

Mid-Term Evaluation

Clean Energy in Africa Programme of
Naturvernforbundet (Friends of the Earth
Norway)

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List of Acronyms

ADEL-	Agência de Desenvolvimento Económico Local (Agency for Local Economic Development)
CSOs	Civil Society Organizations
CBOs	Community Based Organizations
FEDESMO	Fórum de Energias e Desenvolvimento Sustentável de Moçambique (Forum for Sustainable Energy and Development in Mozambique)
FUNAE	Fundo Nationale de Energia (National Energy Fund of Mozambique)
JVE	Jeunes Volontaires pour L'Environnement (Young Volunteers for the Environment)
LEDC	Local Energy and Development Committee

1.0 Executive Summary

The main purpose of this mid-term evaluation was to make improvements within the Clean Energy in Africa programme of Naturvernforbundet (Friends of the Earth Norway) which is a five-year project (2012-2016). It specifically focused on achievements measured by the outcomes, outputs and selected indicators, the most important learning points and the best practices. These would inform the strategic roles for Naturvernforbundet and partners to contribute to universal access to clean energy in households. Through selected qualitative methodologies, this evaluation also reviewed the relevance, efficiency, effectiveness, impact, sustainability and the risks/assumptions developed at the start of the programme.

In the Clean Energy in Africa programme, Naturvernforbundet is currently cooperating with two major networks: JVE International based in Togo and FEDESMO in Mozambique. The programme is mainly funded by Norad. The working model for Clean Energy in Africa programme is to enlist membership at national and regional levels among various stakeholders including governments, relevant state agencies as well as the community through community groups, organizations and even individuals.

The main programme activities are improving access to clean energy at household and institutional level, sustainable charcoal production, information and energy education, and policy advocacy. The Networks have extended the scope of activities beyond energy issues to include climate and biodiversity issues. The activities are implemented through community mobilisation and training, market driven approaches to deploying improved cook stoves and micro solar PV systems. Other potential technologies such as biogas and *casamance* kilns are first demonstrated. Community led energy and environment committees have been formed and these are driving local level developments. The approach has also started in Togo. The member networks have become influential through their demonstration projects and this recognition has seen them participate in national programmes and processes on energy and environment policy. JVE actively participates in COP meetings. In Mozambique the Nhangau reforestation project has become a national example of community initiative for reforestation of degraded lands. One of the most viable entry points into communities was through micro credit and savings groups and these have become some of the majority members of the networks and instruments for raising awareness about environment and energy issues.

The main achievements of the programme included the setting up and running of strong vibrant energy and environment networks in Mozambique and West Africa. The national network (FEDESMO) in Mozambique has achieved legal status and is recognised by the government. The director of renewable energy in the Ministry of Energy is the chairperson of the Network. In West Africa, the achievements include the establishment of the JVE International secretariat

which has representation in more than 22 African countries. All networks are running successful energy and environment projects in their countries contributing to universal access to clean energy through improved cook stoves.

Challenges and constraints include the heavy reliance on Naturvernforbundet for funding of project activities posing a risk to sustainability and project implementation. The current status where pilot demonstration projects on stoves, micro PV systems and the establishment of standards are still under development is also a major challenge to goal achievement. Constraints to market deployment of technologies include the high cost of products against low affordability and low awareness of improved cook stoves. Production of the improved cook stoves is very well established in some places but has also met challenges, as lack of adequate quality of soil. Production of the improved cook stoves is very well established in some places but has also met challenges, as lack of adequate quality of soil. Unsustainable and unabated extraction and utilisation of biomass still continues. The demonstration of *casamance* kilns in Mozambique is still in infancy and its use is still low. The need for improvement was evident in the area of technical skills in biogas construction and promotion in Mozambique. There is no enabling environment through lack of policies and where they exist, implementation has been weak policy. In Togo, Ivory Coast and Ghana, the members have not adequately addressed policy issues on sustainable use of biomass

There are emerging lessons and best practice cases from the programme in all countries that can be shared among networks. However there is limited knowledge packaging and dissemination. It was evident that there was need to review membership registration especially the membership drive in Mozambique which was noticeably limited. The need was also evident for the recreation of value for membership so that they do not see their participation as an incentive to gain funding but as an avenue for additional programme funding.

Recommendations made to the programme and projects include the increased education of the general public and local governments about energy issues; the collation and packaging of lessons from the projects and programme that could be used for cross learning across networks and other international audience. Enhance market driven approaches in the promotion of improved stoves by addressing the bottlenecks of quality, adequate stoves to satisfy demand and promotion actions. Financing from Naturvernforbundet should be used as seed funding by the networks to leverage additional funds and also diversify the resource base. Supporting the development of fundraising strategies and skills training to write project proposals is recommended.

Currently the need exists for policy advocacy aimed at creating an enabling environment that promotes the sustainable extraction and use of biomass. Active participatory involvement of all stakeholders in major aspects of the programme activities is another key area of need to enhance strict adherence to transparency and good governance especially among the network players.

2.0 Introduction

The basis for this evaluation is the programme plan for 2012-2016 which is part of Naturvernforbundet's agreement with Norad. Togo and Mozambique host the main implementing partners of Naturvernforbundet's Clean Energy in Africa programme. Togo hosts the office of JVE International, and it is this office that cooperates with Naturvernforbundet. JVE has now national representation in more than 20 African countries, with some receiving direct financial benefits from the programme. In Mozambique Naturvernforbundet cooperates with the national energy and development forum FEDESMO and also directly with the forum member organisations of ADEL-Sofala, KULIMA and Livaningo.

This midterm evaluation assessed objectives, results, challenges and assumptions made at the start of the five-year period. Further, it provides strategic recommendations for the programme in its remaining duration aimed at improving the programme efficiency and finding ways of building democratic organizations with the limited resources. The evaluation reviewed the relevance, efficiency, effectiveness, impact, sustainability and the risks/assumptions. This midterm evaluation assessed the levels of partnerships between Naturvernforbundet and the local partner organizations. In addition this evaluation is key to Norad's organizational mid-term review of Naturvernforbundet.

3.0 Background

Demonstration or pilot projects in cooperation with local partners constitute the major part of Naturvernforbundet's international work. In the Clean Energy in Africa Programme, these projects include

- i. Climate/energy where the main activities are in five African countries in the field of practical local energy solutions, but also organizational development/networking/policy work on energy/climate issues.
- ii. Biodiversity
- iii. Organization with the cooperation of Naturvernforbundet on climate issues, biodiversity and energy efficiency

Naturvernforbundet is currently working with countries that are experiencing serious challenges with their national energy and climate issues through assisting local partner organizations with capacity building and organizational skills in order to strengthen and expand their work within this sector. Naturvernforbundet has been involved with the partner networks JVE International and FEDESMO in a variety of practical energy projects that serve multiple purposes. They contribute to improving access to basic energy in poor communities using locally available and low cost materials. They build the image and competency of the partners in the energy sector that they use for policy and technological influencing. As a result they are sought by state and development agencies to contribute to policy dialogues and exchange of technical knowledge

Naturvernforbundet's role is to support the local partner organizations through finance and strategic assistance and technical training. Bi-annually they monitor and review progress. The outcome of the review based on successful accounting of the previous budget and delivery of agreed log frame results are conditions for additional funding. . Requests for additional funding are made by the partners through a project proposal using a simple template. The partners have the freedom to identify relevant project activities in line with the programme's overall goals and objectives. Ideally Naturvernforbundet aims at strengthening partner organizations so that they are able to contribute to sustainable development in their own countries.

