

**Mid-Term Review Report of Naturvernforbundet's
EmPOWERing Communities Program (2017-2020)**

November, 2018

TABLE OF CONTENTS

TABLE OF CONTENTS.....	2
ACRONYMS AND ABBREVIATIONS.....	3
1. EXECUTIVE SUMMARY.....	4
2. INTRODUCTION.....	6
2.1 PURPOSE AND SCOPE OF THE REVIEW.....	8
2.2 KEY REVIEW QUESTIONS.....	8
3. THE REVIEW TEAM AND METHODOLOGY.....	9
3.1 DATA COLLECTION STRATEGY.....	11
3.2 DATA COLLECTION INSTRUMENTS.....	12
4. FINDINGS.....	13
4.1 CHARACTERIZATION OF THE FIELD OF STUDY.....	13
4.2 WHAT THE REVIEW TEAM OBSERVED.....	15
5. KEY QUESTIONS.....	16
5.1 WHAT IS THE IMPACT OF THE SOLAR KITS AND THE IMPROVED STOVES.....	16
5.1.1. SOCIO ECONOMIC AND HEALTH IMPACTS.....	17
5.2 SUGGESTIONS OF THE REVIEW TEAM ABOUT WHAT NEED TO BE CHANGED.....	20
5.3 EVIDENCES OF PARTNERS' REGULAR MONITORING DATA COMPARED TO THE REVIEW TEAM'S FINDINGS.....	22
5.4 CRITICAL ELEMENTS TO BE HIGHLIGHTED IN THE PARTNERS' MONITORING TO FACILITATE INCREASED FUTURE IMPACT.....	23
6. RECORD OF SOME INTERVIEWS.....	24
7. VERIFICATION OF THE HYPOTHESES.....	26
8. LIMITATIONS TO THE REVIEW.....	27
9. RECOMMENDATIONS.....	28
10. CONCLUSIONS.....	29
11. REFERENCES:.....	29
ANNEX I. CONTACT DETAILS FOR NATURVERNFORBUNDET'S COOPERATING ORGANIZATIONS IN AFRICA.....	30
ANNEX II. CONTACT DETAILS OF RELEVANT INFORMANTS.....	31
ANNEX III. CONTACT DETAILS OF VISITED AND INTERVIEWED STAKEHOLDERS.....	32
ANNEX IV. INTERVIEWS WITH IMPLEMENTING PARTNER INSTITUTIONS.....	34
ANNEX V. SIMPLIFIED OVERVIEW FOR TIERS OF ENERGY ACCESS FOR HOUSEHOLDS.....	42
ANNEX VI. THE REVIEW TEAM.....	43
ANNEX VII. TERMS OF REFERENCE.....	45

ACRONYMS AND ABBREVIATIONS

ADEL – Agência para o Desenvolvimento Local (Agency for Local Development)

CSO – Civil society Organization

ERA- Environmental Rights Action

IEA – International Energy Agency

GIZ - Germany International Cooperation

kWh/ day- kilowatt by day

LPG- Liquefied petroleum Gas

JVE - Jeunes Volontaires pour l'Environnement

ME- Ministry of Energy (Mozambique)

MIREME- Ministry of Mineral Resource and Energy

MTF- Mult-tier –framework

NNV - Naturvernforbundet

NGO – Non-Governmental Organization

NORAD – Norwegian Agency for Development Cooperation

SNV – Netherlands Development Organization

ToC - Theory of Change

ToR- Terms of reference

WEO – World Economic Outlook

WHO – World Health Organization

YVE- Young volunteers for the environment

1. EXECUTIVE SUMMARY

The basis for the mid-term review of the Naturvernforbundet's EmPOWERing Communities Program is the program implementation plan for 2017-2020, which is part of Naturvernforbundet's agreement with Norad (GLO-0634 QZA-16/0392). The mid-term review intended to assess the extent to which the households actually benefit from access to modern basic energy solutions in order to recommend ways to improve the programme implementation so that it can reach further results. In this context, the following specific objectives were defined: (i) to identify the level of community satisfaction regarding improved stove technology and solar lamps and (ii) to identify how solar lamps and improved stoves influence the way of life of the communities under study.

Geographical focus was on Mozambique, as it is the country with the biggest share of the funding. The study was conducted from April to September 2018, and involved all implementing partner organizations. For the field visits, the review process involved districts of Moamba, Magude and Manhiça in Mozambique. The criterion for the selection of families to be part of the review we used areas covered by implementing partners, access or not to the National electricity grid in order to allow us to assess how access, to the electricity from the national network impacts adherence to other solutions of Modern and clean energies, and the time when communities had access to modern and clean energy services where it was possible to assess the impact of the use of clean energies over time.

As methodology, the team decided to use semi-structured surveys, observations and interviews involving randomly selected households. Interviews, field visits were conducted based on the list of households that benefited from the improved stoves and solar kits, working in coordination with the implementing partners in Mozambique. Skype calls, exchange of emails and online interviews were done with the implementing partners from Togo and Nigeria. Thematic focus was on solar energy and improved stoves for charcoal and firewood in rural areas.

The results of the study show that the introduction of fixed improved stoves with chimney, as well as solar kits, has brought advantages such as reduction of the quantity of the firewood used during cooking and consequently also reducing the times women go to fetch firewood. Reduction of the cost to purchase of firewood and the expense of the constant and incomplete recharge of cell batteries. Women informed the review team that they lost cell phone batteries during charging process. Families have improved their food, clothing, houses, and purchase of children's school supplies through the result of savings in consumption of firewood and the elimination of the purchase of kerosene. Evidences collected during the field visits and the information from interviewed people confirm that there are people using the technology and reducing the quantity of wood as well as changing firewood collection routine. There is also a reduction on emission of smoke and beneficiaries report having less irritation on the eyes and also less respiratory diseases.

To achieve even greater impacts, the team review recommends (1) the simultaneous introduction of improved stoves and solar lanterns in the communities not yet covered by the grid electricity (2) the introduction of payment system via Mobile money using the predominant mobile provider which has a good network coverage in the community, and (3)

Develop a good and comprehensive communication strategy in order to improve communication between activists and families benefiting from solar lanterns and stoves to improve the community routine maintenance of the stove and the solar kits, as well as, improve flow of communication and relevant matters. (4) The review team also recommends to find few minutes every day in the main TV channel or radio to broadcast the relevant aspects of using improved stoves including dissemination of the technology; (5) Do a regular monitoring at the areas covered by the improved stoves and solar kits, in order to be sure that these are being used, and whenever necessary solve possible problems and doubts of the users; (6) Promote activities aiming to exchange experiences of activists within communities and countries to create more synergies. (7) There is a need to lobby and do advocacy to the high level; (8) Looking to the positive impacts and the motivation of beneficiaries in different visited communities, the review team recommends to extend the project for some more years; (9) Schedule a continuous capacity building; (10) Create incentives for the entrepreneurs and field activists to continue the business; (11) Capitalization of gains and (12) identify strategic partners and places to establish new selling points.

The study concludes that if it could be possible, NNV could support the Productive Use of Renewable Energy (For irrigation, for offices to extend operating hours, create value added-products, etc.) In general, there are many positive impacts observed in rural communities which are brought by the introduction of new technologies. On a long-term basis, results are likely to increase in case recommendations, monitoring of project activities, replication and expansion of the project is seriously considered.

2. INTRODUCTION

Worldwide, more than 4 million premature deaths are associated with air pollution (WHO, household air pollution and health, fact sheet n.292, February 2016 update): www.who.int/mediacentre/factsheets/fs292/en/). About 2.5 billion people worldwide do not have access to clean cooking energy (Clean cooking Solution), among them 850 million people are in the sub-Saharan Africa (WEO- EIA energy Outlook 2017). One of the continents where energy access is still lacking for many is Africa.

Access to modern energy services is an essential pre-requisite for human development. Without energy, it is challenging, if not impossible, to promote economic growth, overcome poverty and expand employment opportunities. This has been recognized by the international community, with the Sustainable Goal 7 on "access to affordable, reliable, sustainable and modern energy for all". Yet, worldwide, more than 1 billion of people still do not have access to electricity today.

According to the 2017 INE statistics, Mozambique is a country with 2500 Km coastal line and 801.590 square kilometres, a total population counting to 28.9 million people, in which more than 80% live in rural areas. The population is growing at 2,9% per annum and this has a strong influence on the basic indicators such as health, water, education and energy access. The energy access has significantly improved over the last 15 years but due to population increase this is not clearly visible.

The national grid, distributed by the national energy utility *Electricidade de Moçambique* (EDM), covers nearly 30% of country, of which 68% is urban coverage and only 5.7% is rural coverage. Over 4.2 Million households still do not have access to the grid. According to the Ministry of Mineral Resources and Energy (MIREME) last updates (2018), 26.2% Population have access to grid electricity and most of them live in urban areas and less than 1% of rural households have access to electricity. Rural communities face the largest challenges regarding energy access. It is also the type of communities where basic energy access¹ is the most realistic solution if we are to reach universal access to modern, reliable and affordable modern energy services by 2030. In line with the commitment to reach the Sustainable Energy for All (SE4ALL) targets, the Mozambican National Electrification Strategy (NES) projects that 50% of households will have access to the grid by 2030. Mozambique will still not have all population with access to electricity but only half of the population is projected to have access by 2030.

The review team sees to the rest of the population as a potential market for off-grid technologies. So far, a market characterized with low appetite to investors due to many reasons, among them, lack of clear guidelines and regulatory framework, situation which can be changed in case of approval of the draft of the policy and strategy for the development of new and renewable energies by MIREME; the high interest rates at local commercial banks; investment risks; weak coverage of bank infrastructures in the rural. As alternative people use mobile money. Mobile money could be an alternative for the "Pay as You Go" solutions. But,

¹ We define "basic energy access" as access to energy services (cooking, light, ICT) according to tier 1 to 3 in SE4All's multi-tier framework. See: Beyond Connections: Energy Access Redefined

although the mobile network coverage is considerably good, special in the last years where we find Movitel offering high coverage for the rural off grid areas, still the mobile money is still low, there are few mobile money agents in the rural.

The Mozambican Energy National Fund (FUNAE), entity responsible for rural electrification, has contributed to off-grid energy access with over 1,767 projects over the last 20 years. It is important to mention that in parallel, private sector in energy space is emerging, especially linked to solar energy. Unfortunately, it is still not clear how many people are covered with renewable energy forms.

According to the 2017 national statistical data, less than 5% of households have access to modern energy for cooking. The majority of people rely on biomass, traditional fuels such as charcoal, firewood, animal waste to meet its primary demand on energy for cooking. In Provincial capitals and large towns people use mainly charcoal (over 80%), and in rural areas depend on wood (over 95%). It is important to stress that the use of inefficient cook stoves increase consumption of biomass. Whilst most people collect wood for free in rural areas, the price of charcoal has been steadily increasing in recent years. For example, currently a large charcoal bag, weighing 70 kg costs approximately \$20 in Maputo, while in 2015 it was approximately \$15. The production of charcoal is one of the leading contributors to deforestation in Mozambique. According to information accessed at the Ministry of Land, Environment and Rural Development (MITADER), forest cover is reducing at alarming rates in Mozambique. Advances in clean and certified technologies, associated with funding, are crucial to reduce consumption of wood and charcoal, increasing income, gender equity and improving the quality and life expectancy of millions of people particularly in rural areas. Considering the benefits of the use of clean energy, several countries, including Mozambique, Togo and Nigeria have agreed to implement the Sustainable Development objective 7, which aims to ensure reliable, sustainable and affordable access to energy services for all. In Mozambique, several institutions from different fields, are committed to develop and disseminate the use of improved and clean stoves. These include government institutions and CSO like ADEL – Sofala, Kulima, Livangingo, AVSI foundation, among others, with support from international organizations such as GIZ, NORAD, and SNV.

