Renewable Energy Empowerment in Sierra Leone

Sponsored by:

CLIMATE AND DEVELOPMENT KNOWLEDGE NETWORK – CDKN

Implemented by:

The Environmental Foundation for Africa – Sierra Leone

In partnership with:

Ministry of Energy

Environmental Resources Management Foundation (UK)

Njala University

Government Technical Institute

Final Report

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Contents

Executive Summary

This primary intention of the Renewable Energy Empowerment in Sierra Leone (REESL) project, was to make urban and rural communities in Sierra Leone more resilient to the consequences of climate change and contribute to their social and economic development by exploring innovative ways to introduce renewable energy, especially in rural off-grid settings.

The CDKN Innovation grant awarded to EFA, created a range of opportunities to build on existing initiatives and policies in Sierra Leone. The REESL project added value to the ongoing renewable energy activities being undertaken by EFA and its partners, through establishing some first base line survey results on current energy needs, practices and challenges in a range of communities, representative of the different socio-ecological regions of the country. This base line information will be vital for the future strategic interventions to introduce the appropriate renewable energy solutions for specific situations in community households, small enterprises, social facilities and infrastructures.

The REESL project partners – EFA, ERM Foundation, Government Technical Institute, Ministry of Energy and Njala University – accomplished much during this six month project. In addition to conducting a nation-wide survey on renewable energy applications in Sierra Leone, the REESL team established a database of relevant stakeholders, contacts and potential partners in Sierra Leone and abroad; identified opportunities for future partnerships; developed a workshop methodology; generated a range of resource documents educational materials and tools for posting to a project database on the EFA and other relevant websites; produced a communication strategy that guided a Ministry of Energy-led nationwide publicity about the CDKN-supported initiative through various media – radio, TV and newspapers. The team, which included international partners and resources persons based in Ireland, The Netherlands, South Africa and the United Kingdom also did all of the background planning for a two-day 'Innovation Workshop and Energy Fair' held at a purpose built facility established by the Environmental Foundation for Africa, to promote learning about biodiversity, renewable energy and sustainable development in Sierra Leone.

All of the above activities generated key information that could now serve as useful resources for further development of evidence-based energy policies at various levels in the country. The project extended the knowledge base of the nation-wide sample survey, with an inventory of pioneers, early adaptors, opinion leaders, policy makers and experts from the various groups of key players that are involved in the energy sector

It is particularly noteworthy that the project, through the two-day multi-stakeholder workshop found innovative ways to bring representatives of the groups of key players in the country together to: test the sample survey results; articulate the demands of various stakeholder groups (government agencies, private sector, NGOs, communities and academia); identify more precisely what each stakeholder could bring to the table; match supply and demand for specific renewable energy solutions; explore the most effective ways to generate stakeholder participation in the further introduction of renewable energy; and most importantly to formulate a roadmap for those strategic interventions that will further strengthen the introduction of renewable energy.

One key outcome of this process is the establishment of a network of fifty Renewable Energy Ambassadors from the various stakeholder groups, who have made initial commitments to spread the word about renewable energy in their constituencies, specifically about the benefits, the opportunities and the concrete way forward. It is with this group of stakeholder representatives, the EFA and the other REESL partners seek to work with in the future, to expand the knowledge base about RE applications in Sierra Leone, and to be key contributors to the formulation of RE policies as well as their implementation and monitoring in the year to come.

The Background Context

Sierra Leone

Sierra Leone is considered by the UN classification as a Least Developed Country (LDC) with significant inequality in income distribution among its people. After two peaceful transitions of power, following a decade of conflict [caused by decades of mismanagement and fuelled largely by mineral resources exploitation], there has been steady economic growth and increased foreign investment, during the past decade. Since 2009, the discovery (or rediscovery) of mineral deposits, notably iron ore and oil,[1] has propelled the issue of responsible and transparent management of the country's mineral resources towards the top of the development agenda. Sierra Leone now stands on the verge of an unprecedented period of economic growth[2] driven primarily by revenues from large-scale iron ore mining.

These positive economic indicators have instilled a new sense of stability, development and progress. Yet Sierra Leone continues to face many governance and developmental challenges, especially energy poverty. Concerns also abound, about the environmental problems arising from the pressures of a steadily rising population, increasingly expanding mining operations, growing domestic fuel demands (firewood/ charcoal production), slash and burn agriculture, illegal fishing and poor waste management.