Naturvernforbundet considers energy efficiency to be the fastest, cheapest and most environmentally-friendly initiative to reduce greenhouse gas emissions, reduce pressure on biological diversity and improve people's living conditions, and that access to clean energy in Africa is crucial to lifting people and countries out of poverty. Unfortunately among several countries where the Clean Energy in Africa programme is involved, energy efficiency has not been adopted into national policies and practical solutions. In Africa, 70 – 80% of the population traditionally rely on use of biomass (firewood and charcoal) for cooking and heating. While charcoal is mainly used in the cities, it is predominantly produced in the countryside. The production of charcoal has been a major cause of deforestation and reduced carbon sinks. Use of biomass is inefficient and unsustainable contributing to increased greenhouse gas emissions.

The traditional practice in the areas of production and use of charcoal and fuel wood in open fires results not only in the loss of most of the energy, but also in the remittance of smoke representing a serious health hazard especially to the users mainly women and children. Thus the facilitation of improved production and increased use of efficient stoves remains a key partnership focus for Naturvernforbundet's Clean Energy in Africa programme in the on-going collaboration in household energy with JVE International as well as the national network FEDESMO in Mozambique.

4.0 Purpose

The evaluation was undertaken to:

- make improvements within the programme for the remainder of the five-years' period of 2012-2016
- be available for Norad's organizational mid-term review of Naturvernforbundet in the second half of 2014

4.1 Objectives

The major objectives of this midterm evaluation were:

1. To identify the main achievements so far in relation to the outcome, outputs and selected indicators in the original five-years' programme plan, and also non-planned achievements
2. To identify the most important learning points and give recommendations to improve relevance, efficiency, effectiveness, impact and sustainability of the programme
3. Based on the experiences in Togo and Mozambique, identify best practices and strategic roles for Naturvernforbundet and partners to contribute to universal access to clean energy in households.

5.0 Methodology

Various methodologies, tools and instruments were used by the evaluation team as a means for collecting and analysing the information. Site visits and key informant interviews were used to collect data. When possible, Focus Group Discussions and the review of relevant documents were also useful in soliciting useful information for this evaluation. Relevant documents including project reports (narratives and financials), the project proposals and logical frameworks were reviewed. Gaps in the over or under expenditure were noted and also challenges and successes that were then confirmed through field visits. In its simplest form, this evaluation highlights the programme contexts, implementation and outcomes.

Field visits were undertaken to a few selected countries due to time limitations and financial resources. These were conducted in Ghana, Ivory Coast, Togo and Mozambique. Interviews were held one on one with key informants. Focus group discussions were also held with various groups to gain an appreciation of the local context and also to learn of the results and challenges that were faced. The availability of the Benin director in Togo made possible an interview and provided this evaluation with an insight into the status of the Benin country program.

6.0 Key Findings

All data and information collected were subjected through the 5-level DAC framework to measure the programme's relevance, effectiveness, efficiency, impact and sustainability. This was used in conjunction with the programme's and the projects' logical frameworks. The findings of this evaluation have been presented in such a manner as to address the major questions raised in the TOR.

6.1 Programme Strategies and Achievements

The strategic goal of the programme is to ensure that the extraction and use of energy takes place in such a way as to benefit the poor and is within nature's tolerance limits. This fits with the Naturvernforbundet's strategy goal of energy development in Africa being done with a minimum impact on climate change and biological diversity and benefiting the poor. The partners through their projects have contributed this goal. At the primary level, major programme strategies and

achievements that are aligned with the needs of the beneficiary communities include:

- Development of strong partnerships and networks with the local government, other partner organizations with similar mandate, individuals and community groups (CBOs and other associations) to increase visibility and chances to achieve common goals. The projects in Mozambique were particularly keen on the use of strategies that encouraged community participation implementing their programmes strategically through the Local Energy and Development Committees (LEDC). A similar process had just started in Togo.
- Collaborating with various schools and institutions of higher education, the projects have been able to introduce various aspects of renewable energy and climate change in the education system as core or extra curricular activities.
- Development of critical mass of men and women with technical skills and expertise in stove production at individual and group artisan level and among the community members. In all the countries visited the promotion of improved cook stoves remains highly relevant since the majority of the people use biomass as energy for cooking.
- Facilitation for stove production through increased access to financial resources and production materials for the artisan individuals and groups enabling the stove producers to produce more stoves into the market.
- Facilitation and supply of the finished cook stoves at a variety of outlets including markets stalls and shops resulting in an increase in income for the stove seller while at the same time impacting on stove dissemination to the general community.
- Support for improved livelihood for members of the community through support for group members to increase individual and group incomes through encouraging community micro-credit facilities.
- Facilitation of partnerships with various stakeholders in various areas of the energy sector including the influencing of energy related policy at the government level, to creating opportunities to partner with related organizations, CSOs, the media and the private sector market issues of renewable energy and to produce cook stoves.
- Clean Energy in Africa strategies that have benefited the communities was also evident in the solar charging stations promoted among members of both JVE International and FEDESMO. Individual as well as community groups were evidently benefiting from the solar panels that were used to raise income through charging of cell phones.

- In the case of ADEL-Sofala, a network member of FEDESMO, reforestation was a key strategy in its activities. ADEL-Sofala is partnering with community organizations to develop medicinal garden targeting HIV/Aids patients and mangrove plantation to ensure an increase in tree cover within the Beira district and averted the effects of deforestation due to charcoal burning and increase fish breeding.

At the secondary level, the national and international network members can be described as beneficiaries of the Clean Energy in Africa programmes. In these instances, various strategies and achievement can be identified as beneficial. These included:

- Financial resources to network members to cater for salaries, administrative costs and their programme activities. These resources have helped to start up demonstration projects through whose lessons are being used to influence policy and practice.
- Development of multi-stakeholder partnerships at international and national levels through the registration of network members creating regional and national visibility in the energy sector.
- Although to a small level, there was evidence of sharing of skills and technical expertise among network members in various technical areas of stove and charcoal production.
- The development of a large database of volunteers and network members who support programme activities when necessary

6.1.1 Programme Indicators, Outcomes and Outputs

From the programme logical framework, it can be observed that there is no indicator for the overall development goal. Indicators with a baseline of 2012 only exist at outcome and output level. With programme activities concentrated on specific aspects that are considered vital to individual country projects like standardization of improved cook stoves, evidence from the field show that the programmes reported that their reference to the logical framework was heightened during the reporting time and when developing new projects. There was no evident reference of the log frame as a continuous reference instrument for project implementation. In particular the interest was with the indicators and outcome level and risks/assumptions were rarely reviewed to reflect the immediate country specific needs. Discussed below are indicators that are seen as unrealistic and need to be amended.

