewable energy projects on a project finance base

The beneficiaries of the TA facility are the SPVs rAREH intends to invest in. As per NDF, TA policy, projects supported by TA and that reach financial close will then repay the TA support, making the TA facility a revolving fund. However, as there will inevitably be some projects that will not be able to reimburse the costs, the funds will eventually deplete. For that reason, and as it takes time for the SPVs to start generating positive cash flow, there is a need for TA seed funding.

responsAbility Investments AG and rAREH (responsAbility Renewable Energy Holding)

responsAbility is a USD 3 billion impact asset manager based in Zurich with a dedicated focus on emerging market investments. responsAbility employs about 250 people in 20 offices around the world and manages 12 investment solutions in the financial, energy and agriculture sectors, which invest in fixed-interest securities as well as equity investments. responsAbility intends to raise an additional USD 50 million for rAREH. responsAbility itself directly holds 1% of the capital of the company and will maintain a 1% participation until a capitalisation of USD 50 million has been reached. There is a Management Agreement to this effect between responsAbility (the Manager) and rAREH (the Company).

Corporate governance of responsAbility Renewable Energy Holding (rAREH) is executed by three key bodies: the Shareholders, the Board of Directors (BoD) and the Investment Committee (IC). rAREH's mission is to increase the renewable energy supply in Sub-Saharan Africa at a reasonable price and in a responsible way, while generating attractive, long-term, stable cash flow across a diversified portfolio of renewable energy plants. The aim is to develop, own and operate small to medium-sized renewable energy infrastructure projects. Projects can be entirely or partly owned by rAREH.

Table 21 Information on rAREH

	Description
Company	responsAbility Renewable Energy Holding
Domicile and legal structure	Mauritius, private company limited by shares under the laws of Mauritius
Manager	responsAbility Investments AG, a company limited by shares according to the Swiss Code of Obligations, will provide management services to the Company with its local team in Kenya.
Inception date and capitalization	December 2013, USD 73.6 million (as per September 2018)
Term	The Company has an unlimited term
Minimum investment	USD 250,000 for institutional investors; USD 250,000 for private investors
Company objective	The Company aims to develop, build and operate a portfolio of long-term participations in the clean-tech sector, especially renewable energy projects or companies in sub-Saharan Africa. Energy-producing investee companies typically produce up to 50MW either for grid-feeding purposes, captive consumption or local distribution.
Investment targets	Small, grid-connected power plants with a capacity of up to 50 MW that use renewable sources (hydro, solar, wind, geothermal, biomass) in East Africa to generate electricity in a cost-effective and sustainable manner.
Valuation policy	For the financial statements under IFRS, the portfolio will be valued according to the Company's equity valuation policy, which is based on and in compliance with the International Private Equity and Venture Capital (IPEV) Valuation Guidelines.
Dividends and expected return	Subject to compliance with Mauritian law and prior recommendation of the Company's Board and the decision taken by the shareholders, net proceeds attributable to the disposition of an investment, and any dividends or interest income received with respect to an investment, may be distributed pro-rata to the respective shareholdings. The expected internal rate of return (IRR) is 10%–12% p.a.,

	Description
	net of fees, expenses and performance fee. The target return is not a projection, prediction or guarantee of future performance, and there is no guarantee that the target return will be achieved.

Source: Particip based on Q4 report 2018

Status rAREH projects

rAREH Board has approved a **total development/construction budget of USD 54.3 million for 15 projects** (see Table 22). Some of these investment decisions pre-date the investment entry of NDF

Currently, three projects are in operation. One project (Rwaza) has been developed by rAREH. The other two were existing, brownfield projects and were acquired by rAREH.

An additional 12 projects are under development. Six projects are in late development stage and will reach financial close in 2019. Four projects are in mid-stage and the remaining ones are in early stage. rAREH is in the process of acquiring two brownfield projects, the Mpanga (18 MW) and Nyamwamba (9.2 MW) hydropower plants from South Asia Energy Management Systems (SAEMS) in the Republic of Uganda (full ownership) and a significant minority shareholding in Renewable Energy Holdings (Pty) Ltd (REH), a holding company that owns three operational hydropower plants totalling 11.5 MW.

Table 22 rAREH projects in operations and in development

Project status	Technology	Country	MW	Total rAREH Project equity requirement (USD)
Projects in operation				
Rwaza I	Hydro	Rwanda	2.7	7,950,000
Projects in development				
Makindu Solar	Solar	Kenya	33.0	8,900,000
Nyamindi-Cascade	Hydro	Kenya	15.5	8,250,000
Embu Ishiara	Hydro	Kenya	10.0	8,600,000
Sisi	Hydro	Uganda	7.0	7,900,000
Simu	Hydro	Uganda	9.5	5,000,000
REH Zambia (Portfolio)	Hydro	Zambia	40.0	24,300,000
REH South Africa	Hydro	South Africa	11.5	7,000,000
Mpanga & Nyamwamba	Hydro	Uganda	27.2	18,800,000
Sokoto Solar PV	Solar	Nigeria	55.0	7,000,000
Solar ERA	Solar	Sierra Leone	5.0	7,900,000
Tiapata	Hydro	Guinea Conakry	25.0	14,000,000
Nkhotakota I & II	Solar	Malawi	41.0	14,500,000
Nyamwamba II	Hydro	Uganda	7.8	6,100,000
Sesheke Solar PV	Solar	Zambia	20.0	5,500,000

Source: rAREH Quarterly report Q4 2018

Norfund

The Norwegian Investment Fund for developing countries (Norfund) is the Norwegian state-owned development finance institution mandated to develop sustainable enterprises in poor countries. Norfund invests in clean energy, financial institutions and agribusinesses. The main

investment region is Sub-Saharan Africa, as well as selected countries in Asia and Latin America. Clean energy is the largest component of Norfund's portfolio and includes investments in hydro, solar and wind power projects. Norfund acquired 14% share in rAREH.

KfW development bank

The KfW is a German state-owned development bank. The KfW provides financing to governments, public enterprises and commercial banks engaged in microfinance and SME promotion in developing countries. The main sectors are water supply and sanitation, renewable energy and energy efficiency, as well as the development of the financial sector[44].

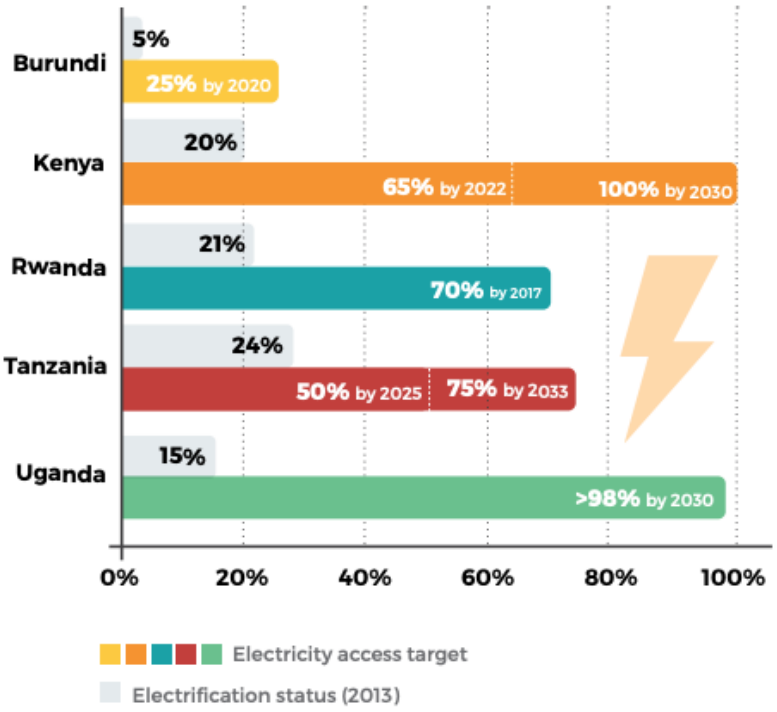
Complementary information on context and needs

Context energy demand and supply

Around 600 million people in SSA still have no access to electricity. In East Africa, less than a quarter of the population has access to electricity and some of the lowest national electrification rates in the world. The electrification rates in rural areas are particularly low.

This, combined with economic growth in the region, has led to high demand. In East Africa, energy demand is expected to grow by 5.3% annually to 2020, meaning that the region's power generation capacity will have to increase significantly to meet new and existing demand. Projections indicate that capacity will have to grow by 37.7% in Uganda, 75.3% in Tanzania, 96.4% in Kenya and 115% in Rwanda (UNIDO&REN21 2016). Figure 8 compares existing electrification rates with targets in a selection of East African countries.

Figure 8 Electrification rate (2013) and electricity access targets in East Africa



Source: UNIDO&REN21 2016

[44] Website KfW Development Bank: https://www.kfw-entwicklungsbank.de/International-financing/KfW-Entwicklungsbank/

The increasing demand combined with the region's vast natural resources, represent a major opportunity for renewable energy investors. Solar irradiation levels are high due to proximity to the equator, wind speeds are some of the strongest on the continent, hydropower resources are plentiful, and the Great Rift Valley is a promising source for geothermal power.

Renewable energy investments in Sub-Saharan Africa

Until recently, renewable energy projects in sub-Saharan Africa were mostly limited to hydropower projects due to the prohibitively high generation costs of other power sources. Consumer electricity tariffs in the region are low, as are consumption levels outside of major urban areas, which has reduced the profit potential. However, as generation costs have plummeted the economics have shifted. Solar plants in southern Africa are estimated to pay for themselves within three years, and costs for utility-scale onshore wind and geothermal projects are now at level with fossil fuel projects. This gives renewable energy companies an opportunity to gain a foothold in a market that is only expected to expand, due to rapid population growth and rising GDP levels (Gordon 2018)

Renewable energy investment in developing countries surpassed that in industrialised countries for the first time in 2015. Africa attracted USD 12.5 billion in renewable energy investment, up from USD 8 billion in 2014. Nevertheless, the potential of renewables to meet energy needs across the power, heating and cooking, and transport sectors has not been harnessed to-date. Particularly, the EAC region still faces significant private investment challenges: in 2015, it accounted for only some 4% of renewable energy investments in Africa.