Agriculture is the largest sector in the Sierra Leone economy, employing more than 75 percent of the labor force and contributing between 35 and 47 percent of GDP. Production of the staple food crop, is done mainly by small-scale subsistence farmers, in cleared primary / secondary forests (upland) or in swamps, under rain-fed conditions. Deforestation is accelerated as trees are cut down to clear land for farming, or to provide timber for construction / furniture and firewood / charcoal to sell on to the growing urban market. In recent years, the newly emerging bio-energy market has led to the transformation of thousands of hectares or arable land into oil palm and sugar cane plantations.

[1] In September 2009, Anadarko Petroleum Corporation announced the discovery of commercially viable offshore oil on theSierra Leone-Liberia basin. In November 2010, the company also announced a deep-water discovery at the Mercury exploitation well. As of April 2013, the GoSL had awarded a total of eight oil blocks to eleven companies in a competitive bidding process.

[2] Real GDP growth in 2012 increased to 15% after expanding by 6% in 2011, due to the commencement of iron ore production while non-iron ore GDP growth was 6.3%. Projected GDP growth estimates for 2013 are 25% (non iron ore growth is 8.3%), for 2014 it is 14.15 (7.9%) and for 2015 12.1%t (7.0%). See World Bank, 'Draft PAD Sixth Governance Reform and GrowthCredit', May 2013.

Climate Change in Sierra Leone

Currently Sierra Leone does not have a climate change policy. In 2006, the Government of Sierra Leone completed its Initial National Communication (INC), and in 2008 developed the National Adaptation Programme of Actions (NAPA). It identifies a total of 24 priority interventions in sectors that are considered vulnerable. One of the priority projects is to promote the use of renewable energy (solar energy) and improve energy efficiency and conservation of energy resources. The Government's objective is the sustainable exploitation and the efficient use of the country's renewable energy resources and power production in order to improve the quality of life of the people.[3]

Energy in Sierra Leone

Energy poverty is a major impediment to human development in Sierra Leone, especially in the rural areas. While some progress has been made towards enhancing energy provision (mainly lighting) in urban areas, energy access and availability remains poorly developed outside of the city. Because the majority of the population resides in the country-side, access to the major hydro-power grids represents an enormous challenge for the government. Over three quarters of Sierra Leone's rural population are currently without access to conventional electricity, thus have no option but to use kerosene, candles, or battery powered LED lamps ('Chinese Lamps') for lighting and firewood for cooking.

Women and children spend many hours each day in search of firewood, time which could be spent more productively. In the case of children, valuable school time is sacrificed to the search for firewood and water to make survival possible. Because lighting homes and schools in rural areas is prohibitively expensive, adults and children alike, cannot use their evenings for learning and personal development activities. As in any non-electrified societies, life is defined by the sun, and little is accomplished once it sets around 7 p.m. and as children normally help with domestic chores during daytime, little chance is left for them to study.

Recognizing the importance and urgency of energy challenges, the United Nations General Assembly declared 2012 the International Year of Sustainable Energy for All (SEFA).
SEFA seeks to achieve three key objectives by 2030: (i) encourage universal access to modern energy services, (ii) double the global rate of improvement in energy efficiency, and (iii) double the share of renewable energy in the global energy mix. Sierra Leone is being considered to become one of the pilot countries of the SEFA initiative.
In Sierra Leone, UNDP and UNIDO are co-leading the support to the implementation of the SEFA initiative. As part of the process for the selection of potential first-movers, a mission was received in early June 2012 from the EU and UNDP to assess Government readiness and commitment to the initiative.

The provision of energy is vital for the realization of sustainable economic growth and human development. However, figures on energy consumption, production and challenges to access are rather outdated and do not reflect the present state of energy availability and use in the country.