- At outcome level, the indicator on national governments involving local communities in energy planning is a very long term and will not be realistic. So far in Mozambique there are only 2 examples in Sofala of LEDCs that have managed to develop an energy plan. Others are still

struggling as to how to achieve this. Also in Togo, they have just started the planning process and results are yet to be realised.

- The indicator on Mozambique for government to setup requirements for efficient production techniques, whilst it is noble, that may not happen in Mozambique due to lack of proper policy implementation.
- The indicator about updating of the climate change negotiations by government might not be realistic but the advocacy to be included as part of the negotiating team of the national government can be achieved.
- The output on the development of policies is not a realistic goal for the networks rather advocacy or lobbying on specific policy pronouncements.

6.1.2 Gaps in plans and implementation

The evaluation identified various important components that were not covered in the planning and implementation of the programme. These caused serious gaps that affected the programme's outcomes and outputs.

- In Mozambique it was acknowledged that the government has put in place comprehensive policies on biomass and charcoal licensing. However implementation of the policies remains poor and the partners have not taken this discrepancy as an opportunity to influence policy practice. In other countries notably Ghana, Ivory Coast and Togo, whilst unsustainable extraction and use of biomass is acknowledged by all stakeholders, there are no effective lobbying and advocacy for policies that facilitate change in practice.
- There are poorly defined operational strategies for various key components of the programme specifically fundraising, communication, M&E and marketing. Emphasis of network is more focused on outputs as opposed to strategic outcomes.
 - JVE Ivory Coast and Benin country offices are relatively active in their fundraising activities to raise additional funds to supplement Naturvernforbundet funding. Strategies for active fundraising are not well covered in the plans and implementation of the other projects.
 - Communication strategies are also not well defined with lack of clear communication channels to share information or active updating of existing websites. Ivory Coast however had a very impressive communication channel with a network of local media who consistently highlighted energy issues in the local media channels. There seems to be clear discrepancies in brokering knowledge and information of lessons learnt in a structured format. Undefined communication strategies have drastically affected

visibility of the existing projects in some programmes in various sectors of the energy.

- The cycle of production and marketing of improved stoves had an assumption that the product will be of high quality, in high demand and acceptable to the market. Initial efforts towards commercialising the stoves were affected by poor quality of stoves either due to limited skills or quality clay. As a result all networks had to change their plans and concentrate on development of a quality product.
- Whilst Naturvernforbundet has provided training in various areas to the network members, additional skills training is evidently needed. There is loss of staff within the networks for better remuneration and job satisfaction. There is need for continuous training of new members as it has been reported as difficult to get competent replacements. It was also evident that during monitoring and evaluation by the JVE secretariat there was no structured training needs identification. In the case of both networks, training in project proposal writing, fundraising and knowledge of issues related to biomass were cited by both JVE International and FEDESMO as key to their functionality and growth.
- Gaps were also evident in the area of partnership identification with no reference to clear criteria by the organizations for the identification and selection of partners. The multiple number of partnerships have stretched the limit of partners as they might be required to attend to many meetings at the same time

6.1.3 Cost-effectiveness of Interventions

Based on the project reports and the field evaluation, a number of issues arise concerning the cost-effectiveness of the interventions conducted in the programme. According to the reports of the financial expenditure on intervention activities, a general thread of interventions is observed where emphasis is placed on activities deemed as most significant in propelling specific projects towards the overall goal.

- Raising awareness of the programme, advocacy and mobilization campaigns stands out as a major intervention activity. There was clear evidence that the project staff exert a lot of programme effort and time in this activity. While it can be agreed that a certain level of impact has been realized in this area of intervention, it became increasingly clear that there was a great need to redefine new targets to render these activities more cost-effective. There was evidence of disproportionate efforts through the whole value chain with more effort being put on stove production and unbalanced effort among the stove sellers and consumers causing the cook stoves to stagnate at the points of sale and use. Most stove sellers reported minimal sales of stoves and slow movement of the improved

stoves over the traditional stoves stating that consumers decried the high costs of the stoves and their comfort in using the traditional stoves. In cases where consumers purchased the improved stoves they appreciated the savings they made but they continued to use traditional stoves alongside. Despite research, publications and knowledge being a key strategy in raising awareness and providing evidence based tool for advocacy and mobilization, the funding allocation for this activity have not exhibited very tangible results. Various implementation activities especially proper marketing strategies need to be integrated into the advocacy and mobilization interventions to increase the uptake and use of improved cook stoves at the community levels.

- Training and capacity building is another key intervention conducted in the projects. This can be divided into two distinct levels according to the target audience: the project staff and the various levels of community members (leaders, artisans and various members of the community at large). Value for money is evident in the training and capacity building of the various levels of the community members. This is well illustrated in the success of the school activities, among the members of the charcoal producers association in Sofala and in the training of various artisans and groups in cook stove production. Unfortunately the staff members in network organizations decried the need of training in various aspects that they deemed relevant to increase their effectiveness in the respective positions including issues of biomass and project proposal and report writing.
- Project monies were also set aside for stove production activities. In all projects evaluated, this budget allocation was used relatively well with various trainings and stove production support being put in place as evidenced by the increased production of improves cook stoves. The execution of this particular intervention may need to be revised in some instances to ensure that the whole process of stove production flows in a synchronized manner to avoid the over-production of clay liners as compared to the tin shells thus making the stove production process stall. A situation where the ratio of clay liners matches that of tin shells would improve the cost-effectiveness of this particular intervention.
- Sustainable energy development and planning is a section in the implementation that could encompass contribution of the various projects to national policy development on renewable energy. To a very good extent, this budget item can be deemed to be cost-effective in Ivory Coast, Benin and Togo where communities are leading in developing local energy plans. For effectiveness there is need for a support of project ideas developed from the plans to serve as incentives for the communities. In Mozambique the LEDCs in Sofala have demonstrated their effectiveness through the ability to mobilise communities and develop own local plans and raised resources for their implementation. However other partners

KULIMA and Livaningo are struggling to get this activity off the ground. In Ghana the activity is still to start.

- In the cases of all the countries (Ivory Coast, Ghana, Togo, Benin and Mozambique) great effort have been made towards the development of local partnerships. Major partners cited include the relevant ministries in the government, other international energy players, and local CSOs, CBOs and community groups. Ivory Coast, Benin and Togo have indicated partnerships with various international organizations. Caution should however be exercised especially with the member partnerships established at the community level to ensure that a clear criteria is developed and to reduce the financial overdependence of these members on the country networks.
- In the various programme sites where this has been indicated as a major intervention, the development of micro-credit projects has been very successful. The savings and credit groups are initiated and supported as an entry point into communities for various energy-related issues, including the use of the members in awareness rising in their communities. However the Clean Energy in Africa programme should strive towards encouraging the initiation of more of these community driven groups and revamping their role as platforms for other energy related activities like marketing.
- A major challenge that seems to need urgent rethinking and possibly restructuring to make the interventions cost-effective is the issue of project administration especially in terms of salaries and emoluments paid out to project staff. As was evident in the majority of programmes, the issue of limited funding for salaries influenced staff morale within the Clean Energy in Africa programmes. On a positive note, it was established that programme staff were deemed as skilled enough to be incorporated into other energy-related organizations. However, having a small number of full-time staff resulted in the interventions being run heavily on the backbone of volunteers. While this situation has increased the coverage of the programmes in more communities and availed a good recruitment base among the volunteers, hidden and obvious costs for providing constant training for the volunteers to enable them to function within the programmes may negatively affect the programme budget.