Gordon (2018) describes the potential of smaller-scale projects in the area of renewable energy in SSA to be vast. Such projects can make a significant contribution towards supplying rural areas with electricity. At the same time, they are of a manageable size - making them easier than large plants to develop, finance and construct, while at the same time having less of an impact on the environment. Multiple challenges faced by investors in each country can prevent projects from securing international financing. But from an investor's perspective, decentralised, off-grid solutions can reduce some of the biggest risks associated with foreign companies in SSA– notably land access, security risks, and high levels of bureaucratic inefficiency and corruption (Gordon 2018).

Stakeholder mapping and NDF's role in the project

Stakeholder mapping

rAREH: Investment company. Corporate governance of rAREH is executed by three key bodies: the Shareholders, the Board of Directors (BoD) and the Investment Committee (IC). rAREH has engaged responsAbility Investments AG to provide day-to-day management services.

Investors/shareholders: NDF, Norfund, KfW, responsAbility who aim for both return on investment and development impact.

Local communities: Local rural communities in Sub-Saharan Africa are the main beneficiaries through access to electricity (on/off-grid?)

Employees: Existing and new employees at rAREH company and project level for who rAREH creates jobs. rAREH creates jobs for male and female as well as vulnerable groups (e.g. people with disabilities).

Local economy: rAREH achieves market and infrastructure development, enhancing local economies.

Environment: Producing clean energy reduces the carbon intensity of energy, having positive effects on the environment/climate.

Project outputs and NDF's role in the project

Project outputs

According to the last available rAREH quarterly report for Q4 2018, the following outputs have been achieved so far:

So far, NDF has disbursed 5.6 EUR million in equity, the remaining 1.4 EUR million will follow in 2020 (Board Document).

TA grant: The TA fund has received EUR 1.5 million from KfW as initial capital and NDF disbursed an additional EUR 0.5 million in one tranche in 2017.

NDF's role

NDF plays a role in the governance of rAREH and its strategic goal setting. Four organisations are represented on the rAREH board: NDF, KfW, Norfund and responsibility. In addition, there are two Mauritian board members (as the company is based in Mauritius). In practice, however, the latter do not participate in voting/decision-making.

NDF is a minority shareholder in rAREH, representing around 11% of the total subscribed capital after the second financing round. In addition, NDF provides part of the TA grant funding. NDF is not involved in the daily management of rAREH (or its projects). This is done by responsAbility and the local rAREH team. For Environmental, Social & Governance (ESG) monitoring, for example, NDF relies on rAREH. NDF staff is also represented on the TA committee of the project

According to Norfund, NDF could increase its responsibilities and influence by also joining the Investment Committee. Nevertheless, NDF is a member of the Technical Assistance committee where TA is closely connected to the projects and thus NDF can influence the projects to some extent.

Outcome analysis

This section presents the outcome mapping per stakeholder, details on the main outcomes achieved as well as details on NDF's contributions to those outcomes.

Outcome mapping

In this section we map the main outcomes for each stakeholder (see section "Stakeholder Mapping" for the list of stakeholders) and describe each outcome and how it is expected to be achieved.

By developing RE projects, local rural communities in Sub-Saharan Africa will have access to clean energy. Access to clean energy has many positive effects for the communities, for example being able to cool medication and store food. This in turn leads to increased well-being and improved livelihoods. In addition, RE companies will be part of the local economy, creating jobs and contributing taxes.

At the company level, rAREH has provided jobs and capacity building for the local teams. At project level, rAREH provides high-skilled jobs for engineers and low-skilled jobs during the construction phase and during operation of the energy assets, i.e. once the RE plants are running. rAREH provides jobs for both male and female employees and could provide jobs for specific vulnerable groups (e.g. people with disabilities).

It is assumed that the market and infrastructure development will increase the demand for goods and services and contribute to wider economic development. It is expected that this will indirectly improve livelihoods and improve public services. Finally, producing clean energy will lead to climate stability by reducing the carbon intensity of energy.

Table 23 Summary table for the outcome mapping

Stakeholder	Short/medium-term outcome	Medium/long-term outcome	Description
Shareholders	Return on investment	More finance available for new investments. Greater impact in achieving development outcomes	Development-oriented investors
Local (rural) communities (direct)	Increased access to affordable clean energy (number of new connections)	Improved livelihoods	By developing RE projects, more households will have access to clean energy. Access to clean energy brings numerous benefits to communities (for example being able to store food and medication).
Local (rural) communities (direct)	Improved access to decent jobs	Improved livelihoods	At project level, RE companies will be part of local economy, creating jobs during construction and operation of the RE plants. These are formalised jobs, providing stable income and job security as well as training opportunities and on the job training.
Local (rural) communities (indirect)	Increased tax base	Improved public services	RE companies will be part of local economy, contributing taxes contributing to public value.
rAREH employees (male)	Increased access decent jobs	Improved livelihoods	At company level, rAREH created jobs for locals. These are formalised jobs, providing stable income and job security as well as training opportunities and on the job training.
rAREH employees (female)	Increased access decent jobs	Improved livelihoods	Same as above
rAREH employees (people with disabilities)	Increased access decent jobs	Improved livelihoods	Same as above
Environment	Emissions avoided	Climate change mitigation	RE projects generating clean energy. Climate stability though cleaner air.
Local economy	Increased market and infrastructure development	Increased demand for goods and services/ more private sector activity	Building local independent power producer staffed mostly by locals. Construction of infrastructure such as roads and bridges to gain access to construction side. Expanding infrastructure and upgrade technology for supplying energy services.

Details on main outcomes achieved

Outcomes achieved are based on the latest available rAREH quarterly report for Q4 2018 and well as the E&S performance report for 2018. These outcomes are reported at rAREH company level. These are thus outcomes for all investors and do not take into account the contribution of the various shareholders. Most indicator data is reported on quarterly basis, highlighting the released cumulative data (based on projects that have reached the construction and/or operational phase) on portfolio level as well as rAREH's contribution (rAREH contribution = equity% rAREH x full project Impact (note that this not applied under markets & infrastructure). The details on employees employed at rAREH company level, are reported on annually in the E&S report.

Table 24 Outcomes achieved so far

Stakeholder	Short/medium-term outcome	Indicator	Achieved so far
Shareholders	Return on investment	Internal Return on Investment (IRR)	According to the latest Q4 report, the internal rate of return (IRR) was 5.42 (since inception,%).
Local (rural) communities (direct)	Increased access to affordable clean energy (number of new connections)	Number of people connected	Realised cumulative portfolio: 279,130 rAREH contribution: 83,739
Local (rural) communities (direct)	Increased access to decent jobs	Number of Jobs During Construction (FTE[45])	Realised cumulative portfolio: 303 rAREH contribution: 91
		Number of Jobs During Operations (FTE)	Realised cumulative portfolio: 187 rAREH contribution: 141
Local (rural) communities (indirect)	Increased tax base	Sum of paid taxes	Realised cumulative portfolio: USD 0 rAREH contribution: USD 0
rAREH employees (male)	Increased access to decent jobs	Number of male employees (management, non-management, consultants, board)	Management: 3
			Non-management: 11
			Consultants: 2
			Board: 7
rAREH employees (female)	Increased access to decent jobs	Number of female employees (management, non-management, consultants, board)	Management: 0
			Non-management: 7
			Consultants: 2
			Board: 0
rAREH employees (people with disabilities)	Increased access to decent jobs	Number of employees with disabilities (male and female)	Male: 0
			Female: 0

[45] Full Time Equivalent

Stakeholder	Short/medium-term outcome	Indicator	Achieved so far
Employees at project level	Increased access to decent jobs	Number of Jobs During Construction (FTE)	Realised cumulative portfolio: 303 rAREH contribution: 91
		Number of Jobs During Operations (FTE)	Realised cumulative portfolio: 187 rAREH contribution: 141
Employees at project level (female)	Increased access to decent jobs	Number of Jobs During Construction (female) (FTE)	Realised cumulative portfolio: 43 rAREH contribution: 13
		Number of Jobs During Operations (female) (FTE)	Realised cumulative portfolio: 6 rAREH contribution: 2
Environment	Emissions avoided	Avoided GHG Emissions	Realised cumulative portfolio: 0 rAREH contribution: 0
		MWh Produced	Realised cumulative portfolio: 0 rAREH contribution: 0
Local economy	Increased market and infrastructure development	Number of Projects	Realised cumulative portfolio: 1 rAREH contribution: 0
		Number of Countries	Realised cumulative portfolio: 1 rAREH contribution: 1
		Installed Capacity (MW)	Realised cumulative portfolio: 2.7 rAREH contribution: 0.81

Note: realised = based on projects that have reached the construction and/or operational phase
To see how KPI are calculated, please see section "data gaps/quality".

As we can see, many have not yet been achieved due to early stage of implementation. Box 2 depicts the targets that are foreseen to be achieved in 2023. Note that there are no targets for number of employees (male, female, people with disabilities) at company level and no targets for female employees during construction or operation at project level.

Box 2 rAREH targets for 2023

The following targets are set for 2023:
610,000 MWh/year of renewable electricity produced and fed into the local/national grid
7.3 million people to use electricity produced by project companies
USD 84 million in taxes paid by project companies
3,500 job during construction
114 jobs in project companies during operation
350,000t CO2 emissions avoided p.a.
610,000 MWh/year of renewable electricity produced and fed into the local/national grid
13 project companies financed
5 investment countries.