The Norwegian NGO Naturvernforbundet is implementing the programme EmPOWERING communities in three African countries – Mozambique, Togo, and Nigeria – with funds from NORAD. In Mozambique, Naturvernforbundet cooperates with ADEL-Sofala, Kulima and Livangingo. In Togo, the partner organization is Jeunes Volontaires pour l'Environnement/ Young Volunteers for the Environment (JVE/ YVE). In Nigeria, it is Environmental Rights Action (ERA). The programme facilitates access to modern energy services for households done by promoting locally produced improved cook stoves and small solar electric systems for light and charging of phones. To ensure that the programme has the intended impact on target beneficiaries Naturvernforbundet is carrying out a mid-term review of the programme. The review includes a case study impact assessment of improved cook stoves. The review will be made publicly available in Norad's database.

The results of the review will be used to assess the impact of the program, presented in the program's development goal and associated indicators, in order to clarify indicators such as:

To which extent the users report less respiratory and eye problems; To find out to which extent the households actually benefit from access to modern basic energy solutions and to get suggestions for how to improve further results; To which extent the users report that they get more time for production/ leisure; To which extent the users report that they have easier access to electronic information.

This report is organized in 10 parts. Part one is the Executive summary, then the introduction which includes the purpose and key questions. The introduction also gives the political framework of the energy sector, the current situation of the renewable energy sector. The third part is the Methodology which describes the procedures and key issues done for the review of the impact of clean energy in the area of study. Part four brings the findings of the study, the results that address the impacts and facts observed during the study. In five we find the key questions related with the impact of the technology, the socio-economic aspects, suggestions about what need to be changed and Monitoring and Evaluation process. Six brings records of some interviews. Part seven is the verification of the hypothesis. Eight covers limitations of the interviews, then part nine brings the review team recommendations. The last part of the report brings conclusions.

2.1 PURPOSE AND SCOPE OF THE REVIEW

The objective of the review is to determine to what extent the households from the target areas actually benefit from access to modern basic energy solutions and to recommend how to improve the programme implementation to reach further results.

Thematic focus is on improved stoves for firewood in rural areas. Rural communities face the largest challenges regarding energy access. It is also the type of communities where basic energy access² is the most realistic solution if we are to reach universal access to modern, reliable and affordable modern energy services within 2030.

2.2 KEY REVIEW QUESTIONS

- What is the impact for the users with reference to the impact indicators?
- What should be changed in the implementation to improve the impact?
- With reference to the impact indicators, how are the partners' regular monitoring data compared to the review team's findings?
- Which critical elements should be highlighted in the partners' monitoring to facilitate increased future impact?

² We define "basic energy access" as access to energy services (cooking, light, ICT) according to tier 1 to 3 in SE4All's multi-tier framework. See: [Beyond Connections: Energy Access Redefined](#)

3. THE REVIEW TEAM AND METHODOLOGY

The review team was comprised by four people. Three women and a man: Gilda Monjane, Zaina Mamade, Inocêncio Gujamo and Nina Blid. It had a woman and energy entrepreneur, named Gilda Monjane, as a team leader. This helped to bring the gender sensitiveness in the review process as well as ideas for economic empowerment linked to business with renewable energy for the rural off grid areas. Gilda's energy experience added a value in the review process. As a team leader had a task to coordinate all the review actions with all the team members. Guided team and community discussions, brainstorming, debates to stimulates solutions and encourage all community members to speak. Under the coordination of the team leader it was possible to design the review data collection tools, schedule field visits, plan and conduct interviews. Gilda was responsible in compiling the review report and insert comments and adding suggestions from implementing partners and review team members. Gilda had opportunity to interact directly with implementing partners from the different countries and collect information and additional comments after presentation of the preliminary report in Nairobi.

Zaina Momade, Forestry engineer, used her experience on data analyzing and processing to categorize main benefits of the energy project in order to highlight the impacts. As Forestry Engineer, she contributed with environmental and technical knowledge on forest to help evaluate the impact on the people and on the environment. She also helped in the design of the methodology, helped to make the bibliographic review especially of the existing policies on the improved cook stoves, on the profiles of the districts covered by the project, helped in the harmonization of the questionnaire, participated in the Data collection in the community, made the compilation, and contributed to the description of the results and recommendations, made some photos during the field visit.

Inocêncio Gujamo, graduated in Applied physics offered the review process his experience to assess how communities are handling the solar systems in order to have a better performance and last longer. He contributed in drafting data collection tools in coordination with the review team. Gujamo participated in field visits and also interviewed partners organization. He drafted the first version of the report closely with Zaina to be improved by all review team. Gujamo helped to do the analysis and he included the missing information, He helped with comments to improve the final draft of the report.

Nina Blid provided methodological back-up support to the study in particular with respect to elaboration of the inception report, and review of the first and second draft reports.

The ToR designed for the review suggested a qualitative study and the review team selected areas that represent different types of situations in order to bring a clear picture of the situation under review. For the mid-term review process, two separate but related studies were carried out: first a pre- and then a post-intervention impact study. The first study was to examine the Theory of Change (ToC) and the second study was to evaluate the implementation of the project.

THE METHODOLOGY

Following the Terms of Reference, the team decided to use as the methodology, semi-structured surveys and interviews involving randomly selected households. Interviews were conducted based on the list of households that benefited from the improved stoves and solar kits, working in coordination with NNV partner organizations like Kulima, ADEL Sofala and Livaningo. At times, the review team interviewed households that are not yet beneficiaries in order to find out about their interest and also use them to compare the different situations. In addition, meetings were held with different focus groups in order to deepen the understanding of the satisfaction and advantages of clean energy technologies in the different districts.

The first step taken by the team was the document Review and Analysis which ended up with the submission of the inception report. Under this process the team, based on the ToR, planned the way in which the study would take place, the methodology to be used, the geographic selection, designed the data collection tools, decided about sampling and coordinated with implementing partner organizations about the areas to be visited, the days and the field staff to guide the review team.

The review team decided about the time required for the Data collection and the methods having in mind the pre/post intervention impact study, and the information to collect for the Mid-term review. For the pre-intervention impact study, the team decided to allocate four days for the field interviews and later other three days for the post impact study.

As communities to be studied, the team decided to select one community that is rural and off grid and one which is peri-urban and partly on grid. The interviews were carried out during one day in each community. A total of four days in the pre-intervention phase, and three days during the post-intervention phase. The review team choose communities where either KULIMA or LIVANINGO implement activities based on convenience.

As on grid selected communities, the review team selected Moamba, Manhiça, the partly off grid was 3 de Fevereiro and the off grid community was Mapulanguene situated 130 Km away from Magude District. The selection of the field of study was done to fulfil the ToR recommendation.

As Interviews methods and characterization of the interviewees it is important to share that the team decided to use semi-structured interviews for local leaders in different places, semi-structured interview and observation for Individual community members, we also observed people cooking and the team used focus group and separated interviews for men and women in some areas. Under the findings the report is going to share the collected information during interviews and observations. Information was collected having in mind the key questions and other relevant issues discussed in the inception report.

The mid-term review was based on both desk review and field interviews. During part of the desk review, the review team worked to analyze project related documents from KULIMA, LIVANINGO, and ADEL-SOFALA as well as reports and the Monitoring and review documents and tools.

The interviews were done in two phases, namely during preparation of the inception report in order to help collect background and relevant information for the inception report, get suggestion about the areas of field study, find out about each field study support team to guide the team and understand more about the project. The meeting with the local partner institutions helped the review team to decide about the data collection, the intervention approach and also to design the field interview guides for the mid-term review.

After the first field visits, interviews with local partner's coordinators were done in order to get missing information from the field staff during field work. Then the post study visits were also scheduled in coordination with partner organizations.

The team selected different sampling techniques to apply for different data collection instrument. For some data collection tools, the team used random and stratified random sampling. For most tools, as the target population beneficiaries of the project are known a kind of judgement sampling was selected in order to allow to get relevant information from that specific target group. The team was conscious that sampling errors were likely to occur but to help minimize the errors purposeful sampling for the selection of the key informants, among all informants, was used for other tools in order to help rectify the errors.

It was discussed about sample size with the partner organizations and it was indicated that it is not relevant to bring a sample size statistically acceptable and correct. the review team worked in coordination with Naturvernforbundet and the implementing partner organizations to identify a limited number of communities for the review.

The review team visited the partner organizations Kulima, Livaningo in order to get useful information for the field visits. During the discussion Kulima and Livaningo indicated some communities that presently have introduced simple, locally made improved cook stoves with chimney and other mobiles stoves. They also indicated some communities in which they were in the process of starting production later in 2018. The selected communities some were with and without connection to the national electricity grid. This allowed to look at whether there were differences related to cooking habits and to see effects of promotion of solar lanterns in the off-grid communities.

3.1 DATA COLLECTION STRATEGY

The information was collected from the following respondents: personnel from local partner organizations, local community leaders and opinion shapers, local community members in the program areas (men and women separately) and relevant government officials. The review was more qualitative, but with some quantitative aspects. Descriptive, observations, measurable research were also carried out for each target group.

In this report, data is primary processed having in mind the key questions presented in the Terms of Reference. There was, a need to have in mind a secondary information available in the report of the Global Coalition for Clean Cookstoves and of the World Health Organization reports provided by KULIMA, ADEL-Sofala, JVE, ERA, Livaningo among other stakeholders, as

well as data on the profile of the districts under review. The information of the Global Coalition for Clean Cookstoves and the World Health Organization, although not reflected explicitly in this report, helped the review team to have internationally accepted concepts for improved stoves and to understand the International level the health challenges of rural communities that can be compared to Mozambican reality.

It served as the basis for improving the questionnaire, and to better understand technical aspects about improved stoves and the impact they have. The review of the access to modern energy services was also done on the basis of the Multi-tier Framework (MTF), developed by the World Bank Energy Sector Assistance Program, as it can be seen in the annex 7, and which is operationalized by Naturvernforbundet.

The primary population for the mid-term review consists of the beneficiary target group. According to the consulted documents and the mid-term review team understanding, the target group is comprised by a mixture of people on different levels of project implementation at different stages in their implementation cycle. The Scope and Focus of the TOR called attention for the review team to focus on the assessment of the target group using improved stoves and solar lamps. The review team used sampling from project implementers that can provide evidence of sustainable impact of the projects. The sample used contains an adequate and acceptable number of mature and well gender balanced representative target group.