6.1.4 Maintenance and Advancing of Programme Results

The beneficiaries and partners are not well equipped to maintain and advance the results of the programme. In the current set-up, the aspects of maintenance of the programme result lie in:

- the development of skills in stove production among various individual and group artisans

- the development of a business arrangement with stove factory SYTAP in Togo to boost stove production by JVE International
- the sense and advantages of belonging to the regional and national networks – JVE International and FEDESMO

Little effort has so far been put towards the maintenance and advancing of the results of the programme. Several characteristics of the current projects may need to be reviewed in order to ensure that the results of the programme is maintained and advanced. These include:

- with the exception of JVE Togo, there appears to be minimal contribution of the programme activities towards the closing of the huge policy gaps on the government level
- undefined membership criteria that enhances value for money and programme ownership among network members
- the reportedly low momentum for absorbing new members into the networks especially in the case of FEDESMO
- lack of emphasis on resource mobilization by both the networks and the membership levels to ensure uninterrupted and scaling-up of the programme activities
- lack of evidence of incorporation of programme sustainability within some of the current programme activities
- limited emphasis on the development of programme support skills like project management, proposal development, record and bookkeeping

6.1.5 Sustainable Change

The programme has so far contributed to sustainable change in the lives of the beneficiaries and project countries in general. Currently various groups and individual artisans, as well as business people reported making a living out of either producing or selling of the improved cook stoves in all the programme areas. Benefits also extended to the users of improved cook stoves who reported using less charcoal to cook their food thus saving on their daily monetary use on purchase of the same. As this was the case, issues of sustainable change were jeopardized.

Other benefits that were recorded in the evaluation include:

- Skill development among community members in various areas of stove production
- Livelihood benefits determined through support activities including increased income at individual and community levels through the establishment of several solar charging stations,

- Increase in forest cover especially through community partnering with the programme (Adel SOFALA)
- Increase yield in fishing activities in Beira
- Combined use of improved stoves with the traditional charcoal stoves therefore reducing expenditure and consumption of charcoal

Further investigation revealed that although some community members appreciated the benefits of the improved stoves especially in reducing their daily budget for charcoal, the improved cook stoves were considered very expensive to purchase thus out of reach of many ordinary community members. It is however anticipated that with the review of some of the programme activities touching on the cost of the stoves and involving good cooking habits, greater strides can be achieved towards the achievement of positive sustainable change in the energy sectors in the respective communities and countries.

6.1.6 Programme Achievements

Major achievements have been realised by the Clean Energy in Africa programme. Some of these major achievements include:

- Membership drives that have been conducted by various country and national arms of the network have resulted in various positive achievements of the programme namely:
 - Increased numbers in terms of individual and group members and volunteers providing the various programmes with multi-stakeholder expertise. This particular achievement has availed to the programmes a network of professionals sharing in expertise in various fields, as well as providing the networks with a large database of volunteers.
 - Increased visibility of the programme in the various countries of operation and beyond strengthening the impact of JVE International and FEDESMO in the renewable energy sector.
- Sensitization and the creation of awareness among the critical mass in the community on issues of renewable energy.
- Skill development and capacity building among targeted groups and individuals in the local communities in stove production.
- Production of improved cook stoves mainly for household use but also for institutional use. Production of the improved cook stoves is very well established in some of the programmes, especially in Togo that the current production is not limited to the domestic market only, but is actually being exported to other West African countries.

- Reforestation activities are major programme achievements in Mozambique. Implemented in partnership with a local CSO, this activity has seen the planting of vast acres of mangroves in Beira. Not only has this activity achieved increased tree cover, it has helped to check rapid deforestation occasioned by illegal charcoal production, as well as improved fish yields from the nearby Indian Ocean shores.

Several progressive developments so far have given specifically good results and can give encouraging outcomes in the renewable energy sector within the timeframe of the programme. A combination of these approaches within the programme may give a very high level of success in ensuring Clean Energy In Africa.

- The current trend of identifying and working with individuals and groups in the community to build on capacities and expertise in various areas including stove production, livelihood issues including active micro-credit activities may translate in stocking the market with improved cook stoves, ensuring the sustainable use of biomass fuels in the communities as well as impacting on the communities with knowledge, demand for and ability to embrace improved technologies.
- The establishment of partnerships with various ministries in the government setup is a progressive development that can give very good results within the timeframe of the programme. This development contributes towards the drive to actively participate in various aspects of policy development. Influencing energy policy development as key stakeholders and experts within both national and regional structures can significantly contribute to filling in the huge gaps evident in the energy sector and lead to sustainable and renewable energy strategies in the future.

6.2 Programme Opportunities

Several opportunities present themselves for increasing of the programme's impact during the rest of the programme period. It is imperative that these opportunities not only be utilized by the partners, but also by Naturvernforbundet. Specific programme opportunities that unfolded during the evaluation were:

- The large numbers of biomass users who need assistance in upgrading their use to a more sustainable level at household and institutional levels providing the projects with a consistent demand of potential beneficiaries. This ensures a constant and dependable demand of the programme interventions.
- The high levels of political and organizational support that JVE and FEDESMO currently enjoy from respective ministries in the various governments as well as other organizations in the energy sector

(specifically SNV in the case of JVE International and SE4ALL and FUNAE in the case of FEDESMO). These support structures offer opportunities for the networks to grow and to increase their visibility and impact at national and even regional levels. These support systems also provide opportunities for collaboration to produce a database of high professional expertise that can be used to respond to calls for proposals and tender bids.

- Large quantities of studies and lessons that have been generated by the member organizations of the JVE network can create an opportunity for knowledge brokering across regional members making the network a technology hub in issues of renewable energy
- Diversity in network members could provide opportunities for multi stakeholder representation and a large database of volunteers leading to the facilitation of market linkages and professional sharing or joint fundraising. In the case of Mozambique the backlog of members who are interested in joining the network provides such a platform.

6.3 Partner and Network Relationships

One very positive trend among the JVE International and FEDESMO network secretariats, country networks and organizations is their zest to form partnerships and increase membership. Virtually all the organizations boast partnerships with the government, public agencies, and private sector as well as likeminded organizations. According to the evaluation, there exist three distinct levels of relationships in the Clean Energy in Africa programme. These include relationships between

- Major networks (JVE International and FEDESMO) and their partner country or national organizations
- Country and national organizations and the implementing partners who mainly comprise CSOs, CBOs, community groups and individual members
- Country and national organizations and parallel stakeholders including the relevant host governments and supra-national bodies

Evidently, the dynamics of the existing relationships need the incorporation of criteria that incorporates clear roles and responsibilities as well as benefits of each player in order to minimize any risks. For example there seems no clear outline or basis for partnership identification and selection. In order to ensure sustainability of the existing partnerships and relationships, there is need to develop clear criteria which must weigh the cost effectiveness of the collaboration for both partners.