Findings regarding economic assessment

As we can see from Table 3, most of the NDF outcomes have not been achieved yet but are forecasted to do so in the future. This is not necessarily a problem for an SROI analysis, as it is possible to forecast potential for value creation based on good quality forecasts. Nevertheless, more detailed assessment of the targets listed in Box 1, and following discussions with experts in renewable energy measurement, we have decided that the data, as currently presented are insufficient to complete an SROI. The main projected outcome is for households connected via renewable energy and the benefits that flow from this. However, there is a problem with the form in which these data a presented, which renders them inappropriate for inclusion in an economic study (see 3.2.1). One option would have been to exclude them from the analysis. This ran two risks. First, SROI principles require that all material outcomes are included in an analysis, and these are clearly highly material. Second, there is a risk that the return ratio would be negative but due to omitted data. This would be a potentially misleading finding from what may be a very valuable investment. Further information is provided on this in the main body of the report and the AGF case study, including a full set of recommendations for ways to address these issues in the future.

3.2 1 On grid energy production

Access to energy can provide benefits three different groups:

- Households (with discreet benefits for women and school children)
- Businesses (with discreet benefits for women)
- Public services

No information is available on businesses or public services benefiting. We do have information on the number of households that will benefit by 2023 (7.3 million). To estimate the number of households connected, raREH use the indirect calculation method, which is typically used for grid connected projects. These calculate this by dividing the Projects Energy Production by the Per Capita Electricity Consumption. This is illustrated in the following example:

(A) Project Output: KWh 100,000,000 p/a

(B) Consumption Per Capita: KWh 100 p/a

(C) People Connected = A/B = 1.0 million

However, although this is standard practice, incorporating these data into an economic analysis presents challenges. Increased generating capacity may allow the grid to be extended as supply expands, enabling new connections to be made, or it may improve the reliability of supply to existing connections, or provide other benefits in terms of grid stability. However, this depends on the nature of the electricity, and to fully understand this, we would need to know:

a) whether it is dispatchable or intermittent),

b) where it is generated, and

c) the existing quality and configuration of the grid.

The maximum possible benefit that could result would be where all electricity produced was translated into new connections, and those connected had no previous access to electricity (the approach assumed by the methodology above). Unfortunately, this is very unlikely on both counts. Even where additional capacity does lead to new connections, this is likely to be partial, as increased generating capacity is likely to be needed to improve the quality of existing supply.

All of this matters. We know that inadequate power supplies impose heavy costs. For businesses, recurrent power outages mean forgone sales and damaged equipment (Eberhard et al., 2011). Households cannot reliably use cooking and other appliances and public services like health centres will struggle to use IT equipment critical for patient health and safety. Unreliable electricity supply forces many users, from households to large enterprises, to invest in backup generators (AfDB, 2018; Eberhard et al., 2011). Generator costs range from USD 0.3-0.7 per kilowatt-hour, which is often three times higher than buying the electricity from the public grid (Foster and Steinbuks, 2009).

However, the value resulting from improvements to the grid can only be calculated where reliability and access metrics are available. It is not as simple as assuming that renewable electricity fed into the grid means that those users receive 100% of the potential energy benefits available. For example, we would need to know the tier of access that beneficiaries have before and after, the change in the marginal cost of that electricity and the associated benefits (e.g. whether they are now making Productive Use of Electricity (PUE)) (see AGF case study for more information on this).

Assuming we know the proportion of electricity that has gone towards improving current supplies and have been able to value this (a very challenging task), and can identify the additional connections that have been enabled by the extra supply, we cannot just conclude that this is all benefit. Some households without grid connections would have had access to diesel generators, so the economic benefit of the new connection would be the difference in the marginal cost between these – there would be a straight environmental benefit of avoided CO2 emissions of course.

What is clear, therefore, is that a figure for the additional volume of power going to the grid is insufficient for assessing the economic benefits unless more is known about a) the stability of the existing power grid, how extra supply affects the number (and location) of connections, the quality and quantity of supply to users at baseline, and the change in the marginal costs post intervention. This does not mean that nothing can be said, but it cannot be assumed that all additional electricity supply translates 100% into net benefits for a particular number of people.

To do this properly would require a more involved methodology for data capture such as power systems reliability analysis (Pueyo et al. 2015). Power system reliability analysis generally aims to make assessments of the proportion of time for which all electrical demand cannot be supplied by the power system, or of the amount of energy which is demanded by users and not supplied. Schmitz et al. (2015) set out the data requirements for a power systems analysis.

Table 25 Data requirements for a power systems analysis

Element of the system	Data
Supply	List of generating stations including planned additions and anticipated retirements Availability statistics for each generator
Demand	Historic time series of demand Estimates of supressed demand due to generation constraints Relative priorities given to meeting difference tranches of demand
Balancing supply and demand	Assessment of flexibility of the system to meet up and down ramps of net demand (demand minus renewables) Estimate of balancing costs: new investments in flexible conventional technologies or hydro required to take up more intermittent renewables
Transmission infrastructure	Capacity and properties of transmission lines Network operational security measures (e.g. reducing transfer capacities between regions to improve resilience against sudden fault events)
Additional risk factors	For example: theft, supply chains for fuel, areas of political instability etc.

Source: recreated by Particip GmbH from Schmitz et al. 2015

While this is likely to be beyond the scope of routine monitoring indicators, this type of information may be created by national energy production and regulation agencies. What is clear, is that whilst the figure for the additional volume of power going to the grid may be useful for illustrative purposes (i.e. to anchor the volume of electricity by converting to a number of users), it is too imprecise a proxy, carrying an insufficient amount of information on value to be incorporated into an economic assessment.

Contribution to outcomes (incl. NDFs' leverage)

All interviewees agreed that NDF played an active role in the board and had a catalytic role and leverage effect. There was some divergence of opinions on whether rAREH would have gone ahead with alternative finance without NDF's investment: while the representative from rAREH was of the opinion that this would not have been the case, the other interviewees were more cautious. Without NDF'S investment, rAREH's development might have slowed down. There was no agreement on whether current outcomes could have been achieved without NDF's investment. In general, rAREH's outcomes can only be partly attributable to NDF. Moreover, NDF joined rAREH four years after its foundation. NDF did not contribute to the initiation or greatly contributed to the design of rAREH. According Norfund, NDF slightly influenced the design of rAREH when Norfund was pushing for rAREH to have a more corporate-like company structure rather than a fund structure and NDF supported Norfund in this. Based on the available evidence, we can assess the level of contribution to "medium".

Table 26 Level of outcome attribution to NDF

Level	Meaning	Score
High	Outcome is completely the work of NDF	100%
Quite high	The outcome is a small part due to the work of other organisations	75%
Medium	Other organisations have a significant role	50%
Quite low	The outcomes are mostly as a result of other organisations	25%
Low	The outcomes are entirely due to the work of other organisations	0%

NDF influence rAREH's implementation in a passive way. In this research we identified the examples of ways in which NDF has influence.

- Its (active) participation at board level. When rAREH develops projects proposals, it has to get the approval from the Investment Committees (IC). The IC (comprised of industry experts) then gives recommendations to the board based on their assessment. The board ultimately decides what projects to develop based on the IC's assessment as well as the consideration of 'the bigger picture'. The board meets regularly to review the strategy and business results of the

company. As NDF has (in practice) 1 out of 4 votes, NDF has an equal, still significate influence compared to the investment size (being a minority shareholder with 11% ownership stake).

- NDF provided some contributions rAREH in 2017 when NDF asked for the inclusion and monitoring of development/impact indicators in the quarterly reports. NDF also asked rAREH to include clear targets (in figures) for women and vulnerable groups in the hiring plans. According to Norfund … NDF has a great focus on issues such as poverty reduction and ensures that rAREH's projects have wider social and environmental impacts.
- NDF contributed EUR 0.5 million to the TA fund. This was considered important as KfW had only provided initial capital and Norfund does not provide capital to the TA fund.
- Norfund with support from NDF contributed to the design of the company structure of rAREH.

NDF has some influence at project level through the TA committee.

In terms of NDF's leverage, the Board document and interviews described that, while KfW and Norfund were positive to the idea of investing in rAREH in the second financing round, Norfund would only go in if there was another investor in addition to KfW and KfW also conditioned their second investment on the participation of additional financiers. NDF could be seen to have filled that role and thereby "leveraged" both Norfund's and KfW investment (a total of 41.5 USD). However, there is a risk of double counting here, as it is also the case that they may claim that they leveraged NDF's investment.

Looking to the future, once rAREH is making profits and paying dividends, private sector investors are more likely to come in as shareholders. The first profits are currently expected to be in 2020 and these will be reinvested in the company with the first dividends projected to be paid in 2023. rAREH's goal is to raise USD 200 million by end 2020, of which more than USD 50 million would come from the private sector. NDF would at this early stage be playing a critical role in helping rAREH reach its target. It could be argued that NDF could, with its preliminary ownership percentage of 11%, claim a direct catalytic impact of at least EUR 5.5 million from private investors and EUR 22 million from other public investors. On a local level, NDF's funds is likely to leverage more local developers to be partners in the projects. According to NDF, during the Due Diligence mission, it was made clear that private sector investors are interested in investing but are waiting for other investors to take the initial risks. Once rAREH starts to show financial results, it may attract significant private investments.