3.2 DATA COLLECTION INSTRUMENTS

The mid-term review team developed data collecting instruments to guide and facilitate the collection of relevant information from various sets of respondents during field visits and visit to partner organizations. The instruments included:

- Various in-depth interview schedules that were driven by the information anticipated from the key stakeholders to be interviewed. As mentioned above those proposed interviewees included
 - Key program staff
 - Project Beneficiaries
 - Community leaders and opinion shapers
- Focus group discussion guidelines
 - The review process had a gender sensitive approach. Wherever relevant, both men and women were able to present their views to the mid-term review team and this helped the review team to capture and present gender specific data and information in this report;
 - The review team made sure that the methods applied are gender-sensitive in order to ensure inclusive, respectful and participatory approaches, methods and tools that help to capture gender equality issues. A gender-sensitive approach further included compilation and analyses of data that have women and other marginalised groups as

well as ensure gender related and disaggregated data (e.g. age, sex, origin of target respondents etc.).

- The review team produced an observation checklist to use during the field visits;
- The review team used the ToR to set up into the format of actual interview guides as well as to tailor the semi-structured interview guides, the refined questions for all the different stakeholder groups.

4. FINDINGS

The findings are result of two field visits the pre and post study and interviews with partners, questionnaires and the skype calls. The pre-study was done in April 2018 and the post study in September. The review team visited communities which had not yet been included in the programme to observe their living conditions, type of kitchen they had, get familiarized with their daily life and the expenses they had associated with cooking, the routine related with firewood collection, find out about possible problems. It is important to share that during the first visit all households did not have any kind of improved stove. In addition, 10% of the visited people had a safe kitchen and 90% households visited were cooking in open space.

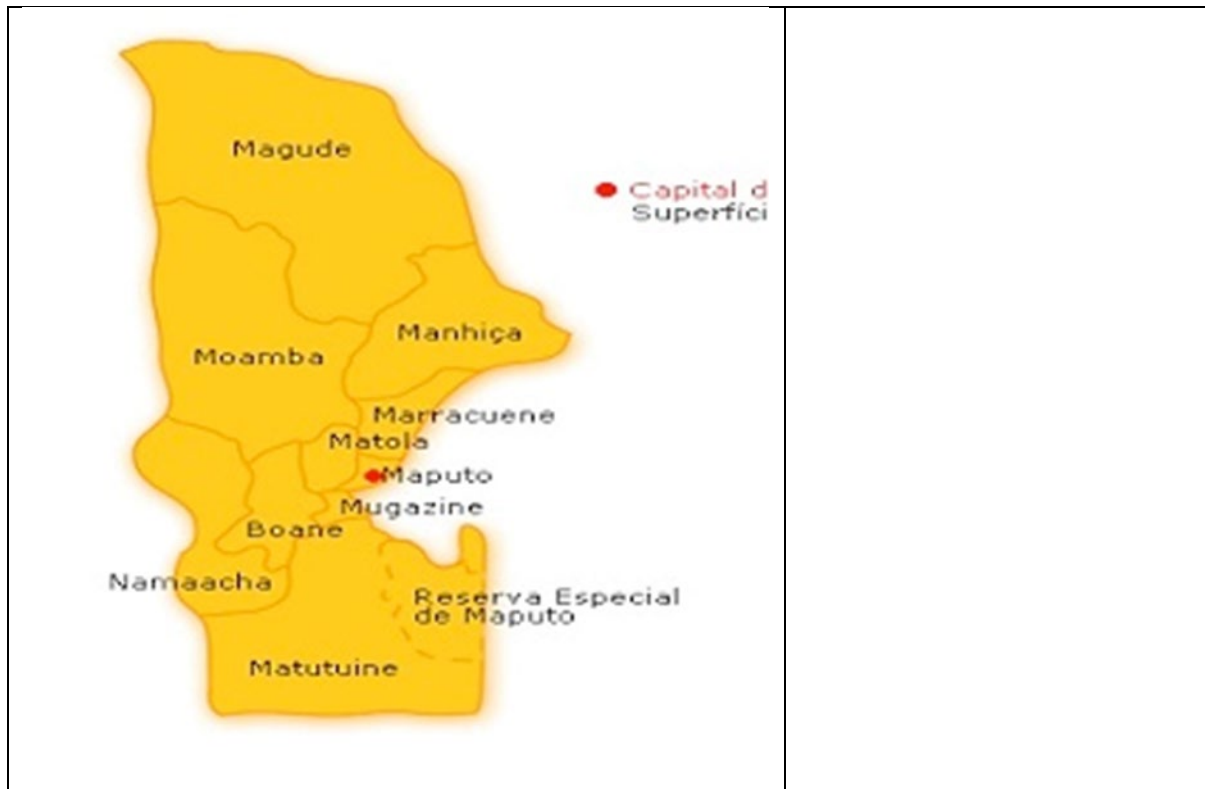
In September the review team carried out the post study and visited the same communities visited during pre-study in April. We found out that the implementing partners had started their activities in the new communities. The review team asked the visited households to compare the situation before and after the introduction of the improved stoves in the community. All interviewed households reported to be experiencing a good time as they were saving firewood and money. In terms of wood collection, the review team was informed that women now fetch fire wood only once in every three to four weeks compared to once a week before.

Data analyses and Information collected assisted the review team to pay attention to aspects which can help to bring answers for the key questions. Before bringing the details in terms of data collected, the team will offer a description of the different field of study visited. The review process offered an opportunity to stay closer to real life situation of poverty in general and energy poverty, in particular. During the field visits the team came across many positive stories linked to solutions brought by the introduction of solar energy and improved stoves in the communities by the Naturvernforbundet's EmPOWERing Communities Program.

4.1 CHARACTERIZATION OF THE FIELD OF STUDY

The mid-term review team decided to take advantage of having majority of implementing partners, including government decision making institutions, donor, CSO situated in the

capital, in south of Mozambique and studied intensively the south of Mozambique. Knowing the influence that Sofala has because of the Sofala corridor which leads to interior countries like Zambia, Zimbabwe, Malawi. Apart from that, Sofala province is the place where we find another implementing partner, ADEL Sofala, because of that the review team did its best to bring data from Sofala province. The geographic map below illustrates the location of the studied districts from the South of Mozambique.



The first community visited was Moamba District. Moamba is located in Maputo Province, about 75 km away from the capital city. Moamba is a District connected to the electricity grid but it is only the headquarter of the district. 10 Km away from the district there is no grid connection and houses are spread apart.



According to the Moamba District Profile 2014, the natural forest potential is becoming insufficient to meet the growing need of the region, exacerbated by the intensive use of firewood and production of charcoal to meet district needs and to supply Matola and Maputo cities.

Picture 1 – Moamba Railway Station

In Magude, the review team also visited Mapulanguene. The main purpose of visiting Mapulanguene was to visit the households that are beneficiaries of the solar kits' projects. Mapulanguene is a place not yet connected to the grid. The last connecting pool is located nearly 100 kilometers away from Mapulanguene.

4.2 WHAT THE REVIEW TEAM OBSERVED

The review team observed many different things. In this report we will try to bring observations relevant for the study. The first and remarkable observation was a lot of South African influence in the culture of Moamba and Magude improved stoves beneficiaries. After living some years in South Africa, the beneficiaries carry back home (to Mozambique) living habits not typical for rural communities. They have experienced life with energy and when traveling back to Mozambique they do not have energy. Once they are offered alternative with the solar kits, we observed that they are prepared to buy and use. In some households we observed that they brought back to Mozambique solar kits that they are using or its partly broken, not in use anymore just being part of environmental litter.

For cooking, we observed that the majority of the households use firewood. We also observed that trees are an important source of energy, supplying firewood and raw material for the charcoal production. We have observed that it was also the main fuels for domestic use, being marketed locally for local households and also for neighbour cities. Maputo is one of the cities receiving firewood from many different origins.

The review team also noted that access to the National electricity network does not influence the consumption of firewood in the communities. Because even if it was possible to use the electric stove, the amount of the money to pay for an electricity invoice would be unbearable for low-income families. The penetration of the cooking gas is still reduced, so the firewood is still the main fuel option for food preparation and water heating in many households.

We observed the interest on the communities to shift from kerosene lamps to solar kits. We could see the willingness to pay not just to have the kits for free.

In terms of gender sensitiveness, the review team, followed a participatory approach method and used tools to help to capture gender equality issues. We gave time to both men and women to present their views and opinions. In addition, a gender-sensitive approach included compilation and analyses of data that have women and other marginalised groups as well as ensure collecting women voices during debates and meeting.

The review team was not happy because in some places it was not possible to meet the female activists listed as part of the field teams because of pregnancies and marriages. We were informed by field activists that some of the women energy activists were not allowed by their husbands to do the job after getting married.

We observed that cook stoves projects implementers include women in the trainings. Trained women help to do the maintenance of the improved stoves. We have also observed that the energy projects have women as the majority of the beneficiaries. May be this is linked with

the fact that in rural areas most women are the head of the aggregates, apart from being the responsible for cooking and for the firewood collection

5. KEY QUESTIONS

The purpose of the review, states that the rresults on the outcome level are straight forward to monitor the impact. So, the team worked having in mind that the review is to be used to assess the impact of the program, presented in the program’s development goal and associated indicators, as the table below illustrates:

Households benefit from new access to affordable, reliable, sustainable and modern energy solutions (SDG 7).	1. To which extent the users report less respiratory and eye problems
	2. To find out to which extent the households actually benefit from access to modern basic energy solutions and to get suggestions for how to improve further results.
	3. To which extent the users report that they get more time for production/ leisure
	4. To which extent the users report that they have easier access to electronic information
	5. To which extent the users report that they save money

5.1 WHAT IS THE IMPACT OF THE SOLAR KITS AND THE IMPROVED STOVES

In relation to the impacts, the review team concentrated efforts to collect and bring evidences on the impacts of the solar kits and the improved stoves on the users, the socio-economic benefits and the environmental gains. The review team noted that:

- There are households using improved lanterns and stoves as an alternative energy source for cooking and lighting;
- With the introduction of improved stoves, there is a reduction of the time for collecting firewood for cooking, giving advantages to people responsible for fire wood collection, mainly for women, girls and children;

- The use of simple mobile improved stoves helps to save wood resources and money. In addition, the use of fixed improved stoves with chimneys, apart from contributing to save firewood and money, it helps to reduce respiratory diseases caused by inhalation of smoke resulting of incomplete combustion of firewood and kerosene;
- The use of improved stoves and solar lamps offers users a possibility of carrying out other activities;
- Using improved stoves, helps to reduced cooking time;
- Households using solar lamps have economic gains because they save kerosene money;
- Households using solar lanterns have better light compared to households using candles and kerosene lamps;
- Households using improved stoves reduce costs with energy for cooking as they use less firewood than before. They do not buy wood in the same quantity, they buy less firewood;
- Improved stoves projects contribute for Job creation and self-employment;
- Women are more involved in energy products use and promoting.

5.1.1. SOCIO ECONOMIC AND HEALTH IMPACTS

The review team noted that the introduction of Solar kits and improved stoves brought to the target communities social and economic gains. Under social gains, we find solar lanterns contributing for people wellbeing, helping kids to do school homework during dark hours (A clear example of the difference of the solar light and the light of a candle can be seen in the link <http://www.youtube.com/watch?v=j0xf89OLDcc&sns=em>) and improving the education process and the health gains are brought with the elimination of the smoke inside the rooms and the cooking place and leading to elimination of the respiratory diseases.