6.3.1 Role of Governments in Programme Implementation

According to the relevant and concerned ministries in the current governments, there appears to be a general goodwill and willingness to work with and support the programme activities in its role of policy development in the energy sector. Various implementation strategies have been delegated to government related agencies namely the Energy Commissions (EC) in all government set-ups, Environmental Protective Agency (EPA) in Ghana and Togo, Directorate of Environment in Ivory Coast and FUNAE in Mozambique. Policy implementation has remained weak and compromised the outcomes of the Clean Energy in Africa programme activities.

Based on the current funding status of the various government agencies, their roles in the programme implementation were varied in each programme area. These included:

- the regulation of power and natural gas sector including renewable energy, licensing of energy players, provision of strategies and national plans on energy use, development of the bio-fuel document, development of standards for cook stoves and the sustainable production of wood fuel (EC, Ghana)
- the development of low carbon framework policies and measures, energy efficient programmes in homes, and the development of the renewable energy act and the use of landfill gas and coal (EPA, Ghana)

Various issues however marred the impact of the agencies in the programme activities including:

- major drawbacks in the gathering of evidence
- advocacy setbacks
- lack of clarity about what is happening in the area of energy

6.3.2 Relationships with Programme Partners

Currently JVE International and FEDESMO have documented working relationships with Naturvernforbundet and various local partner organizations. Significant aspects of these relationships include financial and skill resource mobilization and sharing as well as collaboration in various aspects of programme implementation. Notable aspects of these relationships include:

- Direct and accountable funding from Naturvernforbundet for programme activities.
- Skill and knowledge sharing to improve programme implementation especially at the secretariat levels of the networks. This is done through various knowledge transfer options like technological and technical

- transfer, feedback to programme reports and also through internship opportunities from Naturvernforbundet experts.
- Participatory transfer of knowledge and skills to individuals and a variety of community based groups specifically women and the youth by the networks and country programmes
 - Sharing of technical skills and expertise through various collaborations among members of the networks
 - Sharing of expertise with other locally based organizations

However, the evaluation unearthed a few key issues that negatively affect the network relationships with various partner organizations. These include:

- General feeling of insufficient involvement and participation of the network members in planning, money allocation, decision making, resource sharing at the network levels.
- Need for improved knowledge transfer techniques from Naturvernforbundet to the networks
- Need for a streamlined criteria for the identification of project needs and the assessment and identification of skills upgrading among members of the networks
- Need for clearly defined expertise support linked to specific project deliverable

6.4 Gender and Human Rights Issues

6.4.1 Gender

The programme and projects design are gender blind from the overall objectives to the output levels. There is no specific of the target beneficiaries and they are mostly referred collectively as communities. There is no gender action plan in built into the programme. Gender is at the core of the programme as it targets the extraction and use of natural resources that affecting men and women differently and thus it was expected that this should be developed.

Although the staff of the networks and the volunteers consists of men and women, it is not guided by a pre-planned gender consideration. So the mix cannot be taken as a measure to the extent of gender equality in the networks. The community groups (micro credit and savings and the stove producing groups) are also a mix of men and women. Also it was not by design that there are women in stove production and marketing but naturally.

The programme and projects have different gender impacts and it is recommended that gender action plans be developed from the programme and project level. Training for gender mainstreaming is also recommended for the partners to enable them to cascade the skills and knowledge to the communities they work with. It will also be important that gender be considered in the

operations of the networks for example in terms of composition and decision making on operations of the networks.

Programmes specifically worked with;

- Community based women groups to improve their situation in the production of clay liners for stove production
- Male artisans in the production of stove metal covers
- A combination of both male and female stove sellers
- Boys and girls in educational settings
- Predominately male who represented locally based organizations and government officials
- A good representation of men and women staff members and volunteers

6.4.2 Human Rights Issues

The programme and projects address some fundamental human rights issues. Among the rights that are clearly evident include the right to information on environment, energy and climate change, participation of relevant stakeholders at all levels of programme and project implementation.

- Environmental rights were addressed through various programme activities including reforestation, reduction of carbon emission through the clean energy stove and improved charcoal production.
- Health rights were taken care of in the programme component that embraced production, marketing and adoption of improved cook stoves for household use because of the reduced smoke inhalation.
- The right to be able to engage in a form of livelihood and provide for ones family was addressed by the active participation of community members in cook stove production, sustainable charcoal production, individual and communal solar charging stations as well as the micro-finance groups scattered all over the programme areas.

At community level the use of the community based energy planning and project implementation recognizes the different roles and responsibilities of the community and takes these into consideration. The interventions are identified by the communities and are used as the basis for project funding. The project also relies on use of locally available materials and resources creating local opportunities for income and alternative livelihoods of the communities. Awareness raising is at all levels. This affords the right to information for all stakeholders to enable them to make informed decisions.

At programme level main outcome is an alliance of organizations and communities that are able to push the poverty reduction agenda and sustainable energy solutions. This gives the people the right to associate through networks and be able to dialogue on issues of common interest.

Unfortunately some human rights issues were not met within the current programme interventions that can be attributed to the fact that energy policies in the programme areas are either too weak or none existent. Alarming silence was noted in the following areas that directly affect the protection and promotion of human rights to sustainable and renewable energy:

- Policy aspects that would directly address inequalities in the energy sector.
- Potentially discriminatory traditional practices and biased distribution of power rendering the role and participation of vulnerable groups like women and girls as a weak link in the energy chain.
- Human and ecological abuses occasioned by private investors in the promotion of unsustainable energy solutions through unsustainable deforestation and charcoal production methods.
- Priorities and decisions favouring multinational co-operations and corrupt individuals (law enforcers) over environmental sustainability and peoples' rights.
- The disastrous impact of energy production and use on end-users (mainly women and young girls).
- The catastrophic effects of unsustainable biomass and charcoal production on climate change.

6.5 Lessons Learned, Best Practices and Major Challenges

6.5.1 Lessons Learned

Major lessons learned from the programme so far that can inform the remaining programme decisions and define strategies for expansion, retention, reconsideration and phasing out include:

- i. Biomass energy will continue to be the preferred energy choice among the majority of people within the foreseeable future. Unsustainable biomass extraction and use continues unabated at the expense of the environment from deforestation including countries with and without good energy and environmental policies. There is need to demonstrate more sustainable practices that will serve as evidence to influence policy introduction or change. This can be through the promotion of sustainable and viable renewable energy technologies through effective networks and market led activities.