Findings on additionality/complementarity

Financial additionality: The evidence from this case study suggests that the case for financial additionality is plausible. In brief, the argument is that with the first two rounds of equity funding (USD 75m) rAREH will make investments in RE, which will be commercially successful, thus attracting private sector finance for further equity raising rounds. In addition, NDF (and other present public sector investors) also serve as anchor investors whose presence will provide further comfort to future investors and will reduce their perception of risk. In addition, NDF had a leverage effect in the second financing round (see section "Contribution to outcomes (incl. NDFs' leverage)".

Patient capital: In the interviews, NDF was seen to add value in providing more patient capital, i.e. their return on investment expectations are lower. According to NDF, this will make it easier for other investors to come in and will help develop better projects (e.g. not acquire brownfield projects).

TA grant: As only KfW invested in TA, not Norfund, NDF's contribution to the TA fund was welcomed. The TA is necessary, for example, for environmental or feasibility studies. These help to avoid risks and have a more stable project portfolio. The TA grant was also used to build the capacity of the local team. The aim was to build a team comprised of mostly locals, to ensure that employment benefits could be captured by local people. The TA grant therefore supported the commercial and social viability of the project.

Overall governance: At board level, NDF was seen to be complementary to the other investors, i.e. being active in providing direction to the rAREH team and being able to find consensus with the other investors. NDF was described as the funder who 'tries to understand a project idea (engaged), and once they have understood it, they use their instruments and tools to add to the concept (add value)."

Other: Due to its size, NDF was not seen to play a (major) role in the global climate architecture. Interviewees agreed, however, that NDF plays a role as niche a flexible funder. NDF was described as 'small and swift', having fewer requirements (e.g. in terms of target beneficiaries) and being able to take risks.

Findings on other issues

Alignment with mandate

NDF mandate: As all projects are focusing on renewable energy, the proposal is well-aligned with NDF's climate mandate with mitigation being the principal objective. rAREH and NDF's investment priorities are aligned as both focus development impact (next to commercial viability).

Innovation: Innovation is treated vaguely in the Board doc: Clean and renewable energy production of this kind (small and medium-sized) provides great opportunities to try new technologies and set-ups, including with local participation in development and operation. Local populations can benefit greatly in addition to the energy supply, as rAREH develops community involvement plans, hiring plans, etc.

Private sector development: Investment supports the private sector SPVs for the operation of RE production.

Risk-taking: The investment in rAREH is an example of NDF taking a different sort of risk than in more traditional NDF projects. NDF takes equity risk and an investment in rAREH requires a long-term commitment, with no certainty of return. There are also other financial, environmental and social risks involved with the development of greenfield projects (especially political risks in Sub-Saharan Africa).

Alignment to partner priorities

According to rAREH, NDF is aligned with their priorities, i.e. non-financial performance is as important as financial returns. According to rAREH, few funders have the same values.

As mentioned earlier, NDF has influenced the impact reporting of rAREH. According to the Q4 2018 report, a framework has been developed by responsAbility linking the six impact themes with the global agenda of the UN Sustainable Development Goals ("SDGs"). NDF also asked rAREH to include clear targets (in figures) for women and vulnerable groups in the hiring plans and the E&S performance reports state the number of female and people with disabilities.

Experience with private sector

Working with the private sector was described by NDF as positive. According to NDF, the private sector actors are easier to work with compared to traditional investors. The private sector was perceived as being more pro-active, smaller and more flexible, i.e. being able to take decisions faster. In addition, the reporting was perceived as being better. Nevertheless, NDF also needs to put in more effort from a legal perspective when working with the private sector as more agreements need to be in place (ranging from shareholder agreements to investment guidelines).

According to rAREH and responsAbility, NDF could 'punch above their weight' by working with the private sector.

Catalytic effect

As described earlier, NDF may have had a catalytic effect during the second financing round when Norfund and KfW conditioned their investment on the participation of additional financiers. It is assumed that once rAREH is making profits and paying dividends, private sector investors are likely to come in as shareholders. The first profits are currently expected to be in 2020 and dividends in 2023. It is too early therefore to fully answer the question of catalytic effect.

Nordic 'value added'

According to NDF and the Board document, NDF can create Nordic value added in two ways.

1/ NDF can share knowledge from several climate change projects in NDF's portfolio that covers geothermal, solar and hydropower. In the case of NCF and the EEP Trust Fund for Southern and East Africa, both provide grant support for early-stage upstream development of projects focused on renewable energy. Both have the potential to generate pipeline opportunities for consideration and possible take-up by rAREH, and NDF is well-placed to provide some simple networking to ensure that these opportunities do not get missed. However, according to NDF, this has not materialised so far.

2/ Nordic companies can be suppliers to rAREH's projects and for the Rwaza Hydro project in operation in Rwanda, this has materialised.

In the interviews with responsAbility, 'Nordic added value' was not understood as NDF defines it. According to responsAbility, NDF could potentially add 'Nordic value' by leveraging further Nordic financing. It was said that NDF could be a door-opener in the future - as Nordic investors like to co-invest with each other and NDF enjoys a good reputation in the Nordics.

Assessment of data quality and gaps

Data gaps/quality related to outcomes (incl. contribution to outcomes)

Table 27 Evidence matrix

Stakeholder	Short/medium-term outcome	Data availability	Calculation/ assumptions
Shareholders	Return on investment	The internal rate of return (IRR) are available for all quarters since inception in December 2013.	Inception date: 13 December 2013. Includes calculation based on NAV.
Local (rural) communities (direct)	Increased access to affordable clean energy (number of new connections)	KPI "people connected". The Q reports provide numbers for portfolio, pipeline, realized cumulative and rAREH's contribution.	Number of people connected to the electricity generated by the project companies (proxy for addressing needs of low-income groups). To calculate the number of people connected, an indirect calculation method is used, which is typically used for grid connected projects. Calculated by dividing the Projects Energy Production by the Per Capita Electricity Consumption. Example: (A) Project Output: KWh 100,000,000 p/a (B) Consumption Per Capita: KWh 100 p/a (C) People Connected = A/B = 1.0 million
Local (rural) communities (direct)	Increased access to decent jobs	KPI "Number of Jobs During Construction" and "Number of Jobs During Operations. The Q reports provide numbers for portfolio, pipeline, realized cumulative and rAREH's contribution. Number of trainings or on the job trainings not monitored.	Figures based on actuals when available (proxy for livelihoods supported from investments). Otherwise, based on best estimate technical team. Realized number of female employees is measured as well.
Local (rural) communities (indirect)	Increased tax base	KPI "Sum of paid taxes". Q reports provide numbers for portfolio, pipeline, realized cumulative and rAREH's contribution.	Sum of all taxes to be paid by project companies to the government during the life of the project (proxy for public value contribution). Taxes include the Corporate Income Tax and Withholding Tax, and other taxes if applicable.

Stakeholder	Short/medium-term outcome	Data availability	Calculation/ assumptions
rAREH employees	Increased access to decent jobs	Annual E&S report provides numbers of employees (male and female) at management, non-management, consultant and board level. Number of trainings or on the job trainings not monitored.	Figures based on actuals at company level.
rAREH employees (female)	Increased access to decent jobs	Same as above (for females)	Same as above.
rAREH employees (handicapped)	Increased access to decent jobs	Same as above (for handicapped employees – male and female)	Same as above.
Environment	Emissions avoided	KPI "Avoided GHG emissions" and "MWh produced". Q reports provide numbers for portfolio, pipeline, realized cumulative and rAREH's contribution.	Avoided GHG: Annual CO2 Emission Reduction = MWh per annum, times Grid Emission Factor (tons CO2/MWh) Grid Emission Factor per country can be found on the UNFCCC or UNDP websites. Assumption: All pipeline projects are green energy and it is expected that any emission during construction will be offset. Emissions avoided based on assumption that any additional energy produced would not come from renewable sources. MWh Produced: MWh produced per annum – based on actuals.
Local economy	Market and infrastructure development	KPI "number of projects", "number of countries" and "installed MW capacity". Q reports provide numbers for portfolio, pipeline, realized cumulative and rAREH's contribution.	KPIs based on actuals but assumption that RE companies will have trickle-down effects. No data/reports available to support claims.

rAREH contribution = equity% rAREH x full project Impact (note: not applied under markets & infrastructure).
Portfolio: > IC approval.
Pipeline: > Go approval.
Realised: > based on projects that have reached the construction and/or operational phase.

Data gaps/quality related to other issues

For C99, the team had good access to interviewees and data (rAREH provided access to their data storage, including confidential reporting.). The rAREH team made clear that the focus was to collect data that can be collected easily, without the need for great financial or human resources rather than providing a complete picture of rAREH's impact. Some of the KPIs are only indirect measurements or based on assumptions. In particular, the proxies "taxes paid" and "number of projects" for human well-being and local economy development are based on major assumptions

and little is done to support claims. Whilst the need for a lean approach is understood, the data quality was found wanting when it came to carrying out SROI analysis. Were such an analysis to be attempted in the future, more resource would need to be invested in better quality data collection.

Lessons learnt

From interviews:

- The level of influence can be high in equity/private sector cases, more than with traditional MDB partners. In this case, NDF's influence is high compared to the size of their investment. NDF's catalytic effect was seen to be larger when investing in (innovative) companies like rAREH.
- Thanks to the management being done by asset manager responsAbility, NDF could reach a return on investment with relative low management and in-house costs.
- NDF joined rAREH early on; according to Mats this should be added to the mandate. NDF has 'little added value in coming late in projects, i.e. when NDF cannot steer the direction anymore'.

From review of existing data:

- The existing method of on-grid data collection and assessment of benefits is limited. Were NDF to wish to conduct more rigorous analysis of this investment, a more sophisticated approach would be required.