The health centre has recorded few cases of respiratory and ocular diseases after the introduction of the new technologies. During interviews with the health workers at a health centre one nurse said that it is remarkable that the new energy technologies contribute to the reduction of diseases, although that it is difficult to distinguish the contribution of the improved stoves and solar lanterns to the reduction of respiratory and ocular diseases. Among the users themselves there is a lack of awareness of the impact of the new technologies. Health centre reported cases of Burn of children and destruction of houses due to the use of candles and traditional lamps. The kerosene would have been avoided if people would be using solar lanterns.

From the visited kitchen, it was evident that the largest emission of smoke in the air occur when people are using the traditional three stones stove. From the corrugate zincs it was possible to see the advantage of using improved stoves, since the ceiling of the zincs in the kitchens with chimney suffers less, as it gets less smoke, which improves the image and cooking environment in the kitchen. The Picture 2. illustrates how the kitchen zincs suffer from the emission of smoke.



Fig. 2 - Picture illustrating dark corrugated Zincs because of smoke

The interviewed women showed to have clear knowledge about the relevance of both solar kits and improved stoves. We noted that some women even knew how to do the regular repairs when the cook stoves starting getting cracks. The only problem we noted is the lack of clay in some communities.

We find evidences that women are using the solar kits and the improved stoves in almost all the visited houses. In 80% of the visited houses women were cooking during the time our team entered their houses and in other houses we could feel that the stoves were still very hot. In five visited houses people were at the same time using in parallel three stones stove because of family size, as they explained.

For the solar kits the review team interviewed both women and men. The interviewed head of households, reported that they are saving money when using solar lamps. People said that the money they save it is used for other domestic needs, to improve nutrition of the family aggregate. They also said that they use money to send children to school, buy clothes and improve housing conditions. Some houses used to be covered with grass but with the savings, houses are now covered with corrugated zincs. People are changing from the traditional house to modern ones. Students related that then they can do their homework and improve their school performance.

From the description, the mid-term review team, understood that beneficiaries use less wood or less money to buy it than before. Before the beneficiaries start to use the improved cook stoves they used to collect firewood every Friday. After they started to use improved stove they collect firewood one Friday to use the entire month. They use a single day in a month to collect firewood for the entire month. In general, interviewed households save 3 to 4 times the wood they collect or they buy when using improved stove in term of saving time.

The review team also noted that in the circumstances when households are buying the firewood there are evidences of saving the fire wood they use, consequently saving the money they spent buying firewood. Depending on the size of the family we noted that they spend from 30,00MTs to 200,00 MTs per day (1 USD = 60MT), official rate as of 20 September

2018), and 700,00MTs to 1200,00MTs per month for a normal bag of charcoal. Currently are using less than half (1/4) of firewood or charcoal by using improved stoves. These savings are significant for families whose monthly income is approximately 60USD.



Fig. 3 a) – Left: Amount of Firewood sold in Moamba and Right three stone stove, b) Clean pots when cooking in the improved stove c) Apart from using more firewood, pots get very dirty in the three stones cooking.

The image in a), taken in Moamba, during first field visit, illustrates firewood sold costing 150 Mt (2,5USD) for each amount of six woods and the amount of firewood that was used in a three-stones cooking. In the three stones cooking they used to use 12 firewood or more and pots were getting very dirty (dark). Now in the improved stove women use three to four woods and pots remain clean.



Fig. 4 – Fixed improved Cook Stove: On the left good example and on the right, rain water comes in and destroy the cook stove

From the description of the interviewed people, the mid-term review team noted that the majority of people who have the task of fetching firewood are women, girls and children. They spend 3 to 4 hours in the process. Girls informed the team that they sometimes miss school or go there late because of fetching water and firewood before going to school. Now that the number of the days of firewood collection reduced and girls are happy because they have opportunity to collect wood in a day that they do not go to school. With the use of the improved cook stoves, there is a saving of wood in the families and girls do not miss lessons anymore. Girls have enough time for schools and hopeful they can learn and in future have opportunity to perform a paid job than most of the interviewed women who are only working in a subsistence agriculture with no payment at all.

When the review team asked about the advantage of using the new technology, they easily listed the advantages that they are having as well as the gains they see when using the saved money with kerosene. The list which follows we captured from the villagers who are the beneficiaries of solar lamps and improved stoves during group debates:

In summary both groups of men and women using solar lamps, separated, said:

- ✚ We used to spend 10,00MT per day to charge our mobiles, but now we use or solar kits and we do not spent money to charge mobiles anymore;*
- ✚ We stopped walking long distances to charge mobiles. We can use time for other productive activities;*
- ✚ I do not know where I left my kerosene lamp because I stopped using it;*
- ✚ We stopped wasting money for kerosene and we use money for food and improve our house condition;*
- ✚ We are now free from kerosene and we do not feel the smell of it;*
- ✚ We now have more bright light;*
- ✚ We now work more safe in the dark;*
- ✚ We help our kids to do school homework;*
- ✚ We can also do our alphabetization homework during nights;*
- ✚ We don't know how much costs kerosene now because we do not use it anymore;*
- ✚ I do not need to worry because of wind when I am outside my house. The solar kit doesn't get off with wind;*

In the communities using improved cook stoves, apart from the description we reported, we also collected the following feedback from the users:

- I now use less firewood than before and this makes me save time and money;*
- My improved cook stove makes me cook in a clean kitchen;*
- I like to use the improved stoves with a chimney;*
- I only use 8 woods to make the stove hot and then remove and save the firewood;*
- We now face less problems to clean the pots. When using the improved stoves pots do not get dirty;*
- The cook stove remains hot for long time that I then do not need extra firewood or charcoal to warm water for us to have a bath. I put the kettle and then the water is warm;*
- I know the advantages of the improved cook stoves. I now spend time sharing the advantages with my neighbors to start using it in order to save as well;*
- I know how to repair the cook stoves and I now help other women;*

5.2 SUGGESTIONS OF THE REVIEW TEAM ABOUT WHAT NEED TO BE CHANGED

In terms of what need to be changed, the team, observed that in some large family household women continue using in parallel three stones cooking for the big pots. They informed the

review team that this is because of the family size which is big and force them to cook food in big quantities using big pots. The review team suggest that the field activists and technical staff need to consider the family size when building the stoves. If possible have different size stoves. Communication with the family can be a way to solve the problem.

The team visited households cooking in open space and noted that they are preparing themselves to build a kitchen properly covered in order to benefit from improved cook stoves project. It is important that such households are followed up and included in the programme, once they finish to build the new kitchen some stoves built in kitchen not appropriately protected from rain.

In parallel, we visited family aggregates that have the improved cook stoves built in kitchen which rains gets inside. Such stoves do not last longer due to the water from the rain that causes the clay to dissolve. The review team suggests the technical staff and activists to build the stoves in kitchen safe from the rain in order to protect the stoves and ensure sustainability of the projects and allow the expansion to new areas;

We observed that in some houses people do not have the habit to remove ash in the stoves. As a result, the ashes block the chimney and the smoke do not come out. The kitchen remains full of smoke and they then not see the advantage of using the cook stove with chimney. The review team suggest the field activists to do a continuous education, social visits and support to the beneficiaries.

People in the community wait long with money to meet Livaningo activists to pay. The review team suggest the opening of selling points to allow villagers to immediately buy the kits and avoid waiting long because money may be used for something different than solving energy problems or adopt to use mobiles banks.

We observed the process of replacing or changing some spare parts of the lamps after some months of use. The review team think that this should be avoided. May be a seal need to be fixed to avoid that the solar kit is opened by curious kids or adults in the family who end up breaking the material and compromise its sustainability nature.

When the review team visited Mapulanguene, we observed that the use of improved stoves did not start yet but during interviews we noted that the long distance and time spent in firewood collection is one of the preoccupations for local women. During the interviews, women showed concern on the different problems they face related with cooking energy. They wished to find alternatives to help them save firewood in order to allocate less time collecting firewood. As Mapulanguene is situated closer to the regional park, women also face the fear of wild animals and park guards during firewood collection process. Therefore, we recommend the introduction of improved stoves in Mapulanguene. A combination of improved stoves and solar kits can help to solve many community problems and alleviate women from heavy domestic work load.

We observed that the beneficiaries pay using cash when they receive Livaningo monitoring visits in the community. The review team suggest the use of mobile money transfer. Knowing that the area is covered by Movitel, e-mola could be the most advisable one.

We observed the meeting of Livaningo and the solar kits beneficiaries. We noted that people are allowed to change the solar kits after sometimes in the name of the guarantee that is found in the package. According to our experience in working with rural communities, villagers are very curious and always like to get a new kit. Most time damage to the supplied kit is done by the young kids in the family or curious adults. So, if the changing process is done with not much difficulties people will always request to change the old kit and this process may destroy the business. The review team suggest creation of clear guideline principles and procedures to help the business be more sustainable and efficient.

In Mapulanguene, Livaningo is currently promoting the use of solar kits but still with no fixed selling place. Because the interest on villagers is arising, we suggest that a permanent selling point could be established. Following the Head of the local Posto de Administrativo, we also suggest training youth and women from Mapulanguene. The review team looks to the problem as an opportunity for a gender integration in the process. We are sure that if more women are trained in terms of technical and business skills linked to renewable energy, Livaningo will be giving a chance to women to perform a decent and paid job apart from allowing more people to have access to clean, affordable and sustainable energy. As a result, we are going to have more women economically empowered and serving their community as change agents. Finally, this will be a contribution to accomplish or fulfill two important goals related to SDG 5 and SDG7, apart from many other related to end poverty, malnutrition.

In relation to the improved cook stoves the review team suggests the creation of a fixed place where the field activists can be met in case members of the community wish to meet them. In that place it could be possible to have clay to repair the cook stoves when they start having cracks or the cook areas became larger. So far, all field visited do not have an office or a fixed place. We observed that some visited communities they use the place where the community normal meet with the community leader, most of time under a tree to meet and discuss energy issues. As a tentative solution and an experience, Gilda decided to help the activists from Palmeira to build a small house where most of the documents and relevant information will be kept. The place is not yet ready because initially they listed material and they forgot to include some in the list. The review team failed to get a plain and organized information at the different visited fields because of lack of files and data in the hands of the field activists.

5.3 EVIDENCES OF PARTNERS' REGULAR MONITORING DATA COMPARED TO THE REVIEW TEAM'S FINDINGS

The review team observed that there are clear evidences of partners' regular monitoring of the activities. During monitoring visits partners had guiding tools to help collect relevant information. We noticed when we observed, that the technical staff do the monitoring of the activities in one community that it was difficult for him to use strictly the recommended guiding tool because it is too long and rural households is not always that they have time or can allow the interview to be finished.

Partners have different timing for the monitoring process. Some do very often and at various levels. The review team found out that JVE have team leaders who lead activities on the

ground and plan their monitoring activities monthly for over 3 months. Then the project coordination is tasked to monitor the programme activities on the ground as well as its implementation every three months in which a team meeting is held, and a field visit scheduled to the regional offices. After that a mid-year and end year review exercise is also undertaken between the coordination and management to review programme implementation, results and strategies.

Livaningo does Monitoring in Maputo every fifteen days (Two weekly) and for provincial levels it is done on a monthly base when funds are available otherwise it is done every three months in the times of reduced funds. Nevertheless, Livaningo has weekly contacts with the Focal Points.