Sierra Leone is reasonably well endowed with energy resources particularly biomass energy, hydroelectricity and solar energy. There is an extensive network of rivers and tributaries that provide a large hydroelectric power potential conservatively estimated at 1,200MW. These resources can play a catalytic role in sustaining Sierra Leone's development. In terms of renewable energy, Sierra Leone has

[3] http://www.preventionweb.net/files/25782_sierraleone.pdf

hydro capacity of 1 200 MW in over 20 rivers; in addition micro-hydro capacity. More than 85 percent of the energy used in the country is from biomass, limited use of agricultural wastes estimated at 0.7 tonnes a year. The remaining 15% is supplied by crude oil and its by-products. Solar radiation (1 400- 1 800) KWH/SQ M per year is virtually untapped.

Renewable Energy Empowerment in Rural Sierra Leone (REESL) Project

The REESL project was designed to be an innovation process, involving national-level gathering of data on the availability and applications (plus socio-economic implications) of innovative renewable energy (RE) technologies in Sierra Leone. Recognizing that the knowledge, expertise and experience needed to develop National Policy regarding RE in Sierra Leone is currently fragmented between various stakeholders, the project set out to accomplish the following

- Established a Renewable Energy Knowledge Data Base;
- Testing of the Knowledge Base by public, including experts through an Innovation Workshop and Renewable Energy Fair;
- Engaging policy and decision-makers to increase support and investment for RE innovation in Sierra Leone.
- Dissemination of RE information and knowledge.

Through implementing the above activities, the REESL project sought to address the following CDKN overall thematic priorities:

Climate compatible development strategies and plans:

In this regard, the REESL team engaged local, national and international stakeholders and used innovative processes to develop a knowledge base of relevant information. It is envisaged that information will contribute meaningfully to the evolution of national regulations governing the development of renewable energy technologies in Sierra Leone

More specifically the project also intended to assist with establishing an effective platform for addressing the following CDKN African thematic priorities:

- **Climate compatible development policy and programmatic change**
- **Improve access to clean energy solutions in Africa**
- **Strengthening African institutional capacity for implementing climate compatible development:**
- **Supporting African leadership in climate compatible development research and practice:**

The Environment Foundation for Africa and Partnership Outcomes

EFA is the holder and main partner of the CDKN Innovation grant responsible for project management maintaining contact with CDKN, coordination of knowledge base development and outreach

Established in Sierra Leone as a non-governmental organisation since early 1990s, the EFA envisions - environmental sustainability, poverty reduction and people empowerment in Africa.
EFA's mission is to conserve and protect the richly bio-diverse and threatened ecosystems of West Africa, to restore degraded environments, empower local communities and contribute to poverty reduction through environmental education, advocacy, provision of access to renewable energy,

promotion of ecotourism development and sustainable natural resource management.
Since its inception the EFA has worked with local communities, development partners, governmental agencies and other key stakeholders to undertake national-level environmental education and awareness raising programs, land restoration, protected area management and community empowerment initiatives in Liberia and Sierra Leone. EFA has also coordinated a network or environmental organisations and activities in West Africa (through the Green Actors of West Africa Network – www.greenactorswestafrica.org),
Today, capitalizing on its wealth of experience, EFA is working closely with the Environmental Protection Agency of Sierra Leone, to develop and implement a national strategy for environmental awareness and sustainable development education. Through its current project involving the installation of solar energy devices in forty-nine communities across four districts in south-eastern Sierra Leone, EFA is laying solid foundations for improving community livelihoods and alleviating poverty, while promoting environmental sustainability in rural communities.

The existing partnerships with the Ministry of Energy, Environmental Resources Management Foundation (supported by the Environmental Resources Management Firm), Government Technical Institute and Njala University, established through the REESL project, have assured a successful delivery of this project where:

The Ministry of Energy:-
-Peer-reviewed all deliverables to ensure they were demand-led and in alignment with national priorities;
-Led the development and implementation of the communication strategy for the project and give wide national coverage of the CDKN-sponsored initiative;
-Provided regulatory oversight and guidance of the project methodology;
-Assured relationship building and knowledge sharing within the Ministry;
-Enable high level participation of the Ministry in the Innovation Workshop;

Njala University
-Conducted the desk research of all current reports and documentation to identify relevant policy and other initiatives related to Renewable Energy applications in Sierra Leone;
-Coordinated community surveys and data analysis to assess the RE potential of communities in representative regions of the country including areas of high biodiversity;
-Supported capacity development of project staff in research methods;
-Contributed to refinement of the innovation workshop methodology and facilitation of the workshop;