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Annexes

Annex 1: List of documents consulted

Project documents
rAREH Board document, final consideration, June 2017
rAREH Detailed Project Performance Rating, not dated
rAREH Quarterly report Q1 2018
rAREH Quarterly report Q2 2018
rAREH Quarterly report Q3 2018
rAREH Quarterly report Q4 2018
rAREH Annual E&S performance report, January 2019
rAREH Investment Guidelines

NDF project-related websites (accessed 12 April 2019)
responsAbility Renewable Energy Holding Company (rAREH) [NDF C99]
https://www.ndf.fi/project/responsability-renewable-energy-holding-company-rareh-ndf-c99

Context
Godon, E. (2018): The Politics of Renewable Energy in East Africa; The Oxfor Institute for Energy Studies, August 2018; OIES Paper EL 29; https://www.oxfordenergy.org/wpcms/wp-content/uploads/2018/08/The-politics-of-renewable-energy-in-East-Africa-EL-29.pdf

UNIDO, REN21 (2016): East African Community Renewable Energy and Energy Regional Status Report; http://www.ren21.net/wp-content/uploads/2016/10/REN21-EAC-web-EN.pdf.pdf

Annex 2: List of persons interviewed

Organisation	Stakeholder sub-category	Contact person	Position
NDF		Mats Slotte	Project Manager
rAREH	Local partner organisation	Jerome Niessen	CEO
responsAbility	Collaborators	Rochus Mommartz	CEO
responsAbility	Collaborators	Simon Gupta	Head Business Development DFI/IFI
Norfund	Co-financing partner (private sector)	Tore Horvei	Director, Thunder Energy
Norfund	Co-financing partner (private sector)	Inge Stolen	Senior Investment Manager

Annex 12: Interview schedules for internal/external interviews and case study interviews

Data protection statement

Introduction

This is part of a broader evaluation of NDF, commissioned by the EBA, the Expert Group on Aid and being managed by Particip GmbH. It will identify what is working well and where improvements could be made to inform its future strategy.

Data protection statement

This interview will take about 45 minutes. Your participation in this interview is voluntary. You may choose not to participate. If you decide to participate, you may change your mind at any time. If you decide not to participate in this study or if you withdraw from participating at any time, you will not be penalised in any way. Please ensure you are clear on the purpose of this evaluation.

We will do our best to keep your information confidential. All data is stored in a password protected electronic format. To help protect your confidentiality, the interviews will not contain information that will personally identify you. The results of this study will be used for research purposes only and will not be seen outside of the research team. If you have any questions about the research study, please contact Stephen Spratt: stephen@justeconomics.co.uk

Verbal Consent: By agreeing to interview, you are confirming that you voluntarily agree to participate and that you are at least 18 years of age

Agree

Disagree

Partner interview

1. Institutions, relationship to NDF, and view of NDF's strengths/weaknesses

    1.1 How would you describe your organisation and your role within it?

    1.2 What is your relationship to NDF?

    1.3 What contribution has NDF made to your work together and/or to climate change and development objectives more generally?

    1.4 How important/essential was NDF to the initiation, design and impact that has been achieved through the projects it is involved in?

    1.5 What are NDF's strengths? What areas could be improved?

    1.6 How well known is NDF? What is NDF's reputation in the sector?

NDF's financing instruments, structure and scale

    1.7 After 2016, NDF has moved from purely grants to using loans. Do you think this makes sense? Are there any risks with this, and how could they be addressed?

    1.8 From what you see, do you think NDF selects, and blends, instruments appropriately for different investments?

    1.9 Which types of organisation should NDF partner more/less with? (e.g. private sector, MDBs, other climate finance institutions?)

    1.10 What does NDF need to do to enable it to work more with organisations such as yours (and others that you think it should cooperate more with?

    1.11 Should NDF be bigger, smaller or stay the same size? Why?

    1.12 Are you familiar with NCF? What is its reputation? What does it add? Is the challenge model effective? How could it be improved?

Impact

    1.13 What do you think are the main social and environmental benefits from NDF's work? Where do you think it is having the most impact? What could it do to enhance its impact?

    1.14 Does NDF measure impact as well as it could? What should change?

    1.15 Has NDF affected the way you think about and/or measure impact?

Future strategy and collaboration

    1.16 Within the climate change and development sphere, what are the key challenges that NDF should focus on going forward? What might NDF need to change to support this?

    1.17 What do you hope will be your relationship between NDF going forward? What needs to happen to support this?

    1.18 What are the main constraints/risks to NDF? How might these be minimised?

    1.19 Do you have anything further to add?

Staff interview

1. Mandate and governance

1.20 How would you describe your role (probe: time in post, previous relevant experience)?

1.21 Do you think NDF's governance arrangements are effective? (probe: relative importance of country priorities; agreement/tension; interference)?

1.22 How could the governance structures be improved??

1.23 How do you understand NDF's mandate, and how does NDF choose investments to deliver on this? (probe: strong/weak areas; reasons)

1.24 How do you understand and apply the 'Nordic element' of the mandate? (Probe: Nordic brand, quality of applicants, Nordic reputation, Nordic know how, values, economic impacts)

1.25 Is NDF's mandate 'fit for purpose'? What would you change?

NDF's financing instruments, structure and scale

1.26 Do you welcome the move from grants to loans/equity – are there any risks with this? (probe: what is the optimal balance between grants and non-grants?)

1.27 Do you think NDF selects, and blends, instruments appropriately for different investments? What could it do better? (probe: how unique is this among development actors?)

1.28 Does NDF have the right partners? Which type of partners should it work more/less with?

1.29 Does NDF have the right staff? Are there areas where you need more staff? Why?

1.30 Should NDF be bigger, smaller or stay the same size? Why?

1.31 Do you think NDF's current funding arrangements work well? What would you change?

1.32 Do you think NCF functions well? What does it add? Is the challenge model effective? How could it be improved?

Impact

1.33 What are the main social and environmental benefits from NDF's work? Where do you think you are having the most impact? (probe on: Climate mitigation, adaptation, gender, poverty, inequality, leveraging finance, PSD?)

1.34 Does NDF measure impact as well as it could? What should change?

Future strategy

1.35 What are the key challenges that NDF should focus on going forward? Why (probe: how do these relate to NDF's strengths/weaknesses)

1.36 What does NDF need to change to support this?

1.37 What should NDF do more of/less of to maximise impact? (probe on financing instruments, geography, sector, scale, partners)

1.38 What are the main constraints/risks to NDF achieving this? How might these be minimised?

1.39 Do you have anything further to add?

Board interview

1. About the Board's role and NDF's mandate

1.40 How long have you been in this position?

1.41 How would you describe the role of the board at NDF?

1.42 How does the cross-country, Nordic composition of the Board work in practice (probe: relative importance of country priorities; agreement/tension)?

1.43 How could the Board work better?

1.44 How do you understand NDF's mandate, and to what extent does NDF choose investments that deliver on this? (probe: different national priorities vs. agreed positions)

1.45 How do you understand the 'Nordic element' of the mandate? Do you think NDF applies this appropriately? (Probe: Nordic brand and quality of applicants, Nordic reputation, Nordic know how, Nordic values, economic impacts)

1.46 Is NDF's mandate 'fit for purpose'? What would you change?

NDF's financing instruments and scale

1.47 Do you welcome the move from grants to loans/equity – are there any risks with this? (probe: what is the optimal balance between grants and non-grants?)

1.48 Do you think NDF selects, and blends, instruments appropriately for different investments? What could it do better? (probe: how unique is this among development actors?)

1.49 Does NDF have the right partners? Which type of partners should it work more/less with?

1.50 Should NDF be bigger, smaller or stay the same size?

1.51 Do you think NDF's current funding arrangements work well? What would you change?

1.52 Do you think NCF functions well? What does it add? Is the challenge model effective?

Impact

1.53 What are the main social and environmental benefits from NDF's work? where are they having the most impact? (probe on: Climate mitigation, adaptation, gender, poverty, inequality, leveraging finance, PSD?)

1.54 Does NDF measure impact as well as it could? What should change?

Future strategy

1.55 What are the key challenges that NDF should focus on going forward? Why (probe: strengths/weaknesses)

1.56 What does NDF need to change to support this?

1.57 What should NDF do more of/less of to maximise impact? (probe on financing instruments, geography, sector, scale, partners)