The review team found out that Kulima has two kind of monitoring process: at provincial level and at the regional level. In total they do 16 sessions of Monitoring and Review for the Provincial level and two at the regional level (one each semester).

The partner organizations have created a data bank with the details of the beneficiaries of the solar kits and cook stoves. Maybe it is because of the existing information that the partner organizations see themselves as responsible of the broken solar kits. It is true that the existing list of confirmed names that are part of the beneficiaries it is one step to offer warranty. Additionally, as a way to be given warranty a good and correct use and other relevant steps need to be observed.

May be as a way of avoiding partners' responsibility on the broken material, partner organizations should in parallel appoint entrepreneurs in different communities to help to take care of the solar kits and improved stoves, to report timely about any defected material. The review team suggest that it could be the responsibility of such local entrepreneur to educate, pay regular visits to the different beneficiaries and satisfy the new beneficiaries. Such local entrepreneurs need to be in contact with the local partner institutions to report about the problems encountered in the community level.

5.4 CRITICAL ELEMENTS TO BE HIGHLIGHTED IN THE PARTNERS' MONITORING TO FACILITATE INCREASED FUTURE IMPACT

- ❖ Under the elements to be highlighted in order to increase future impacts, can be seen some already mentioned in 4.1 under the impacts indicators like the need to have trained entrepreneurs, selling points, flexible and fast payment mechanisms like e-mola in the communities closer to the beneficiaries;
- ❖ Additionally, the review team identified the need of additional funds for monitoring and review as another critical element.
- ❖ The field activists complain the fact of having less visits from Kulima and livaningo technical staff. We were informed at the respective offices that it is not always that they have available funds for the monitoring and review process;
- ❖ The review team suggest that the program should give more focus on comprehensive accompaniment of communities, on education and sensitization for Behavioural

change purposes coupled with the distribution of solutions. Right now, a focus is put on the distribution of equipment and construction of cook stoves.

- ❖ The review team suggests to produce more guiding materials and tools on data collection for monitoring of the activities and improve the documentation of impacts at the field;

It is true that some families do not buy firewood in the village, on the contrary they fetch it far away from their houses in places where they do agricultural work. They regularly bring firewood in small quantities whenever they return from the field. In these conditions we have noticed the saving of the wood translated in the reduction of the human efforts and trips to search of firewood. The gain from saving physical effort is quite significant since men and women as well as children work hard on the farm and deplete their body energy. Even though, we observed that they have an additional job of carrying wood over long distances.

Although the research team visually noted that smoke was channelled through the chimney out of the kitchen, it is difficult to distinguish to what extent the use of improved stoves reduces breathing and eye problems. Families are not fully aware of the origin of respiratory problems as well as ocular problems. Although they recognize that before using improved stoves, their eyes are tearing more, and coughs also appear more frequently. Health centres also have no records of respiratory or ocular problems caused by smoke inhalation. However, they theoretically recognize that the inhalation of smoke from burning wood can cause or contribute to lung and eye problems.

6. RECORD OF SOME INTERVIEWS

The review team recorded some interviews to be part of the report. During the interview with the head of the *Posto Administrativo* de Mapulanguene, in Magude District, Mr. Fernando Antonio Ngingi, we found out that energy was one of his concerns.

The government public office uses solar energy to meet its basic needs and Mr. Ngingi said “Likely enough we have solar energy... it helps us to meet the basic needs and we like to use it.” Additionally, he sadly commented with our team about the solar modules that were stolen at the water pumping place. He also said “I do not think electricity will reach Mapulanguene in a short time. This makes me sad because I have walked around, since I was appointed the head of this place, I talked with the people and I have noticed that one of their major concerns is electricity. Everyone is asking for energy.” The local school uses solar energy. In the local health center FUNAE installed large solar system but unfortunately it did not function even a week. Now the nurses and midwives uses cell phone lamps during nights to take care of sick patients and women giving birth.

According to Mr. Ngingi comments, he likes the intervention of Livaningo and he wished more local people could be trained to help solve as fast as possible any problem that may arise with supplied solar kits. The head of the district looks to the young people (Boys and girls) in the community as prominent entrepreneurs that can be trained and be used as energy entrepreneurs to solve the problem in the community.

After interviewing the Head of the Posto Administrativo we went to a place to meet villagers. In that place the review team had opportunity to talk with some people who are the beneficiary of Livaningo. We first put people in two groups: separated men and women. Then we talked to them jointly. We noticed that the responses were similar. Apart from Leonor Mundlovu that reported a problem with the phone charger in her solar kit and other two people that reported a problem with the kit itself the others were very happy with their solar kits.

The review team visited and interviewed successful entrepreneurs. In this review report, we selected three examples to share. We first had opportunity to talk with Elina from Sofala Province, Nhamatanda District, a Women Entrepreneur supported by ADEL Sofala. Elina sells improved stoves and solar kits. She started her energy business buying one solar kit. She used the kit to charge her neighborhood cellphones. At the beginning, she reported to charge at least 5 mobiles per day and earn 50,00MTs. She started saving money at the local saving group in her village. Later, she was allowed to buy 8 solar Kits and some cook stoves. So far, she sold more than 230 solar kits and more than 435 cook stoves. Elina uses mobile improved stove herself for cooking. She informed our team that she used to spend 30,00MTs to buy three quantities of firewood (1 place cost 10,00MTs), but after she started using the improved stove she only needs one portion costing 10. Elina is one of the key energy entrepreneurs in Sofala province. She participates in Government consultation meetings when the topic is to discuss barriers that entrepreneur face and or the process of finalizing the Renewable Energy Strategy.

The second entrepreneur interviewed was Percina living in Mukatine community, one of the off grid community of Maputo Province. Percina is an entrepreneur selling solar kits. Apart from being entrepreneur, Percina is the head of part of her community (Chefe do Quarteirao). She informed the review team that she likes the work she is doing. Initially, she has received a kit from Kulima and she was instructed to send the money via Mpesa. Then, as she is heading the community, showed ability to sell faster and sends complete money, Kulima found this as a good requisite to become selling person for her community. Kulima requested her to do the work, they explained about the percentage of money that she will get per each item she sells and Percina accepted. She gives the solar lanterns to people in her community and after sometime they are supposed to pay in instalments. The sad part of the business is when she is forced to chase the beneficiaries that take long to pay the kits, otherwise she is happy because she is helping people to have access to clean form of energy and also being able to charge mobiles. She informed our team that the beneficiary people in the community like to use the technology. She remembered that there was a set of solar kits, distributed in the community that had technical problems and the problem was almost felt by everyone in the community. According to Elina's comment, they were lucky that Kulima accepted to change the not working kits. Before Kulima's intervention in the community, they were using diesel generators, Lanterns with dry batteries, kerosene lamps and candles. Percina informed our team that candles and generators had often burned houses and killed people in the community. As closing remarks, she informed our team that solar kits are helping children to do school homework.

The third entrepreneur interviewed was Sara. She lives in Gohloza community in Maputo. Sara is the responsible of her community (Secretaria do Bairro), more than just a responsible of a single *Quarteirao*. Gohloza is community not yet connected to grid. Sara deals with many people performing the role similar of Percina's (She is a kind of Percina's boss). Sara reported to like the work she is doing. She informed the review team that she started the energy business buying three solar kits. Sara explained the review Team about the challenges that people living in the off grid communities are facing. She gave examples of involved risks of using candles and generators. Burning the houses was one of the risks apart from smelling smoke, kerosene and diesel inside house. She explained that in the last months there are many people wishing to purchase solar kits in her community but it is not always that she has material. For each kit she sells she gets 50,00 to 100,00MTs, depending on the size of the solar kit. She shared with our team that she has seen in pictures women repairing solar systems and she wished that the women from her community could be trained so that they will be able to do a job that they know what they are doing and get have details about it, so that they can help with minor repairs in case a solar system break.

In Mozambique, the Renewable Energy Policy is under revision. Some private sector implementers are testing new models like "Pay as You Go". The review team found one Private company that introduced "Pay as You Go" model in some areas selected for field visit. It is important to mention that the selected field are communities with difficult access and some with absolutely no mobile connectivity.

Mr. Cossa is one of the beneficiaries of the private company. He is forced to travel and spend 300 Meticaís, with the trip to go and pay 500 Meticaís for the system to be activated. He also spend some money to call people at the private company office based in Manhiça, to agree on time and a place to meet him in Magude to collect money. Apart from the money we noticed that there is also time constrain involved in the process because Mr. Cossa he must wait some hours in Magude District waiting for the Workers of that company who travel from Manhiça District to meet Mr. Cossa. As a comment to this problem, the review team suggest that before introducing "Pay as You Go" project implementer need to explore the best mobile connectivity in the area to use it for the regular payment. We will make sure these comments reach the team working on the revision of the Renewable Energy Strategy.

7. VERIFICATION OF THE HYPOTHESES

As preliminary hypotheses of the desk review the review team advance the following statements:

- There are households using improved lanterns and stoves as an alternative energy source for cooking and lighting;
- With the introduction of improved stoves, there is a reduction of the time for collecting firewood for cooking;

- The use of improved stoves with chimneys, helps to reduce respiratory diseases caused by inhalation of smoke resulting of incomplete combustion of firewood and kerosene;
- The use of improved stoves and solar lamps offers users a possibility of carrying out other activities;
- Using improved stoves, helps to reduced cooking time;
- Households using improved stoves reduce costs with energy for cooking;
- Improved stoves projects contribute for Job creation and self-employment.

The result of the review process confirms the advanced hypotheses during the inception phase. Evidences collected during the field visits and the information from interviewed people confirm that there are people using the technology and reducing the quantity of wood as well as changing firewood collection routine. According to the women interviewed, cooking in kitchen with chimney, it is more enjoyable as it does not cause pain in the eyes with smoke. The review team also interviewed women confirming to save wood when they cook in improved stoves. The women entrepreneurs selling solar kits have now created a way to generate income, with margin of selling solar kits, that can be considered a kind of job. The review team found out that the generated money helps to improve the family nutrition, living conditions, clothes and education of the children and other aspects.

8. LIMITATIONS TO THE REVIEW

The team was not able to visit the programme activities implemented by ADEL, ERA and JVE, but we have interacted intensively with the implementers. The review team believe that African communities are full of similarities and because of that some images seen in the visited fields could also be found in the rest of the countries.

During review process the Ministry of Mineral Resources and Energy (MIREME) organized a consultative meeting in Maputo to discuss energy policy and regulatory framework related to building capacity for entrepreneurs to actively promote and sell renewable energy and invited many organizations and entrepreneurs working with energy in their programmes. Among the participants of the meetings, the government invited Kulima, Livaningo, ADEL Sofala and entrepreneurs based in provincial level. The meeting gave the review team an opportunity to interview ADEL Sofala representatives and the energy entrepreneurs based in Sofala working in collaboration with ADEL. It is important to stress that the Sofala women entrepreneurs' group were taken as one of the best practices.

Finally, the fact that the review team could not travel to Sofala and other countries cannot be seen as a limitation for the present review process, as it was said in the inception report, because it was possible to get relevant information.