- ii. Solar energy is an abundant source of renewable energy associated with less environmental effects. The uptake of solar energy technologies remains low and is attributed to high cost of procurement and installation and lack of adequate technical capacity. Micro PV technologies have emerged on the market with the potential of addressing some of the above barriers but lack of information and awareness affect the communities' decision to invest in such options.
- iii. The formation of a comprehensive renewable energy sector induces direct benefits like saving of energy and money. Indirect benefits of the sector include job creation, increase in energy manufacturing and the creation of trade connections, as well as the accumulation of direct value in the sector. This is shown by the development of the improved stove value chain and the solar battery charging facilities which are providing direct and indirect benefits to the stakeholders.
- iv. There is reliance mostly on running projects with single source of funding mainly from Naturvernforbundet. The partners need to be weaned off this source of finance to mitigate their funding risks. Even network members have interpreted their participation in national networks as a way to reaching out to this fund. The programme funding should be used as seed money to leverage additional sources of financing for the networks.
- v. The need for a strong Behaviour Change Communication (BCC) component to increase adaptation to improved energy consumption

6.5.2 Best Practices

Emerging best practices from the programme and projects include:

- i. The use of participatory approaches and identification of viable entry points into communities helped to create sustainable project initiatives. The projects have worked with existing micro credit savings groups and associations especially those on agriculture by complementing their capacity and skills with energy and environment knowledge. It has enhanced ownership of initiatives and generated positive impacts.
- ii. Community energy planning and participation is a valuable lesson that the project has demonstrated particularly in Mozambique and Togo. The CLED model is a bottom up approach offering communities the first opportunity to participate, identify challenges and map solutions to their development challenges.
- iii. The working model of the network is driven by volunteers and often these are driven by own personal defined values and it creates win - win situations for the volunteer and the network. It provides opportunities for

- on job learning and skills that have helped the volunteers get the work experience demanded by potential employers. The cost benefit of such approaches and leveraging local level capacity is highly commendable. Large network membership drawing upon skills and knowledge from a diverse base and increasing voice of poor communities.
- iv. The model for information education and communication on environmental and energy issues has generated positive impacts in all the countries. It can be noted that there are few countries with energy and environment taught as a subject in schools at all levels. Given the barrier of changing education curricular, the projects started introducing the subject through extracurricular activities. Environmental clubs, private schools as opposed to government school which take time to make decisions were some of the innovations used.
 - v. The use of private public partnerships in creating green enterprises is an innovative approach that leverages private sector funding. This is the case for the SYTAP model in Togo that was formed as a special purpose vehicle for Togo and is involved in commercial stove and marketing.
 - vi. Emerging lessons from the pilot projects particularly where the benefits can be linked to national development can be used as effective tools for policy advocacy and influence. The example of the Nhangau mangrove rehabilitation in Mozambique is a clear example of influencing policy and practice on deforested mangrove areas.

6.5.3 Major Challenges

- i. Unsustainable biomass extraction and use continues despite the existence of policies in some instances. Where there are lack of policies the partners have not actively engaged with the relevant authorities to effectively address sustainability issues with biomass extraction and use. There is lack of concrete examples of interventions that have demonstrated the impact of methods so far adopted and used by the projects.
- ii. The funding risk mainly due to exposure to financing from a single source by the partners is not being prioritised as a matter of urgency and redress. Most projects are yet to strategise beyond Naturvernforbundet's programme's implementation period. The inability to attract funding will greatly affect the implementation and expansion of some interventions activities.
- iii. To expand the networks beyond their size and programme of activities it is incumbent upon the partners to innovate with new value activities for members. The networks should develop guidelines that specify the benefits of being a member and the clear expectations of both parties to avoid creating expectations of financial reward as a membership incentive.

This challenge in the case of Mozambique resulted in the hindrance of membership registration leading to low membership numbers.

- iv. Lack of technical skills in various programme areas specifically energy issues among programme staff. This was evident among staff members in Ivory Coast and Benin who were more versed with knowledge in climate change. Mozambique on the other hand claimed little knowledge of issues related to biomass. Other technical skills that were identified for slow progress especially among the staff in Mozambique included project proposal writing, fundraising, project monitoring and evaluation, as well as proper reporting skills.
- v. Poorly defined organizational strategies for fundraising, communication, marketing, reporting, monitoring and evaluation at both the network and member levels, with the current emphasis being more focused on activities rather than on strategy. The existing strategies are not systematic, interrelated and defined well enough to provide consistent and detailed feedback to the programme implementation activities. For instance the number of beneficiaries of the improved cook stoves or even the solar lamps has currently not significantly impacted on the redefinition of the existing communication and marketing strategies.
- vi. Poorly defined training needs identification to inform capacity building for programme staff that has affected morale, sense of ownership and has even led to instances of high turnover of programme staff.
- vii. Other challenges include the ability of JVE International and FEDESMO to ensure good governance and practice transparency, accountability in resource sharing to the network members who questioned their limited involvement and participation in the resource allocation process
- viii. In the area of policy and advocacy, a strengthening of the biomass extraction and utilisation needs to be re-emphasized and worked upon to improve the programme strategic outcomes. A clear advocacy strategy needs to be developed by all countries that will help to ensure that charcoal production and utilisation remains sustainable and beneficial to the poor communities. It can be shown in all countries that the rate of charcoal extraction and use is continuing. Whilst policy changes will be desirable, this will be difficult to achieve under the remaining 2 years hence an advocacy plan needs to be put in place as opposed to actual policy change. Biomass extraction and use has been regarded as a political hotbed and thus one would risk their reputation if they challenge the policy status quo.
- ix. Technology use and adoption especially on charcoal has been low. A number of issues have been raised as bottlenecks to technology adoption and use. One is the cost of the technology that has not been affordable to the poor charcoal producers, also issue of tenure of the charcoal fields

(they belong to highly influential individuals) and they are paid an incentive for the number of bags of charcoal produced. There is need for more market driven approaches to the introduction of sustainable charcoal production methods that are cost effective and acceptable to the charcoal producers. The grouping of charcoal producers into an association is a good lesson that can then be used as a platform for wider dissemination of the technologies. Market driven approaches need to be enhanced in the stove production and dissemination and also promotion of solar system. Stove production in Togo, the SYTAP model for development of green enterprises is a model that can be up scaled by other countries.

6.6 Analysis

This evaluation further subjected the findings to five essential evaluation criteria (relevance, effectiveness, efficiency, impact and sustainability) in order to fully embrace the success of the current programme activities.

6.6.1 Relevance

All the partners' overall aim and project objectives are consistent and complementary with the energy and environmental and development policies of the governments of Togo, Mozambique, Ghana, Ivory Coast. They are also made in line with Naturvernforbundet's development and cooperation strategy. The projects fit into Naturvernforbundet's Clean Energy in Africa programme, with the stated intent of "ensuring that access and extraction and use of natural resources or energy benefit the poor and is within nature's tolerance".

The project particularly supports the SE4ALL initiative and its target of universal access by 2030. The programme focuses on ensuring economic, social and environmental sustainability of extraction and use of biomass resources that also promotes local economies. It also encourages local networks to work as voices to share and participate as a right to environment. This project is highly relevant to the needs of the population in the countries. The projects use a community based approach for programming and as its main planning tools. In this approach emphasis is placed on the roles and responsibilities of different actors in relation to actions necessary to realize basic human rights.