Environmental Resources Management Foundation
-Coordinated development of the workshop methodology and preparation of workshop materials; -Supported designing of the project database and dedicated webpage for all the project documents generated.
-Led engagement of the private sector in Sierra Leone and internationally, to ensure opportunities for innovation are identified and fully availed of, including the sourcing of RE equipment for exhibition;
-Conducted capacity building workshop to prepare the project team for hosting of the innovation workshop;
-Led facilitation of the workshop, including engagement of high level international facilitators;

-Coordinated recording and analysis of the workshop proceedings to enable compilation of the ROADMAP and assure effective communication of the project documentation and the lessons learnt.

Government Technical Institute

Undertook the fabrication of RE prototype devices (solar food drier, solar water heater, bio-digester) for exhibition at the energy fair.

The Rural Energy Activating Livelihoods (REAL) Project

This is a 3-year European Union funded project being implemented by EFA in partnership with the UN Food and Agricultural Organisation and the NGO Energy for Opportunity. The goal of the REAL project is to improve the quality of livelihoods of people in remote / off-grid rural communities in the south-eastern region of Sierra Leone, through access to renewable energies. This involves the provision solar PV installations to social facilities in the target communities – schools, clinics and charging stations; building capacity in solar technology through basic and advanced training programs; enabling access to micro-finance schemes to support income generation projects and small enterprises, and supply householders with opportunities for investment in solar home lighting products.

The REESL project, was inspired by the ongoing Rural Energy Activating Livelihoods (REAL) project, which focuses on the installation of solar PV systems in selected rural communities in four districts. While the REAL project provided the human resource bases for national survey, the survey process enable the staff of REAL to gain a broader overview of the wider implications of energy poverty in the rural context and the opportunities that exist to improving the livelihoods of communities through creating access to a range of clean energy options. Furthermore the wide range of national – level information generated by the REESL project will inform broader policy issues on RE in Sierra Leone with potential implication for all RE-related activities in Sierra Leone, including the REAL project. Furthermore the Innovation Workshop and Energy Fair, provided an opportunity for all the REAL project staff to meet with and learn from various practitioners in the various sectors, and through this, enhance their appreciation of the importance of energy for rural development in the current context of Sierra Leone.

The Biodiversity and Energy Learning Center

What is it?

The establishment of a Biodiversity and Renewable Energy Learning Centre near West Africa's only coastal montane forest – [the Western Area Peninsula Forest (WAPF), situated about 15 km south of Freetown the capital city of Sierra Leone -] was established to promote learning about the threats to nature. Its main goal is to establish a platform for communicating to the public about sustainable natural resource management, with a clear focus on developing and promoting an interactive learning approach to biodiversity conservation and renewable energy applications in the Upper Guinean Forest region. The centre is also set up to provide to educational materials, tools and techniques, related to the above themes with ample opportunities for practical demonstrations on their wider applications.

Given its focus on education and information dissemination, EFA has been working closely with the national educational and schools systems, the appropriate government ministries, in particular,

Forestry, Education, Local Government and Energy & Water Resources. EFA has also engaged actively with other stakeholders in the voluntary and private sectors, focusing primarily on strengthening the existing partnerships with entities promoting access to and use of renewable energy in Sierra Leone and elsewhere in Africa, will be further strengthened.

How did it come about?

EFA started conservation work in the WAPF area in 1996, with a tree planting project in Lakka Village (funded by the British High Commission in March 1996) and the creation of the Peninsula Action Group for the Environment (PAGE) in March 1997. These developments were disrupted by the escalation of civil strife in Sierra Leone in May 2007, but operations restarted in July 1999, with the launching of an IUCN funded project - *Freetown Peninsula Environmental Awareness and Education Programme*. This 2-year small grant project, which targeted 10 communities along the WAPF enabled EFA to conduct the first series of assessments that gave a clear indication of the impacts of the increased population pressure on the capital caused by the civil conflict and the consequences for the WAPF. By the end of the conflict in 2001, EFA recognized the urgent need to maintain an educational facility near the forest reserve that showcases the importance of nature conservation for the local communities. This resulted in EFA establishing the linkages with some of the communities, through environmental education outreach programmes. Subsequently a 15-acre plot was acquired in 2002, to establish an educational centre.