9. RECOMMENDATIONS

- There is a need to continue combining stoves and solar kits projects interventions in order to maximize the impact;
- There is a need to continue the process of dissemination, sensitization of the use of the improved stoves and solar kits;
- There is a need to expand the project to new areas with clear needs of solar kits and improved stoves;
- We recommend the introduction of improved stoves in Mapulanguene;
- There is a need to create incentives for women entrepreneurs to become mobile money agent in order to facilitate their business and avoid waiting long time before they get payment of the solar kits and improved stoves;
- There is a need to find incentives for the entrepreneurs and field activists to continue the business;
- There is a need for identification of strategic partners and places to establish new selling points and or expand the project;
- Project implementers need to capitalize the gains of the project in order to use such gains in future interventions. Gains may be in terms of trained people, existing know how, working resources and established partnership.
- The review team recommend to find one minute every day in relevant TV channel to broadcast the relevant aspects of using improved stoves and solar kits;
- There is a need to schedule continuous capacity building or refreshing trainings;
- There is a need of a good and comprehensive communication strategy;
- There is a need to lobby and do advocacy to the high level
- Looking to the positive impacts and the motivation of beneficiaries in different visited communities, the review team would like to recommend to extend the project for some more years;

10. CONCLUSIONS

- Looking to the influence the Naturvernforbundet's EmPOWERing Communities Program is having in different areas, we conclude that access to basic energy services is essential to reach most of the SDG, thus a need to link energy access with other existing development initiatives;
- The review team concluded that the talent, creativity and entrepreneurial vigor of women from the target communities is helping to make the solar kits and improved stoves interventions growing in a sustainable way and contributing for women economic empowerment;
- The review team noted that in many communities the approach to involve women contributes to increase and accelerate access of improved stoves and solar kits to more houses. There is a need a need to continue involving women in the interventions;
- In general, all evaluated countries, showed to be undertaking efforts to have adequate energy policy and regulatory framework to support the renewable energy technology. The review team suggests that the policy need also to take into consideration the productive use of energy. If possible NNV could support the Productive Use of Renewable Energy (For irrigation, for offices to extend operating hours, create value added-products, etc.)

11. REFERENCES:

1. Renewable in Mozambique –National Status Report (ALER, 2017)
2. Master plan Power Generation (MIREME, 2018)
3. Thermal solar technology Road Map and implementation (ENPCT)
4. Beyond Connection Energy Access redefined (ESMAP, 2015)
5. Access to Clean cooking energy and electricity – survey states (CREEW Report 2015)
6. Measuring Energy Access: Supporting a global Target (the earth institute – Columbia University, 2010)
7. Estratégia de Uso e Conservação da Energia da Biomassa (ME, 2013)
8. Integração da abordagem de Género no sector de Energia Manual sobre o género e energia- Ministério da Energia- 2015

ANNEX I. CONTACT DETAILS FOR NATURVERNFORBUNDET'S COOPERATING ORGANIZATIONS IN AFRICA

For the inception phase the review team presented a list of stakeholders from the cooperating organizations in Africa. An updated list of stakeholders and all identified informants relevant to the project for the review is also attached as Annex IV of the final report.

Country	Organization	Contact Person	Email	Alternative Email	Street address
Mozambique	ADEL-Sofala	Hamid Taybo	adelsofala@tdm.co.mz	hamidtaybo@hotmail.com	Rua Perô de Covilhã 1005, Beira
Mozambique	KULIMA	Anathalie Musabyemariya	kulima@kulima.org	anathalie2004@yahoo.fr	Avenida Karl Marx 1452, Maputo
Mozambique	Livaningo	Manuel Cardoso Junior	livaningoong@gmail.com	cardosojunior21532@gmail.com	Rua da Guarda 17, Maputo
Togo	JVE	Sena Alouka	yvetogo@hotmail.com	yvetogo@hotmail.com	131 rue Ofe, Tokoin Casablanca, Lomé
Nigeria	ERA	Godwin Uyi Ojo	eraction@eraction.org	gloryline2000@yahoo.co.uk	#214 Uselu Lagos Road, Ugbowo, Benin City

ANNEX II. CONTACT DETAILS OF RELEVANT INFORMANTS

Country/ Province	Organisation	Contact Person	Role
Mozambique	ADEL-Sofala	Hamid Taybo	<u>Coordinator</u>
Mozambique Maputo	KULIMA	Anathalie Musabyemariya	<u>Coordinator</u>
Mozambique Maputo	Livaningo	Manuel Cardoso Junior	<u>Coordinator</u>
Mozambique Sofala,	Grupos de Poupanca	Elina Ernesto	Entrepreneur
Maputo	Secretaria do Bairro	Sara	Entrepreneur
Maputo	Chefe do Quarteirao	Percina	Entrepreneur
Mozambique Sofala	ADEL-Sofala	Abdul Timane	<u>Technical Staff</u>
Mozambique Maputo, Moamba	Kulima	Flavio Saraiva	<u>Technical Staff</u>
Mozambique Maputo, Manhiça	Kulima	Jose Carlos Sueia	<u>Technical Staff</u>
Mozambique Maputo, Palmeira	Kulima and Livaningo	Felix Chiale	Field Activist

ANNEX III. CONTACT DETAILS OF VISITED AND INTERVIEWED STAKEHOLDERS

N.	Name	Partner Organization	Beneficiary of /Occupation	Location
1	Cecília Moemba	KULIMA	Improved Stove	Bairro Sul- Moamba
2	Catarina Machel		Improved Stove	Bairro Sul- Moamba
3	Elisa Chiluvane		Improved Stove	Bairro Sul- Moamba
4	Elisa Siteo		Improved Stove	Bairro Sul- Moamba
5	Ermelinda		Improved Stove	Bairro Sul- Moamba
6	Laura Cuna		Improved Stove	Bairro Sul- Moamba
7	Rosário Sindique		Improved Stove	Bairro Sul- Moamba
8	Mahumane		Improved Stove	Bairro Sul- Moamba
9	Albertina Machava	KULIMA	Improved Stove	Matibjwana- Palmeiras
10	Azelia		Improved Stove	Matibjwana- Palmeiras
11	Celia Pedro Baloi		Improved Stove	Matibjwana- Palmeiras
12	Celeste siteo/ Constantino Cossa		Improved Stove	Matibjwana- Palmeiras
13	Guida Alfredo Mugabe		Improved Stove	Matibjwana- Palmeiras
14	Laura	Met in the field	Collecting Firewood	Matibjwana- Palmeiras
15	Marta Marcelina Malo	KULIMA	Improved Stove	Matibjwana- Palmeiras
16	Félix Chiale		Activist/improved stove	Matibjwana- Palmeiras
17	Sara		Entrepreneur- Solar Kits	Gohloza - Maputo
18	Percina		Entrepreneur -Solar Kits	Mukatine - Maputo
19	Dionísia Elias Membirre		Activist/improved stove	Matibjwana- Palmeiras
20	Cândido		Activist/improved stove	Matibjwana- Palmeiras
21	Samison		Activist/improved stove	Matibjwana- Palmeiras
22	<u>Nilda faz bem cossa</u>		Teacher	Mapulangune-Magude
23	<u>Zefanias Machava</u>		Teacher	Mapulangune-Magude
24	<u>Elisa Albino Macucule</u>		Nurse	Mapulangune-Magude
25	Gertrudes José Zandamela		Nurse	Mapulangune-Magude

26	Leonor Machel	LIVANINGO	Solar Lantern	Mapulanguene -Magude
27	Anita Ngovene		Solar Lantern	Mapulanguene -Magude
28	Neli Adriano Ubisse		Solar Lantern	Mapulanguene -Magude
29	Ana Cristina		Solar Lantern	Mapulanguene -Magude
30	Elisa Macucule		Solar Lantern	Mapulanguene -Magude
31	Isaura Cossa		Solar Lantern	Mapulanguene -Magude
32	João Baptista (Secrétario do Bairro)		Solar Lantern	Mapulanguene -Magude
33	Leonor Mondjovo		Solar Lantern	Mapulanguene -Magude
34	Zailina Adriano Lamula		Solar Lantern	Mapulanguene -Magude
35	Artur Munjovo		chefe da secrectaria	Mapulanguene -Magude
36	Timóteo Zeferino Mazive	LIVANINGO	Producer of Improved Stoves	Mawandhla 2- Magude
37	Carlos Alfiado Vilanculo		Producer of Improved Stoves	Mawandhla 2- Magude
38	Florencia Mualela		Improved Stove	Mawandhla 2- Magude
39	Carlos Vilanculo		Improved Stove	Mawandhla 2- Magude
40	Sónia Figueredo Matusse		Improved Stove	Mawandhla 2- Magude
41	Albertina Wati	LIVANINGO	Improved Stove	Bairro 3 de Fevereiro
42	Amélia Khongolo		Improved Stove	Bairro 3 de Fevereiro
43	Rute Macamo		Improved Stove	Bairro 3 de Fevereiro
44	Maria Djombene		Improved Stove	Bairro 3 de Fevereiro
45	Linda Massinga		Improved Stove	Bairro 3 de Fevereiro
46	Florinda Lhongo		Improved Stove	Bairro 3 de Fevereiro
47	Felicidade Miambo		Improved Stove	Bairro 3 de Fevereiro
48	Lídia Ndjive		Improved Stove	Bairro 3 de Fevereiro

ANNEX IV. INTERVIEWS WITH IMPLEMENTING PARTNER INSTITUTIONS

SUMMARY OF INFORMATION CAPTURED DURING THE INTERVIEWS WITH IMPLEMENTING PARTNER INSTITUTIONS

Questions	Kulima	Adel Sofala	JVE	Livaningo	ERA
Are you satisfied with the opportunity to implement the energy project? Why?	Yes, we are satisfied. This project gave more visibility to Kulima, we now became a national reference in the area of Energy and it is helping many communities;	Yes. Because the NNV technically and financially support to ADEL helps to provide access to sustainable energies to the communities;	YES. Because of the improvement of the local peoples living conditions especially the indirect benefits	Yes, we are satisfied. Because apart from helping to expand the activities, the NNV programme offers an opportunity to provide the basic energy access to the remoted communities; It is also an opportunity to challenge the government to prioritize interventions with the small energy system.	Yes, we are. There are immense opportunities to change mindsets, enhance clean energy acceptance by communities and close the energy accessibility gap
what do you find positive about the Program?	The Programme helped Kulima to develop an impactful market strategy appropriate for the context and the marketing of solar kits and improved stoves it helped to reduce negative impacts caused by the deforestation and helped communities to	The project's actions have a major contribution to the family economy and in the mitigation of environmental negative impacts caused by deforestation, ensuring access to improved cook stoves and sustainable energy technologies,	The fact that the programme addresses an urgent need in the Togolese community; Due to the programme and the advocacy behind it, the government has now adopted the energy policy	The easy, permanent contact and openness of partners (NNV); Even with the restructuring the community has joined the initiative.	Our focus on youths, out of school and vulnerable persons to lead the transition towards clean renewable energy as well as enhancing their capacity to make a living from protecting the environment

	have income and take care of their families.	reducing intensive use of biomass resources. It is also contributing to the establishment of local micro-enterprises that begin to include the sale of energy products	as well as the drafted the Renewable energy tax law.		
Are the project objectives clear?	The objectives are very clear	Yes. Because the project has a specificity that is to promote the use of sustainable energies (improved stoves and solar lanterns), guaranteeing accessibility and availability for families	Yes. The objectives are clear	-	Yes
what would you like to change / do differently?	Introduce the “Pay as You Go” in places where it is possible, in order to avoid losing funds; Promote other kind of solar lamps; Have more private sector investing in	We would like the have more opportunity to share the experience and challenges with the different NGOs involved in the program.	I would like to see in the programme more guide materials and tools on collection and documentation of impacts on the field. More focus on comprehensive accompaniment of	We would like to learn from other partner about their energy policies and if possibly get a copy of their policy in order to compare / see if NNV partner are in similar level in terms of energy development.	We would like to attach a mentorship process to our work to ensure that our young people have access to sound advice from experts who have run successful businesses so as to greatly enhance their chances of success.