1.58 What are the main constraints/risks to NDF achieving this? How might these be minimised?

1.59 Do you have anything further to add?

Control Committee interview

1. About governance and NDF's mandate

1.60 How long have you been in this position?

1.61 How would you describe the role of the Control Committee at NDF? How could it be more effective

1.62 How does the cross-country, Nordic composition of the Board work in practice?

1.63 How could the Board work better?

1.64 How do you understand NDF's mandate, and to what extent does NDF choose investments that deliver on this?

1.65 How do you understand the 'Nordic element' of the mandate? Do you think NDF applies this appropriately?

1.66 Is NDF's mandate 'fit for purpose'? What would you change?

NDF's financing instruments and scale

1.67 Do you welcome the move from grants to loans/equity – are there any risks with this?

1.68 Do you think NDF selects, and blends, instruments appropriately for different investments? What could it do better?

1.69 Does NDF have the right partners? Which type of partners should it work more/less with?

1.70 Should NDF be bigger, smaller or stay the same size?

1.71 Do you think NDF's current funding arrangements work well? What would you change? Why?

Impact

1.72 What are the main social and environmental benefits from NDF's work? where are they having the most impact?

1.73 How additional is NDF?

1.74 How could NDF enhance its impact?

1.75 Does NDF measure impact as well as it could? What should it change?

Future strategy

1.76 What are the key challenges that NDF should focus on going forward? Why?

1.77 What does NDF need to change to support this?

1.78 What should NDF do more of/less of?

1.79 What are the main constraints/risks to NDF achieving this? How might these be minimised?

1.80 How could the wider system of Nordic sustainable development institutions be improved?

1.81 Do you have anything further to add?

External interviews

1. Governance, and general view of NDF
    1.82 How would you describe your engagement with NDF?
    1.83 How do you understand NDF's mandate, and how does NDF deliver on this?
    1.84 NDF is mandated to apply a 'Nordic element' to its activities? How do you understand this? How do you think it is applied in practice? How does it differ from yours?
    1.85 Do you think NDF's governance arrangements (e.g. the Board) work well? (e.g. the cross-country representation?) What could be changed to improve governance?
    1.86 What is NDF's reputation among Nordic institutions? What are considered its strengths/weaknesses?
1. NDF's instruments, financing, structure and scale
    1.87 After 2016, NDF has moved from purely grants to using loans. Do you think this makes sense? Are there any risks with this?
    1.88 From what you see, do you think NDF selects, and blends, instruments appropriately for different investments? What could it do better?
    1.89 Does NDF have the right partners? Which type of partners should it work more/less with?
    1.90 Should NDF be bigger, smaller or stay the same size? Why?
    1.91 How should NDF be funded?
    1.92 Are you familiar with NCF? What is its reputation? What does it add? Is the challenge model effective? How could it be improved?
2. Impact
    1.93 What do you think are the main social and environmental benefits from NDF's work? Where do you think you are having the most impact?
    1.94 How additional is NDF?
    1.95 In what ways could NDF enhance its impact?
    1.96 Does NDF measure impact as well as it could? What could it do to improve this?
3. Future strategy
    1.97 What are the key challenges that NDF should focus on going forward? Why?
    1.98 What does NDF need to change to support this?
    1.99 More broadly, how should the system of Nordic development institutions evolve? What needs to change for this?
    1.100 What are the main constraints/risks to NDF? How might these be minimised?
    1.101 Do you have anything further to add?

Annex 13: Methodology for the evaluation of the Nordic Climate Facility (NCF)

Evaluation scope and focus of the analysis

The project was scoped by NCF to focus on calls 7-9. As these projects are in very early stages of implementation, performance or development impact of individual projects cannot be assessed by this evaluation. In addition to what was set out in the proposal however, some research activities have been carried out with calls 5-6 to strengthen and contextualise the findings.

The evaluation questions cover three main themes/dimensions. The first relates to NCF's performance. The second to NCF as a challenge fund and the third to NCF's relevance and added value within NDF (i.e. the extent to which it is contributing to organisational objectives and the complementarity or otherwise of the two entities).

Dimension 1: Assessing the performance of NCF

Sub-dimension 1a: Assessing the performance of NCF at outcome level

EQ1.1 What are the expected outcomes from NCF's work? What evidence is there that NCF is achieving those outcomes?

EQ1.2 What evidence is there that NCF's ways of working are best placed to achieve its outcomes? What evidence is there that NCF is set up institutionally to optimise its way of working (e.g. staffing levels, governance structure, transaction costs, timeliness etc.)?

Sub-dimension 1b: Assessing NCF as a Challenge Fund

EQ1.3 What can we learn about NCF as a Challenge Fund? Is it effective to use Challenge Funds to achieve its goals and are NCF using the mechanism to good effect?

EQ1.4 How does NCF compare with other Challenge Funds? What can we learn from other Challenge Funds to make NCF more effective?

Dimension 2: Assessing NCF's relevance and value-addition within NDF

EQ2.1 What are the synergies between NCF and NDF and how do they diverge? Is the relationship between the two entities complementary? Are their areas where it could be improved?

EQ2.2 How does NCF fit within the range of funding mechanisms available to NDF i.e. what can we learn from the parallel NDF evaluation to inform NCF's strategy?

Key methodological elements

Overall approach

The study consisted of the following four evaluation activities: i) Theory of Change (ToC) development, ii) literature review, iii) data collection and analysis, iii) synthesis and dissemination.

A Theory of Change workshop was undertaken with NCF staff and the ToC (Annex 14) was developed through further consultation with NCF. At the same time, a comprehensive review of the challenge fund literature and NCF documentation was carried out. Initial interviews were then conducted with NCF and NDF staff. These data were used to develop two partner surveys (n=45): one for calls 7-9 and one for calls 5-6 that addressed partners' perceptions of NCF as a financer. Finally, interviews with partners (n=6) took place to explore some of the survey responses in more

detail. This evaluation also benefits from the findings from the NDF evaluation, carried out by the same research team. Most notably, interviews with the NDF board covered both NCF and NCF and questions were included with international climate finance experts on NCF. Also, the findings from the research on global climate finance architecture are relevant here.

Details on data collection

The surveys received a very good response (n=45). Out of a total of 23 projects in 7/8 (total survey population of 46), we had 26 responses (17 Nordic partners and 9 developing country partners). In 5-6, out of a total of 16 projects and a survey population of 32, we had 19 responses (13 Nordic and 6 developing country).

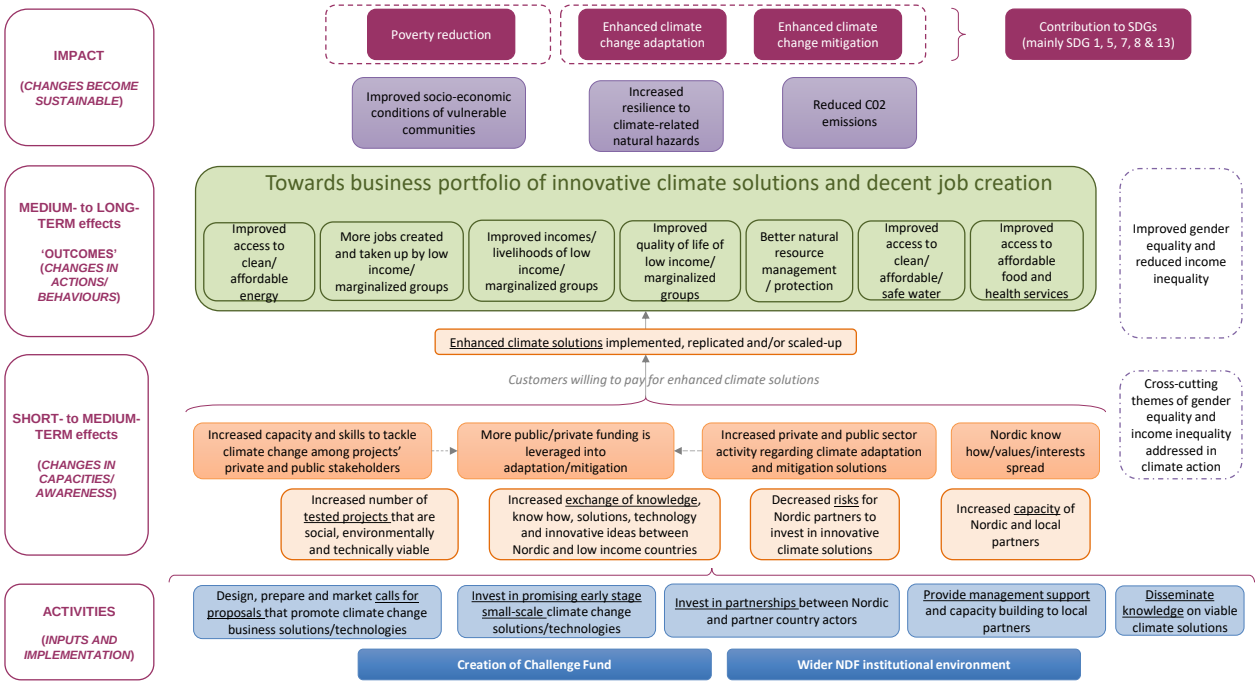
Most respondents represented for-profit companies and organisations (n=28), followed by Non-profit organisations/social enterprises (n=8). The share of for-profit companies and organisations was relatively higher for 7/8 and the share of non-profit organisations/social enterprises was higher for 5/6, which is consistent with the portfolio mix of these funding rounds

Permission was asked to contact the respondents to participate in interview. In both surveys about half gave consent. Responses were then filtered by whether they had applied to a challenge fund in the past to allow the research team to explore comparisons with other funds. The remaining respondents were further filtered by Nordic or developing country location and the round they applied in. Six interviewees were randomly selected for interview. Six interviews were successfully conducted (4 Nordic, 2 DC). One of the interviews was with a historical project from round 5 and the remaining 4 were with rounds 7 or 8.

Limitations

There are several limitations to this evaluation. First, it is scoped to evaluate rounds 7-9, which are only at the application or grant agreement stage. It is therefore more of a process, rather than an outcomes evaluation. Nonetheless, outcomes are a focus of the evaluation questions and some knowledge of outcomes is required to answer the future-oriented questions. To address this, the evaluation has done several things: a) Include a literature review on challenge fund outcomes, b) extend the survey to rounds 5/6 and c) ask interviewees to report on their perspective that outcomes are being achieved. However, as Elliott (2013) points out, challenge fund evaluations often rely on partner reports, which have a strong potential for bias (i.e. they are receiving funding and thus have an incentive to report positively). Therefore, whilst the evaluation was designed to only include core and connected stakeholders and does not have the benefit of good outcomes data to draw upon, every effort has been made to capture outcomes data in the partner survey. What we can see also is that partners appear to be reporting quite honestly as there is a mix of positive and negative in the responses. Finally, some external perspectives on NCF have been gathered through the NDF evaluation and these are incorporated as appropriate.

Annex 14: ToC NCF



Annex 15: Detailed survey data NCF

Consent

100%

Question: Which region is your organisation based in?

Total: 30 Partners from the Nordic region, 15 from developing countries. 26 respondents for 7/8 and 19 for 5/6.

The survey includes responses of 17 Nordic Partners and 9 Partners in developing countries (2 in Asia, 4 in Africa in and 3 in Latin America) for Round 7 and 8.