Biomass is the primary fuel in Africa especially for household cooking particularly among the poor. The number of biomass users currently stands at over 1 million making the Clean Energy in Africa programme very relevant. Sustainable extraction and utilisation of biomass has value added benefits to environmental sustainability through the avoidance and reduction of deforestation, slowing down the effects of climate change, income generation and health benefits all of which are relevant to the programme. Cultural norms and practices as well as poverty reduction strategies in the target countries are also very closely linked to improved access to energy services thus making the programme relevant to countries' national development agenda.

The Clean Energy in Africa programme works towards supporting the creation of an enabling environment that has the potential of impacting a wider audience through policy and practice change. While some of the countries lack energy policies in totality and others have them in draft (e.g. Togo) and where policies exist (e.g. Mozambique), the implementation and practice are weak. Lack of awareness and knowledge of laws related to energy, particularly those touching on forestry and charcoal, were reported among the poor, who are among the producers and also users of the resource. Charcoal extraction regulations, where they exist, are wantonly ignored, e.g. Mozambique, Ghana, Ivory Coast.

The choice of the countries is also relevant as shown by the serious environmental challenges in all the countries. 80% of the population relies on biomass to meet its cooking needs. The target countries are faced with a challenge in which natural resources are being unsustainably extracted with little or no benefit to the majority. These resources include firewood for cooking and making charcoal

6.6.2 Effectiveness

Although the projects were effective to the extent that they addressed the core business of the programme, sustainable extraction and utilisation of resources that benefit the poor, they fell short in a number of issues that would have increased their effectiveness.

- Reporting and approval of proposals is a weakness on the partner side. This is resulting in slow start to projects.
- Challenges occasioned by the quality of stoves unfortunately slowed down promotion activities in Mozambique, affecting the effectiveness of the programme.
- Upscaling of community based planning in Mozambique did not go well due to lack of technical capacity and skills in implementing it resulting in consideration of dropping it.
- Reporting and development of proposals is a weakness on the partner side that affects effectiveness. This has frequently resulted in slow start of some project activities. FEDESMO admitted exceeding deadlines for the submission of project documentation resulting in delays in programme implementation.
- Challenges occasioned by the quality of stoves unfortunately slowed down promotion activities in Mozambique, affecting the effectiveness of the programme.
- Community based planning in Mozambique did not also go well as planned resulting in the consideration of dropping it altogether.
- High levels of effectiveness was very evident in Togo Having established the production of high quality stoves that are widely recognized within the region and beyond, JVE Togo in conjunction with SYTAP has started to institute a factory to standardize the production of quality of cook stoves.

- Effectiveness was also very evident in the community supported reforestation in Beira, Mozambique

A major issue affecting effectiveness of the Clean Energy in Africa programme is the fact that the marketing and communication strategies for the programme in both network secretariats do not appear to be well established because the uptake of improved cook stoves by the end users still stands visibly slow in some areas. Well defined and planned marketing and communication strategies will ensure a widespread consumption of the output of the programme activities (cook stoves, reforestation campaigns and even sustainable renewable energy). Promotion of stoves was hindered by low quality due to poor clays and lack of skills. This is being addressed and the promotion activities will be addressed in the next phase of the projects. Knowledge management including the packaging, management and dissemination of knowledge is weak in both networks. Further to this, knowledge sharing between the different network members is not structured and well designed, having serious implications to the overall effectiveness of the networks. Communication among network members should also be driven by clear communication strategies that enable the members to share knowledge with each other. In JVE, communication even between country representations was weak, reducing the opportunities for them to learn from each other in various areas of operation. On the other hand KULIMA and Livaningo seem to enjoy a very close working relationship with clear communication channels, increasing the effectiveness of their projects. Unfortunately the same cannot be said about network communication and knowledge sharing between the KULIMA and Livaningo duo and their network partner ADEL Sofala.

6.6.3 Efficiency

Annual and semi-annual work plans, financial and progress reports are regularly provided to Naturvernforbundet. Government authorities do not accompany project staff during supervision visits, as their budget is limited and they do not have transport means to go on sites. A real effort is made by the project staff to explain all the aspects of the project to all stakeholders.

The logical framework is mostly used when making half yearly and annual reports to Naturvernforbundet. It would have been effective if it was utilised during project implementation to check on the validity of the assumptions and checking progress towards indicators. Different tools, such as monthly work plans and financial statements, allow having a good view on the activities of the project on the various sites. Submission of reports has not been very timely all the time, affecting efficiency in requesting for subsequent funding and programme outputs.

Especially in Mozambique, the partners were not keen on expanding the networks to include new membership as they feared they would dilute the share of funds available. There is a perception by partners in Mozambique and West Africa that they are not adequately funded and hence the efficiency of project

delivery is compromised. Benin, Ivory Coast and Togo have managed to raise own funds and this has helped them to recruit more staff and have more projects for implementation.

There is lack of clear cut strategies for capacity building within the network making the networks limited in their capacity to deliver on their mandate thus reducing on efficiency. Training new members to understand the project and appreciate the implementation model has been slowing down implementation e.g. in Ghana

Efficiency is also affected by lack of clear cut strategies for capacity building among network members limiting their capacity to deliver on their mandate. Ironically, the network members do not engage frequently in the exchange of knowledge and expertise. The constant training of new members, although an advantage to the networks, was also considered to slow down project implementation by some implementing members. KULIMA is considering dropping the Community energy model which incorporates project implementation through community based entry points due to lack of skills among the community members.

6.6.4 Impact

A major significant impact of the programmes was that local communities in the programme areas had seen their roles in various aspects of the energy sector reinforced. The communities have shown positive mobilization in favour of the programme through their active participation in programme activities and also through their adaptation of the improved technologies (improved cook stoves and solar panel lighting and charging activities. According to these end users, they have benefited immensely because now they spend less on fuel (charcoal) and are able to charge their mobile phones more conveniently and cheaper. Other success stories came from the community driven LEDCs who were involved in mangroves plantations in Nhangau, the Charcoal Producers Association, and the Ceramica project in Mozambique, where it was evident that the communities are taking programming and ownership of the project and processes. In West Africa, similar processes of the involvement of community based groups showed active participation and benefits to the members and the surrounding communities.

The mobilization of individual and group membership into the programmes must be mentioned as one of the most successful strategies of increasing the impact of the programmes. Without fail, all network members have been able to attract membership to boost their visibility and also to impact wide areas within their communities. Membership has been drawn from local groups and organizations, individuals and even schools and learning institutions. Currently JVE Togo is leading with the number of members registered. Mozambique unfortunately reported a freeze in membership recruitment occasioned by insufficient funding.

In addition to the positive impact at the community level, linkages have been made to key government ministries as well as related agencies and institutions in

both West Africa and Mozambique by the networks. These linkages have so far increased the visibility of the network members and provided them a platform to be involved in and influence energy related policy. At organizational level, linkages made between the network members and other formal organizations and the media have resulted in their participation in related national and international campaigns and also gone a long way in increasing the impact of their activities in renewable and sustainable energy.