	energy sector so that the prices can reduce.		communities on education and sensitization for Behavioural change purposes coupled with the distribution of solutions. Right now, a focus is put on the distribution of equipment.		
What challenges do you face in implementing the Project?	<p>We are concern with the Slow Change of mentality in the target communities;</p> <p>Lack of Government involvement at the high level;</p> <p>A clear police and guidelines coming from the government is needed. Kulima wishes to see the Mozambican government imposing the use of RE like in other countries. The use of improved cook stoves should be mandatory;</p> <p>The import taxes for renewable energy</p>	<p>High up-front costs of solar lanterns;</p> <p>Ensure greater involvement of the private sector in project activities as a way of contributing to the development of the market for sustainable energy products;</p> <p>Establish a link between the project activities and other sectors such as health, education, agriculture and the environment to ensure the sustainability of the activities;</p>	<p>-Inadequate or limited national policies that promote Renewable energy making the solar products very expensive to import and also costly to the target group (rural communities)</p>	<p>Constant restructuring of local structures;</p> <ul style="list-style-type: none"> - Low government openness for collaboration with Civil Society; - Means of transport <ul style="list-style-type: none"> - Lack of systems in the market (we refer to those that Livangingo has been promoting in the communities). - Constant restructuring of local structures 	<p>The obvious gender imbalance of our participating groups and how to address this. There is also the need to discover how other vulnerable persons and persons with disability are not in formal school settings and where and how we could reach out to them in our focus communities</p> <p>We still face some resistance from community leaders who believe that they should be driving this process and not the young</p>

	<p>equipment is still very high.</p> <p>How to maintain the reputation that we have built;</p> <p>Kulima lost many women activists because of unwanted pregnancies. How to maintain the number of female activists in the programme?</p> <p>Producers like to work individually not in groups</p>	<p>Ensure more participation of women in the energy business;</p> <p>Overcome cultural barriers which constitute a factor of inhibition in some cases (stoves spares wood);</p> <p>Ensure greater involvement of people with physical and visual impairments in business.</p>		<ul style="list-style-type: none"> - Ensure greater involvement of people with physical and visual impairments in business. 	<p>persons that we work with.</p> <p>How to deal with the flood of cheap imported renewable energy gadgets which breaks down easily. Leading to depressed demand for genuine products</p>
<p>How would you like to see the next phase? What activities would you like to schedule for the next phase, bearing in mind the reality of your country?</p>	<p>Capacity building for the charcoal producers because in 2018 failed to be trained due to elections in the country;</p> <p>Continue capacity building for the field activists and entrepreneurs to fill the gaps of those who gave up, pregnant girls, new for the expanding areas;</p>	<p>Advocacy and Promotion activities (community mobilization, expansion of solar kits selling points at the local level);</p> <p>Promotion of the productive use of renewable energy.</p> <p>Linking the Renewable energy products with the productive sector (eg agriculture, livestock,</p>		<p>In the next phase I would turn to the production of evidence (videos, research / studies). Considering the national reality, I believe that there should be more local actions (campaigns and capacities in the assembly and installation of systems) at the central level, more workshops and round tables with</p>	<p>Expansion on what we are currently doing but with the expectation of closing the gender imbalance and the non-participation of persons with disability</p> <p>Provide a quality assurance facility for locally fabricated cookstoves or a testing centre</p>

	<p>To document the lessons learnt and good practices and share with the different stakeholders</p> <p>To involve more the private sector and make a power alliance on energy sector;</p> <p>To involve more communities and implement others services</p>	<p>fisheries, trade.) Including social sector (schools, churches and hospitals);</p> <p>Focus programs on environmental education, resilience to climate change and gender;</p>		<p>government, private sector and academies, as a way to complement the actions.</p>	<p>We will also need to provide Kiln for firing the locally fabricated cookstoves</p>
<p>What does your institution do to ensure the sustainability of the programme?</p>	<p>During the implementation of the project Kulima has trained many people to deal with production, marketing, community sensitization;</p> <p>The trained people will be an important asset for the coming 2 years of the project;</p> <p>After all acquired experience and knowledge Kulima believes that the</p>	<p>Establish links and coordination between existing solar lanterns suppliers and operators/resellers (entrepreneurs)</p> <p>Establish new selling points (So far 51 established);</p> <p>Establish partnership with the private sector, savings and credit groups for marketing of solar lanterns, improved stoves</p>		<p>In order to ensure sustainability, Livaningo is preparing to submit to the private sector financial proposals to seek their support;</p> <p>Livaningo has started reducing office and operation costs;</p> <p>Livaningo is piloting a social business model for the activities.</p> <p>Livaningo wishes to have training on financial</p>	<p>Ensure that only genuine products are marketed by our young entrepreneurs.</p> <p>That as much as possible that the products they fabricate are of high quality.</p> <p>Provide training and enhance entrepreneurial skills.</p> <p>create a mentorship program that provides relevant real time</p>

	<p>institution has already created bases and has the necessary tools to give continuity of the project, with the market growing big and will even grow bigger, in future.</p> <p>Kulima is trying to link the groups created to others credit institutions so that they can continue their energy activities.</p> <p>To fundraise more energy projects to complement the ECP;</p> <p>Regular monitoring visits during implementation of others Kulima Projects.</p>	<p>at the local level to ensure a return on investment;</p> <p>Capacity building for the energy entrepreneurs in basic business management issues and writing a good business plan to help expand selling points;</p> <p>Establish new selling points according to the area of interest of the different target groups;</p> <p>Link NNV funded actions with other ADEL projects;</p> <p>Encourage the participation of women in energy business;</p>		<p>sustainability. The first training was done in April.</p>	<p>business advice and direction.</p> <p>Connect our trainees to already existing renewable energy product dealers.</p> <p>Ensure that we put in place a scheme that incentivizes the repayment of financial and product support provided to start their businesses.</p>
<p>How is your country regarding the approval of policies and strategies</p>	<p>Lack of Government involvement at the top level.</p> <p>A clear police and guidelines coming from the government is needed. Kulima wishes</p>	<p>There are policies and strategies linked to sustainable energies, some still in a form of drafts;</p> <p>The most important aspect is how KULIMA, ADEL and LIVANINGO, together can</p>	<p>The country has Inadequate or limited national policies to promote Renewable energy</p>	<p>Although many communities still do not have access to energy, it is notable that between 2017 and mid-2018, the government has tended to focus on renewable</p>	<p>There are opportunities opening up in Nigeria for expanding access to cookstoves with the launch of the Green Bond by the Nigerian government and the</p>

<p>related to Energy?</p>	<p>to see the Mozambican government imposing the use of RE like in other countries. The use of improved cook stoves should be mandatory;</p> <p>The import taxes for renewable energy equipment is still very high.</p>	<p>influence changes to be reflected in a more robust and competitive market with affordable prices for the local level beneficiaries;</p> <p>May be it is time to think on a common plan of lobbying and advocacy, involving different actors working in the area of energy and demonstrating to the government, including parliamentarians, the main constraints (technology, customs tariff, access to credit, power of attorney, purchase ..) affecting market development.</p>		<p>energy, although costs are high.</p>	<p>interest of the Rural Electrification Agency in supporting access to renewable energy products. ERA has also been pushing policies around zero taxation for renewable energy products</p>
<p>Do you have anything to say about funding arrangements? Are the funds</p>	<p>Funds are enough but we wish we could get more funds to allow us expand to new areas to maximize impact, train more field staff and</p>	<p>Increase funds for greater program inclusion, ensuring the link of energy products with other sectors like agriculture, livestock, fisheries, trade.</p>	<p>-</p>	<p>Regarding the funding mechanisms, Livaningo is happy. It is good!</p> <p>But considering the location of our target group and their energy</p>	<p>We are satisfied with the funding we have received so far. If we would require extra funding it would be to create a testing centre</p>

<p>enough? Would you like to see increased funds? If yes, for what purpose?</p>	<p>activists, have more monitoring and review and regular field visits;</p> <p>Funds could also be to support creation of condition for field staff;</p> <p>As Kulima is implementing the program in the south of the country (Maputo, Gaza and Inhambane), if funds are increased, they could reinforce and expand to more communities.</p>	<p>Additional funds could also be used for environmental education programs, resilience to climate change and gender linked with energy.</p>		<p>needs and currency fluctuations (fuel and services) the funds have not been sufficient (a series of campaigns, capacity building were scheduled, but due to changes in the price, there was a need to look at the priority actions);</p> <p>Livaningo suggests that If there is an increase of funds, it would help to invest more in community mobilization and capacity-building campaigns, conduct research / studies to produce evidence, establish communication and information centres in communities, and strengthen partnership with academia, government, and the private sector.</p>	<p>for locally fabricated cookstoves and</p> <p>- Secondly the provision of Kiln services for local fabricators of cookstoves</p>
---	--	--	--	--	---

ANNEX V. SIMPLIFIED OVERVIEW FOR TIERS OF ENERGY ACCESS FOR HOUSEHOLDS

	Light	Information and Communication	Cooking	Other services	Typical technologies for light/electricity	electricity consumption
Tier 0	No good light for working/reading	No	Three-stone wood fire, traditional charcoal	No	Burning wood, candles kerosene, touches	0
Tier 1	Bright task light, min 1000 lumen/h	Possible to charge min one phone/day	Improved stove 15 % eff. Reduce health impact	Phone, Radio	Powerful lantern with USB-port 3 Wp/12 Wh	More than 4,5 kWh/y
Tier 2	Task light and general lightning	Phone/tablet	Improved stove 25 % eff. Less health impact	TV, fan	Small home system 50 Wp/200 Wh	More than 73 kWh/y
Tier 3		PC, printer	Improved stove 35 % eff. Small health impact	Medium energy-demanding appliances	Home/micro-grid 200 Wp/ 1 kWh/day	More than 365 kWh/y
Tier 4			Biogas, LPG, Ethanol etc Low risk for health impact	Fridge and energy demanding appliances	Big home system/mini grid. 800 Wp/ 3,4 kWh/day	More than 1.250 kWh/y
Tier 5			El, biogas, LPG, ethanol etc No health impact	Air-condition and very energy demanding appliances	Grid access 2.000 W/ 8,2 kWh/day	Over 3.000 kWh/y

Source: **Summary by Naturvernforbundet**

ANNEX VI. THE REVIEW TEAM

1. Gilda Claudina Sumbana Monjane

Gilda Monjane is a consultant and entrepreneur with more than 20 years' experience working in development, economic empowerment, and social enterprise. She holds a Master Degree in Sociology and Rural Development concluded at Eduardo Mondlane University in Mozambique. For the final dissertation she has done a research on the relevance of solar energy for rural development and Gender Empowerment. After conclusion of Master studies, Monjane created an initiative aiming to promote access to energy for people living in off grid areas. The initiative was distinguished with six international Awards and it helped to sell more than 12 thousand solar home systems, since 2011. Gilda Monjane has experience in working with the government, civil society and development partners in gender issues and private sector development, undertaking studies and providing capacity building activities, most of them on gender and Energy in Mozambique and abroad.