For Round 5 and 6, there are 13 Partners in Nordic regions and 6 partners in developing countries (3 in Asia, 1 in Africa and 2 in Latin America).

Question: What type of organisation do you represent?

Total: Most respondents represented for-profit companies and organisations (n=28), followed by Non-profit organisations/social enterprises (n=8). The share of for-profit companies and organisations was relatively higher for 7/8 and the share of Non-profit organisations/social enterprises was higher for 5/6.

The majority of NCF partners in Round 7 and 8 are for-profit companies and organizations (81%; n=21), followed by Research institutes and universities (12%; n=3) and non-profit organisations/ social enterprises (8%, n=2). Note that no Civil society organisations (CSOs) participated in the survey for Round 7 and 8.

For Round 5 and 6, only 37% (n=7) of the Partners are For-profit companies and organisations, followed by 32% (n=6) Non-profit organisations/social enterprises and Research institutes/universities (11%, n=2). Furthermore, there are two Civil Society Organisation (one in the Nordic region, one in a developing country) included in the survey in Round 5 and 6.

Question: Which round of NCF did you apply to?

47% (n=8) of the Nordic Partner applied for Round 7, 29% (n=5) for Round 8 and 24% (n=4) for both Rounds.

22% (n=2) of the Partners in developing countries applied for Round 7, 44% (n=4) for Round 8 and 33% (n=3) for both Rounds.

Question: Can you tell us if the following areas were included in your project/service/solution and at what stage?

Total: 73% of all respondents had a gender focus in the original concept note, 92% had a development/poverty reduction focus (n=26). The initial gender focus was higher in round 5/6 than 7/8 (88% compared to 44%). Note that the majority of respondents of 7/8 skipped this question.

Gender focus: In the original concept note 44% of the Partners had a gender focus, this increased slightly to 55% at the grant agreement stage in Round 7 and 8. In Round 5 and 6, already 88% had a gender focus in the original concept note and all partners have a gender focus in their final product, service or solution.

Development/poverty reduction/equality focus: It is noteworthy that 100% of the partners had a development/poverty reduction/equality focus already.in the original concept note in Round

7 and 8. In Round 5 and 6, all but one Partner had this focus in the original concept note, but in the final product all Partners have a focus on development/poverty reduction.

Question: Did the NCF requirement to contribute to sustainable development and the reduction of poverty influence your project/service/solution?

Only 22% (n=2) of the NCF partners in Round 7 and 8 in developing countries say that the NCF requirement to contribute to sustainable development and the reduction of poverty had an influence on their project, service or solution whereas all NCF Partners (100%, n=5) in developing countries in Round 5 and 6 say so.

Note that for 5/6 also Nordic partners answered this question.

Question: How have you found the NCF financial/accounting requirements?

Total: The majority of respondents finds the financial and accounting requirements about right (57%, n=14). The share was higher for 7/8 than for 5/6.

66% (n=6) of the NCF partner in developing countries in Round 7 and 8 find the NCF financial/accounting requirements are about right and 33% (n=3) find the requirements a little onerous.

In the previous rounds, 40% (n=2) of the NCF partner in developing countries found the financial and accounting requirements about right and 60% (n=3) found them a little or too onerous.

Question: Please tell us if any of the following are true. Please select all that apply.

In Round 7 and 8, for the majority of NCF partners in developing countries the Nordic partner was already known to them or they approached their Nordic Partner to apply for funding. One third of the NCF partners in developing countries in Round 7 and 8 had previously worked with their Nordic partner.

In Round 5 and 6 all NCF partners in developing countries approached their Nordic Partner to apply for funding.

Question: On the whole, would you describe the NCF criterion to have a Nordic lead partner as...

The majority of respondents find the NCF criterion to have a Nordic lead as partner as neutral (not positive, not negative) (54%; n=7)

55% (n=5) of the NCF partners in Round 7 and 8 in developing countries describe the NCF criterion to have a Nordic lead partner as neutral (not positive, not negative). 22% (n=2) find the criterion to have a Nordic lead partner to be an enabler, and the remaining 22% (n=2) find this criterion to be a barrier.

In the previous Round 5 and 6, 80% of the NCF Partner (n=4) find the criterion to be an enabler, the remaining 20%(n=2) find the criterion neutral.

Question: How did you first hear about the NCF challenge fund?

NCF partners in Nordic region most often first heard about the NCF challenge fund through word of mouth (35%, n=6), followed by Road Shows (18%, n=3) and Web searches and Networking Events (each 12%, n=2 respectively). NCF partners in developing countries most often first

heard about the NCF challenge fund from their local/Nordic partner (44%, n=4), followed by NCF website (22%, n=2).

This question was only included in Round 7 and 8.

Question: Thinking about the NCF marketing, application and selection process, to what extent to you agree with the following statements. Please select N/A if the answers are not relevant.

Overall, the NCF partners where quite satisfied with the NCF marketing, application and selection process. Only one NCF partner in a developing country was not satisfied with the selection process.

The funding round was well-marketed: 69% (n=18) strongly agree or agree.

The eligibility criteria were clear: 96.2% (n=25) strongly agree or agree.

Sufficient support from NCF was received with the entire application process: 100% (n=26) strongly agree or agree.

The applications were processed in a timely way: 80.8% (n=21) strongly agree or agree.

The selection process was clear: 96.2% (n=25) strongly agree or agree.

Sufficient feedback from NCF was provided throughout the entire process: 100% (n=26) strongly agree or agree.

The due diligence process was sufficiently thorough: 96.2% (n=25) strongly agree or agree.

The due diligence process was not overly onerous: 80.8% (n=21) strongly agree or agree

Note that this question was only included in Round 7 and 8.

Question: Please tell us why you applied to NCF at this particular time? (only asked to round 7/8)

Several Partners mention that the theme of the NCF fitted with their own project. Furthermore, a couple of partners report that they needed the funding to roll out our product in a new market.

Question: Please tell us if the marketing, application and selection processes could be improved in any way? (only asked to round 7/8)In general, the partners seem to be satisfied with the process. Two partners mention that the budget layout and the portal could be simplified. Furthermore, two partners mention that they had problems with the text limit.

Question: In your experience so far in working with NCF, to what extent do you agree with the following?

NCF is a flexible financing instrument that adapts to our needs and circumstances: 84% (n=21) strongly agree or agree in Round 7 and 8. This was lower in round 5 and 6 (64,7%, n=11).

NCF oversees and manages the implementation of projects effectively: 68% (n=17) strongly agree or agree in Round 7 and 8. This was lower in round 5 and 6 (53%, n=9).

NCF adds value to projects in terms of knowledge/advice/project management: 56% (n=14) strongly agree or agree in Round 7 and 8. This was lower for round 5 and 6 (47%, n=8).

NCF collaborates and works effectively with partners: 72% (n=18) strongly agree or agree in Round 7 and 8. This was 70.6% (n=12) in round 5 and 6.

NCF understands and manages risks well: 72% (n=18) strongly agree or agree in Round 7 and 8. This was lower in round 5 and 6 (53%, n=9).

NCF has effective monitoring and evaluation processes: 40% (n=10) strongly agree or agree in Round 7 and 8. This was lower for round 5 and 6 (41.2%, n=7).

Overall, the NCF partners in Round 7 and 8 agree that NCF is a flexible financing instrument, is managed effectively and shows effective collaborations. One Nordic NCF partner in Round 7 and 8 strongly disagrees that NCF adds value to projects in terms of knowledge/advice and project management. However, the other Nordic Partner in this Round either strongly agree or agree (66%, n =10), have no specific opinion or don't know (each 13% respectively, n=2). All NCF partners in developing countries in Round 7 and 8 agree that NCF adds value to projects. Furthermore, one Nordic NCF partner in Round 7 and 8 disagrees that NCF has effective monitoring and evaluation processes. The other partners in this Round, however, (strongly) agree with NCF's effective monitoring and evaluation processes or don't know.

The feedback on these questions has been a bit more negative in Round 5 and 6, especially from the Nordic Partners compared to Round 7 and 8. 3 (=25%) Nordic Partner disagree or strongly disagree that NCF collaborates and works effectively with partners. The partners in developing countries, do however agree or strongly agree. The Partner in developing countries in Round 5 and 6 are satisfied with the management of the implementation of the projects, but again 4 (=33%) Nordic Partner strongly disagree or disagree that NCF oversees and manages the implementation of projects effectively. 60% (n=3) of the Partner in developing countries in that round strongly agree that NCF adds value to projects, and 42% (n=5) of the Nordic Partner agree that NCF adds value. However, there are 3 (=25%) Nordic Partner that strongly disagree or disagree to this statement. All Partners in developing countries in Round 5 and 6 agree or strongly agree that NCF is a flexible funder. Half of the Nordic Partners (50%, n =6) do also agree or strongly agree to this statement, but 33% of the Nordic Partners (n=4) do (strongly) disagree to this. The feedback on the statement "NCF understands and manages risks well" has been again (very) positive for the NCF Partners in developing countries, but again two Nordic Partners do (strongly) disagree with that statement. 60% (n=3) of the NCF Partner in developing countries strongly agree that NCF has effective monitoring and evaluation processes and 20% (n=1) agree. On the contrast, only 25% (n=3) of the Nordic NCF Partner agree with the effectiveness of the M&E processes and 33% (n=4) (strongly) disagree.

Question: How satisfied are you with the following aspects of the NCF financing?

The amount of funding received: 76% (n=19) strongly agree or agree in Round 7 and 8. This was lower in round 5 and 6 (64,7%, n=11).

The method and speed of disbursement: 56% (n=14) strongly agree or agree in Round 7 and 8. This was lower in round 5 and 6 (35,3%, n=6).