Despite the successful impact in the production and marketing of improved stoves and the ensuing impact in sustainable renewable energy, challenges in standardization of stoves have been experienced among some network members. This has subsequently affected the impact of the programme among these members. Stove production in Togo has been standardized to very high quality to the point where Togo in conjunction with SYTAP has gone ahead and tapped the export markets for their stoves. Standardization and quality has however been a challenge for some of the other network members who still working at standardizing their stoves. KULIMA in Mozambique for one reported dedicating a full year of programme duration working on improving stove quality.

Impact has also been affected by the demand and supply aspects of marketing of programme products including the improved cook stoves, the casamance kilns and the solar panel systems. While the supply side has been maintained at a remarkable pace, the demand side is facing challenges of relatively high product prices and increase in adaptation to the new technology. However, the solar panel systems, though comparatively fewer in the community have recorded very high adaptation and impact due to the immediate benefits enjoyed.

The charcoal value chain is probably the area of impact that needs urgent attention. It was evident that not much effort was being put into developing or enforcing policy to ensure sustainable charcoal production, transportation and use thus affecting the impact of Clean Energy in Africa programmes.

6.6.5 Sustainability

There is potential for project sustainability but this can be scaled up once the current issue of resource mobilization is addressed to ensure sustainability beyond Naturvernforbundet support. Emerging sustainability issues include:

Environmental sustainability: The successful reforestation of the mangroves at Nhangau and community gardens at Ceramica in Mozambique is examples of environmental sustainability created by the communities. These activities have achieved increased tree cover, helped to check rapid deforestation occasioned by illegal charcoal production, as well as improved fish yields from the nearby Indian Ocean shores. Up scaling sustainable charcoal production by introducing more efficient kilns and also promotion of improved cook stoves has the potential to achieve environmental sustainability. However the number of technologies disseminated is still low.

Economic Sustainability: The project has created income and job opportunities for a number of beneficiaries through energy service provision. There are enterprises setup to produce and market stoves and there are enterprises for battery charging services. The projects have developed different business models that ensure that services are paid for. These payments provide an income to energy service provider and also to meet the maintenance costs of the equipment.

Technical sustainability: The demonstration projects have served to provide a better service to the communities including improving their incomes. To the government and other NGO's the projects have provided lessons from the practical demonstrations. Training and capacity building delivered enhances project sustainability and this was achieved through two distinct levels according to the target audience: the project staff and the various levels of community members (leaders, artisans and various members of the community at large). The project facilitated the development of critical mass of men and women with technical skills and expertise in stove production at individual and group artisan level and among the community members.

Social sustainability: Growth of networks enhances social sustainability as the networks have the opportunity to draw upon the knowledge and skills of a large pool of members. There is mutual benefit between the partnerships that has cemented the relationship between the parties. LEDCs have integrated issues of energy, environment to include health that has projected their images beyond an environment institute. They have helped those living with HIV and AIDS through engaging in community based care and also enhancing nutrition through growing of herbs and vegetables. The micro credit and saving clubs and the associations have provided loans to members during times of problems either to pay for school fees or meeting funeral expenses.

The working model of the network which is driven by volunteers with own personal defined values creates win - win situations for the volunteer and the network. It provides opportunities for on job learning and skills that have helped the volunteers get the work experience demanded by potential employers.

Political Sustainability: The high levels of political and organizational support that JVE and FEDESMO currently enjoy from respective ministries in the various governments as well as other organizations in the energy sector (specifically SNV in the case of JVE International and SE4ALL and FUNAE in the case of FEDESMO) enhances political sustainability. These support structures offer opportunities for the networks to grow and to increase their visibility and impact at national and even regional levels.

Programme sustainability: With the current lack of diversity of funding bodies, it is unfortunate that both JVE International and FEDESMO are deficient in clear strategies for resource mobilization which is a great threat to sustainability.

7.0 Conclusions and Recommendations

7.1 Conclusions

Energy efficiency and renewable energy hold tremendous potential to reduce Green House Gas (GHG) emissions, reduce energy costs, create long term sources of revenue, improve energy security and enhance gender equity. However in the absence of clear articulated national clean energy standards and/or transparent processes (or other national standards that mandate training of relevant skills, issuance of permits, advocacy and creation of awareness, etc), renewable energy in Africa has continued to face formidable obstacles and persistent fragmentation. In the case of the programme areas, this fragmentation has increased the cost of implementing renewable energy activities. Fragmentation has also increased the levels of complexity within the energy sector as each stakeholder appears to operate under different rules and regulations. It is therefore imperative national standards make provision for governments to work closely with their private-sector counterparts and the international community to move issues of renewable energy forward.

In the aspect of programme implementation, one can conclude that the current programme activities are indeed in line with the overall goal of Naturvernforbundet's Clean Energy in Africa programme. However, while the current emphasis has been on product development, a steady balance must be sorted between the technological aspect of the programme and the development of various supportive pillars to ensure that the overall goal is achieved at the close of the programme in 2016. Prominence must be given to activities that up scale supportive energy policy, end-user education and uptake and resource mobilization at all levels to ensure sustainability.

7.2 Recommendations

The following recommendations are provided to Naturvernforbundet and the programme partners to influence the policies and decisions of governments:

- Leverage funding to sustain network activities beyond Naturvernforbundet funding is critical for the networks. Financing from Naturvernforbundet should be used as seed funding by the networks to leverage additional funds and also diversify the resource base. Partners must put in place strategies for fundraising. Among such strategies include joint proposal development among networks and leveraging of skills and experience when bidding for consultancy work. The development of public-private partnerships is also ways of leveraging funding for the networks. Skills training to write project proposals are recommended.
- Evidence based policy advocacy enhances the credibility of advocacy strategy and proposals. The projects will need to strengthen the element of policy advocacy aimed at creating an enabling environment that promotes the sustainable extraction and use of biomass.

- The schools education programme has been demonstrated as a cost effective way for addressing environmental education and information to young school children. Up scaling this approach would be recommended for this programme through the use of environmental education as an extra curriculum activities to increase school environmental awareness.
- Increased education of the general public and local governments about energy issues; the collation and packaging of lessons from the projects and programme that could be used for cross learning across networks and other international audience should be enhanced.
- Apply sustainable market driven approaches in the promotion of improved clay stoves by addressing the bottlenecks of quality, adequate stoves to satisfy demand and promotion actions.

8.0 References

ADEL Sofala, 2012, *Bi-Annual Progress Report 2012-2013: Sustainable Energy Activities in Local Areas of Sofala II*

ADEL, 2013, *Project Report 2013*

FEDESMO 2012, *Project Report 2012*

JVE International, 2012, *Project Report 2012*

JVE International, 2013, *Project Report 2013*

JVE Togo, 2012, *Project Report 2012*

KULIMA 2012, *Project Report 2012*

KULIMA, 2013, *Project Report 2013*

Livaningo, 2012, *Project Report 2012*

Livaningo, 2012, *Project Report 2013*

Naturvernforbundet *International Strategy for Naturvernforbundet 2011-2020*

Naturvernforbundet, *Goal Hierarchy for the Clean Energy Programme Plan 2012-2016*

Naturvernforbundet, 2013, *Cooperation Agreement 2012-2016: Progress Report 2012*