Gilda Monjane has done project and or programme reviews for different partners and companies that wished to test material in Mozambique. As a member of the Pan African Climate Justice Actions (PACJA), has also done some evaluation of projects that involved more than one country. In different occasions, she was requested to help implement energy related activities. She worked as consultant for the National Renewable Energy Laboratory (NREL) and for the Ministry of Mineral Resources and Energy (MIREME).

2. Inocencio Pedro Gujamo

Inocência Gujamo graduated in Applied physics from Eduardo Mondlane University. After finishing the course in 2011 he engaged in rural electrification through photovoltaic systems having promoted peak-systems in several communities of Maputo, Gaza and Inhambane provinces. Gujamo implemented small projects to promote renewable energies in rural areas including knowledge transfer through the installation of photovoltaic systems. He was also involved in training sessions to rural communities. He supported the assembling of the Solar Pico systems for Fosera company in Mozambique. He worked as a researcher with the renewable Energies Group at the Physics Department, Eduardo Mondlane University (UEM). He was part of the trainers for District government technicians of Chibuto, province of Gaza, in coordination with GIZ and the company EREL, LTA. The training was on the operation and installation of Pico Photovoltaic systems. He is currently working as graduated technician of renewable energies at the National Directorate of Energy. He was involved in evaluation of different energy projects.

3. Zaina Manuel Mamada

Zaina, Mozambican, graduated in forestry engineering from the Faculty of Agronomy and Forestry engineering at Eduardo Mondlane University (EMU), in 2010. She is currently enrolled for the statistics and information management course at the Pedagogical University of Mozambique. In 2010, Zaina attended the analyst programm course at the data Processing center in Maputo. In 2012 she worked in Nampula, Zambézia, Cabo Delgado, Niassa, Manica, Tete and Sofala provinces as Junior a soil consultant for agriculture suitability for the national Agro-ecological zones. She has worked as the Technical Field Coordinator for CleanStar Mozambique in Savane-Dondo, Sofala Province, where the main task was to guarantee the production of cassava for ethanol production.

In 2013, she participated in the testing of the energy efficiency for the improved cook stoves production at the EMU laboratory. Currently, Zaina works at the Ministry of Mineral Resources and Energy at the Department of Renewable Energy. Her main task is to support the design of policies and promote the use of renewable energy in Mozambique. She also works to evaluate different project opinions and to develop regulations and projects in the renewable energy subsector. She has participated in the elaboration of the biomass strategy, where the use of improved stoves was one of the purposes of the strategy. She has worked with communities, doing active demonstrations of improved stoves. She had the opportunity to visit a variety of improved stove projects in South Africa and share information about programs of the energy sector.

4. Nina Blid

Nina Blid, holds a Master's degree in International Development and Management from Lund University, Sweden since 2016. Previously she was trained as an agronomist at the University of Zambia, and studied agricultural economics at Iowa State University, USA. A Swedish citizen, she has worked in Mozambique for more than 20 years managing projects promoting rural finance, civil society, and governance. Since 2017 she is the director of the consultancy firm Steglarp Serviços that focuses on gender, governance and rural development.

ANNEX VII. TERMS OF REFERENCE

Terms of Reference

1. Introduction

The basis for the review is the program plan for 2017-2020, which is part of Naturvernforbundet's agreement with Norad (GLO-0634 QZA-16/0392).

The program is facilitating access to modern energy services for households in Mozambique, Togo and Nigeria. This is done by promoting locally produced improved cook stoves and small solar electric systems for light and charging of phones. In Mozambique, Naturvernforbundet cooperates with ADEL-Sofala, Kulima and Livaningo. In Togo, the partner organization is Young Volunteers for the Environment (YVE). In Nigeria, it is Environmental Rights Action (ERA).

The review will be made publicly available in Norad's database.

2. Purpose

We want

Results on the outcome level are straight forward to monitor (number of sold stoves and lamps), so we will rather use the review to assess the impact of the program, presented in the program's development goal and associated indicators:

Households benefit from new access to affordable, reliable, sustainable and modern energy solutions (SDG 7).	1. To which extent the users report less respiratory and eye problems
	2. To find out to which extent the households actually benefit from access to modern basic energy solutions and to get suggestions for how to improve further results.
	3. To which extent the users report that they get more time for production/ leisure
	4. To which extent the users report that they have easier access to electronic information
	5. To which extent the users report that they save money

3. Key questions

- With reference to the impact indicators, what is the impact for the users?
- What should be changed in the implementation to improve the impact?

- With reference to the impact indicators, how are the partners’ regular monitoring data compared to the review team’s findings?
- Which critical elements should be highlighted in the partners’ monitoring to facilitate increased future impact?

4. Geographic and thematic focus

To allow the review to go into needed details, and due to limited resources, it will be necessary to limit the review geographically and thematically:

Geographic focus will be on Mozambique, as it is the country with the biggest share of the funding. We are nevertheless confident that the review will be meaningful for the other countries, too.

Thematic focus will be on improved stoves for firewood in rural areas. This is the type of communities with the biggest challenges regarding energy access. This is also the type of communities where basic energy access³ is the most realistic solution if we are to reach universal access to modern, reliable and affordable modern energy services within 2030.

5. Methodology

The review team shall consist of a team leader and one or two team members and at least one of each sex.

Step One: Document Review and Analysis

This step will comprise the review of documents and content analysis of the reports, proposals, assessments, monitoring reports and data, and other identified documents in various areas to include (but not be restricted to):

- Program documents
- Relevant documents and reports from
 - the program organizations, with emphasis on ADEL-Sofala, Kulima and Livaningo
 - recommendations from Global Coalition for Clean Cookstoves and WHO
 - SDG 7 – SE4All global tracking framework

The document analysis will also include success stories, lessons learnt and recommended best practices since the inception of the program to date.

Step Two: Development of Data Collecting Instruments

³ We define “basic energy access” as access to energy services (cooking, light, ICT) according to tier 1 to 3 in SE4All’s multi-tier framework. See: [Beyond Connections: Energy Access Redefined](#)

Issues arising from the review of the available documents will be used as a precursor to the development of data collecting instruments, which will be developed to guide the collection of data from various sets of respondents. Instruments/ guidelines will then be designed to facilitate the collection of relevant information in the field. The instruments will include:

- Various in-depth interview schedules that will be driven by the information anticipated from the key stakeholders to be interviewed. Those proposed interviewees include
 - Key program staff
 - Community leaders and opinion shapers
- Focus group discussion guidelines
 - The review process shall be gender sensitive, meaning i.a. that women must be able to present their views to the review team where relevant and that the team gets hold of and presents gender specific data and information in their work
 - Observation checklist to be used during the field visits

Naturvernforbundet acknowledge the need to measure improved stove efficiency and smoke levels connected to clean cooking. This is not a part of this tender, but we welcome suggestions for how this can be included or developed as an additional task.

Step Three: Data Collection

Data will be collected from the following respondents:

- Personnel from Naturvernforbundet
- Personnel from local partner organizations (skype meetings with YVE and ERA)
- Local community leaders and opinion shapers
- Local community members in the program areas (men and women separately)
- Relevant government officials

Naturvernforbundet and the Mozambican partner organizations will work with the review team to identify a limited number of communities for the review. This should include some communities that presently have introduced simple, locally made improved cook stoves with chimney and some which are in the process in 2018. The selection should include communities both with and without connection to the national electricity grid. This is to look at whether there are differences related to cooking habits and to see effects of promotion of solar lanterns in the off-grid communities.

This approach will make it necessary for the evaluation team to visit the communities at least twice (which also limit the possibility to cover larger geographic areas).

Step Four: Analysis of Data and Information

The information collected through the document analysis, in-depth interviews and the focus group discussions will be analysed on the basis of the purpose and the key questions above.

6. Organization

In general, it is Naturvernforbundet's responsibility to implement and follow-up the review, with the participation of the program partners.

Specific responsibilities of:

- the review team leader:
 - achieve the purpose and respond to the key questions above
 - planning and coordinating the review, assisted by the team member
 - making the best use of the team member's qualifications
 - preparing and leading the interviews and discussions during the review
 - producing the inception report, the draft review report and the final review report, assisted by the team member, and in accordance with the requirements in point 7 below
- the review team member(s):
 - assist the team leader to achieve the purpose and respond to the key questions above
 - carry out all the requirements of the review related to his/ her qualifications and experiences
 - participate in all the interviews and discussions during the review
 - assist the team leader in:
 - the planning of the review
 - the review and analysis of the documents made available to the team
 - the production of the inception report, the draft evaluation report and the final evaluation report
- Naturvernforbundet
 - the review manager:
 - organizing the review
 - being responsible for the day-to-day administration
 - present the basis for the working group's decisions

- participate in the review team’s last round of field visits, as far as the team leader allows
 - the working group (the Director of the International Dept and the review manager):
 - make the important decisions throughout the review
 - give comments to the draft review report and have one representative to be associated to the review team during one of their field visits
 - the Director of the International Dept (the owner of the review):
 - approve the review report
- local partner organizations:
 - give inputs to the development of the contract and the ToR
 - give practical assistance to the review team (secure accommodation and transport, arrange for meetings with own staff and other stakeholders)
 - have one representative to participate in the review team’s field visits, as far as the team leader allows
 - give comments to the inception report and the draft and final review report
 - participate in the follow-up of the review.

7. Deliverables

Inception report

Within a few pages the inception report shall present:

- adjustments and/ or specifications of the methodology and the time schedule which the review team finds necessary after having read the documents made available to them and after having gone deeper into the planning of the entire review
- the team’s list of which sites they will visit and who to approach among the stakeholders
- division of tasks within the team.

Review report

The draft and final review report shall have the following chapters:

1. Summary
2. Introduction (including purpose and key questions)
3. Methodology
4. Findings
5. Recommendations
6. References

An executive summary of a maximum of two pages shall provide an overview of the report, describing the review’s background, purpose and methodology, and the review team’s key findings and recommendations.

The main report (chapters 2-5) shall have a maximum of 30 pages, with a short background and with the emphasis on chapters 4 and 5, written in English. The recommendations shall be clear, relevant, targeted and actionable. The report shall assess the validity and reliability of information sources and acknowledge limitations of the review.

8. Number of work days

Activity	Team leader	Team member(s)	Total
Preparation	5	3	8
Field/ partner visits	13	13	26
Reporting	7	3	10
Total	25	19	44

9. Time schedule

Time	Activity	Responsibility
25 Feb	Candidates have presented their bids/ offers	Candidates
5 March	Final contracts, including the Terms of Reference, are signed	Review manager
	Initial documents are submitted to the team	
Mid-March	An inception report is submitted	Review team leader
End March	The inception report is approved	Working group
April	First field/ partner visit	Review team
September	Second field/ partner visit	Review team
27 September	A draft report is submitted	Review team leader
10 October	The comments are given to the review team	Working group + local partner organizations
17 October	The final report is submitted	Review team leader
24 October	The final report is approved	Working group