The use of advance payments: 68% (n=17) strongly agree or agree in Round 7 and 8. This was lower in round 5 and 6 (17,6%, n=3).

The flexibility in how money can be spent: 60% (n=15) strongly agree or agree in Round 7 and 8. This was lower in round 5 and 6 (47,1%, n=8).

In general, in Round 7 and 8, the NCF partners are satisfied with the amount of funding they receive and the use of advance payments. Two NCF partners (one Nordic, one in a developing country) are however, not at all satisfied with the method and speed of disbursement.

Furthermore, one Nordic partner is not at all satisfied with the flexibility in how money can be spent.

In Round 5 and 6, the feedback about the amount of funding received has been more mixed, but most of the Partner were satisfied with the amount as well. The method and speed of disbursement was satisfying for all NCF partners in developing countries in Round 5 and 6, but more than 50% (n=7) of the Nordic Partners in that round were not satisfied with it. 80% (n=4) of the NCF partners in developing countries are satisfied with the flexibility in how money can be spent, the feedback is again more mixed for the Nordic region.

Question: Please use the space below to provide any further explanation (this question was only asked to round 7/8).

Two Partner stress that the possibility of advance payment is a significant advantage which is not commonly seen in many programmes. In terms of flexibility, there is a suggestion that if not all resources are spent for one post, it should be possible to spend them on posts where there were higher expenses than planned. This would allow competitive sourcing. In addition, there is a suggestion that some decision-making power should be given to Nordic lead partner to reduce the bureaucratic burden to always asked for consent even for small issues.

Question: Have you ever applied to a challenge fund in the past, for this or another initiative?

Total: 58.5% of the respondents have applied to a challenge fund in the past (n=24).

The majority of Nordic Partners in Round 7 and 8 (80%, n=12) have applied to a challenge fund in the past whereas only 44% (n=4) of the partners in developing countries in Round 7 and 8 have applied to challenge fund in the past.

Half of the Nordic Partners in Round 5 and 6 has previously applied to a challenge fund, the other half has not done so. Furthermore, 40% of the NCF Partners in developing countries in Round 5 and 6 has previously applied to a challenge fund,

Question: Have you applied unsuccessfully for finance for this product/service/solution prior to your NCF application?

Total: 20% of the respondents had applied unsuccessfully for finance for this product/service/solution prior to the NCF application (n=8).

33% (n=3) of the Partners in developing countries have applied unsuccessfully for finance for their product, service or solution prior to their NCF application in Round 7 and 8, whereas only 14% (n=2) of the Nordic Partners have applied unsuccessfully for finance.

In Round 5 & 6 none of the NCF Partners in developing countries has applied unsuccessfully for finance for this products/service/solution prior to the NCF application and only 25% (n=3) of the Nordic Partners have done so.

Question: If you hadn't received this NCF grant, how likely is it that the initiative would have gone ahead without NCF financing?

Total: 48.8% of the respondents said it was somewhat likely and 43.9% said it was not at all likely that the initiative would have gone ahead without NCF financing.

Only one Nordic Partner and two Partners in developing countries in Round 7 and 8 say that it is likely that the initiative would have gone ahead without NCF financing. The majority, however, states that this would have been only somewhat likely (40% of the Partners in the Nordic region

(n=6) and 44% of the partners in developing countries (n=4)) or not at all likely (53% of Nordic Partner (n=8) and 33% of Partners in developing countries (n=3)).

The responses in Round 5 and 6 show a similar answer pattern.

Question: Before receiving the NCF grant what other options did you have to finance your product/service/solution?

Total: The majority of respondents said that other donor grant-based financing was an option.

Commercial banks: 29,17% in round 7 and 8 said this was an option. This was only 5.9% in round 5 and 6.

Own finance: 62,50% in round 7 and 8 said this was an option. This was only 11,76% in round 5 and 6.

Other concessional/social impact financier: 54,17% in round 7 and 8 said this was an option. This was only 35,29% in round 5 and 6**.**

Other donor grant-based financing: 62,50% in round 7 and 8 said this was an option. This was 64,71% in round 5 and 6.

Other equity investor: 62,50% in round 7 and 8 said this was an option. This was only 5,88% in round 5 and 6.

For 27% (n=4) of the Nordic Partners and 38% (n=3) of the Partners in developing countries commercial banks where an option to finance their products, services or solutions in Round 7 and 8. In the previous rounds, this was not an option for any Nordic Partner and only for one Partner in a developing country. For 73% (n=11) of the Nordic Partners own finance was an option to finance their projects in Round 7 and 8 and only for 20% (n=2) of Nordic Partners in the previous Rounds. For 50% (n=4) of the Partners in developing countries own finance was an option in Round 7 and 8, but for none in the earlier rounds.

83% (n=5) of the Partners in developing countries and 62% (n=8) of the Nordic Partners state that other concessional or social impact financier were an option to finance their projects before receiving the NCF grant in Round 7 and 8, but only 60% (n=3) of NCF Partner in developing countries and 30% (n=3) of the Nordic Partners state this in Round 5 and 6.

Furthermore, 75% (n=6) of the Partners in developing countries considered other donor grant-based financing as a finance source. Other equity investors were only considered as a source of finance by 53% (n=8) of the Nordic Partners and 43% (n=3) of the Partners in developing countries in Round 6 and 7, and by none Nordic Partner and only by 20% (n=1) of the partners in developing countries in the previous rounds.

Question: With regard to the NCF challenge fund, to what extent do you agree with the following statements. The challenge fund...

...**Increases the likelihood of innovation/unconventional solutions to be tested:** 95.8% (n=23) strongly agree or agree in Round 7 and 8. This was lower in round 5 and 6 (88.2%, n=15).

...helps us to mitigate against financial risk: 95.8% (n=23) strongly agree or agree in Round 7 and 8. This was lower in round 5 and 6 (52.9%, n=9).

...increases the likelihood to reach commercial viability over and above other methods: 91.7% (n=22) strongly agree or agree in Round 7 and 8. This was lower in round 5 and 6 (52.9%, n=9).

...increases the opportunities for sharing skills and experience: 87.5% (n=21) strongly agree or agree in Round 7 and 8. This was slightly lower in round 5 and 6 (82.3%, n=14).

...incentivises local solutions to local problems: 87.5% (21) strongly agree or agree in Round 7 and 8. This was the same in round 5 and 6 (88.2%, n=15).

...addresses challenges for which commercially viable solutions are not currently available: 95.8% (n=23) strongly agree or agree in Round 7 and 8. This was lower in round 5 and 6 (58,8%, n=10).

...addresses challenges which businesses are reluctant to address due to perceived risk: 91.7% (n=22) strongly agree or agree in Round 7 and 8. This was lower in round 5 and 6 (70,6%, n=12).

It is noteworthy that all Partners agree or strongly agree that the NCF challenge funds increase the likelihood of innovation, except of one Partner in Round 5 and 6. Furthermore, all NCF Partner in Round 7 and 8 agree or (strongly) agree that the challenge fund helps to mitigate against financial risk. In the previous rounds only 33% (n=4) of the Nordic Partners agree and the remaining ones either have a neutral opinion (33%, n=3), disagree (8%, n=1), strongly disagree (8%, n=1) or don't know (17%, n=2).

In addition, all Nordic Partners in Round 7 and 8 agree or strongly agree that the NCF challenge fund increases the opportunities for sharing skills and experience. From the Partners in developing countries in Round 7 and 8, 22% (n=2) do have a neutral opinion about this, the remaining Partners from developing countries agree or strongly agree as well (67%, n=6) or don't know (11%, n=1). This similar to the responses in previous rounds, where the majority of the partners (strongly) agree to this statement.

One Nordic Partner in Round 7 and 8 and one Partner in Round 5 and 6, disagrees that the NCF challenge fund incentivizes local solutions to local problems, the other Partners in all countries do (strongly) agree on this.

The majority of the partners in all countries and rounds agree that the NCF challenge fund addresses challenges for which commercially viable solutions are not currently available.

All partners agree that the NCF challenge fund addresses challenges which businesses are reluctant to address due to perceived risk in Round 7 and 8. In Round 5 and 6, one Nordic Partner disagrees and one NCF Partner in a developing country has a neutral opinion on this.

Question: Please use the space below to explain any of your answers (open question)

Question: What are current and future risks to your product/service/solution?

The most often mentioned current risks in Round 7 and 8 to the NCF partners projects are a lack of customer demand or willingness to pay for the product, service or solution and the social, economic of political instability. 55% of all Partners mention these two as current risks.

In the previous round, the most often mentioned current risk for NCF Partner was the lack of continuation/follow-on funding as a current risk. 67% of the Partners mentioned it.

Question: What do envisage as your funding needs on completion of the project? Please select all that apply.

Total: the majority of respondents envisage equity investment as their funding need (51.2%, n=19), followed by non-repayable grant (43,2%) and loan (35,1%). The need for equity investment was higher in round 7 and 8.

After the completion of the project, most partners in Round 7 and 8 envisage equity investment as their funding needs (92% of the Nordic Partners (n=12) and 63% of the Partners in developing countries (n=5)).

In the previous round, most partners envisage non-repayable grants as their funding needs on completion of the project (64%, n=7 of Nordic Partner, and 60%, n=3 of partners in developing countries).

Den nordiska utvecklingsfonden (NDF) investerar i klimatbistånd i många av Sveriges partnerländer. Den här rapporten undersöker om NDF använder sig av rätt mekanismer för att ge fonden ett mervärde i global klimatfinansiering.

The Nordic Development Fund (NDF) invests in climate assistance in many of Sweden's partner countries. This report investigates whether NDF uses the right mechanisms to invest in the type of projects that will enable the Fund to create added value in the global climate financing context.

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