Lessons from the first major event

On of the main features of the facility is that it is an interactive walk-in center with a conference / exhibition hall that can accommodate up to 150 participants. Being the first official public event held at the learning centre, the REESL Innovation Workshop provided an opportunity for EFA and its partners to test the facility as a conference venue.

Early feedback from the staff and workshop participants indicated that the centre is unique. The setting of the venue allowed for good participation and engagement of everyone. The arrangement of the venue allowed for the use of different areas of the building for break out sessions, exhibitions, art / cultural performances, relaxation and other ancillary facilities.
It is noteworthy that although EFA worked hard to make the facility functional and ready to host the workshop, there is still some work to be done, before the learning centre fully complete.

Main benefits to the REESL project

The Learning Centre is a high profile venue in a pleasant setting. This fact contributed to the overall positive rating of the workshop. The venue also provided opportunities to:

- Share RE information and raise the profile of Renewable Energy in the public arena;
- Attract a wide range of high profile personalities from Government, Private Sector, Donor Agencies and other key stakeholder groups
- Highlighted the importance and urgent need for similar venues for public learning about nature and the environment around the country;
- The pleasant setting of the venue, enable the participants to e

The workshop also enabled the REESL team, especially the EFA staff to recognize the importance of:

Coordination; Cordiality; Team-work; Planning; Attention to detail; Record keeping; Time-keeping; Listening; Hospitality; Stakeholder Coordination and Engagement; Working with the host community; Communication and sharing ideas; and Learning more about Renewable Energy.

1. Learning: Baseline information

The baseline information gathering coordinated by REESL partner Njala University, focused primarily on the following:

-Carrying out desk-based research of public and academic information to develop knowledge of:-Existing RE policy in Sierra Leone and engage with decision-makers to define key priorities in this regard;
-Leading a national level survey to gather information about RE technologies - availability, demand for and feasibility of, these technologies in the context of Sierra Leone;
-Carrying out site visits to inspect a sample of the technologies/projects and gather additional information, where necessary to determine the potential feasibility of the initiative n Sierra Leone.
-Determining, where possible, the potential for micro-financing and development of small-to-medium-sized enterprises (SMEs) and sustainable, community-level entrepreneurial ventures, engaged in the local manufanture and/or sale of RE technologies.

The visits found technologies that are currently under investigation and development by the private sector in Sierra Leone include gassifiers, improved cook stoves, alternatives to charcoal and large scale production of bio-ethanol. Development of technologies by research institutes are limited to bio-digestors and solar driers. NGO's seem to be concentrating on the distribution of solar PV for lighting and solar thermal to a limited extent

Further details of the desk research, surveys and site visits can be found in Annex XXX.

2. Collaboration: The Knowledge Base and Multi-stakeholder engagements

Knowledge Base

As part of Phase 1 of this project, the REESL team carried out desk-based research of public and academic information to develop knowledge of existing RE policy, RE technologies (availability, demand and feasibility). Dr. Richard Wadsworth (Associate Professor of Research Methods at Njala University) coordinated the baseline studies to identify community needs and energy users. Dr. Tarawalli (an energy consultant for the Government of Sierra Leone and resource person for the REESL project) provided a copy of the Energy Profile for Sierra Leone and produced a number of summaries of RE policy in Sierra Leone.

At the same time, EFA, the ERM Foundation and Njala University worked with local entrepreneurs to identify a number of RE technologies, which are:
(a) currently fabricated and/or available in Sierra Leone;
(b) manufactured by low carbon enterprises and entrepreneurs in other countries of Africa
These technologies were show-cased at the REESL Energy Fair

All of the above information was presented at the National Innovation Workshop in one form or another and offered up for discussion, debate and consideration by the attendees in order to "test" the validity of the Knowledge Base. Key findings from the baseline surveys were also presented to a select group of

stakeholders one day prior to the National Innovation Workshop to test the likely perception of the findings and clarify any uncertainty with respect to the facts being presented.

This testing process indicated:

- Further studies of existing energy use and community demand are needed as the national reconnaissance survey had a limited sample size, and several attendees at the workshop requested that the baseline data be verified (particularly where the survey results suggested that the energy environment has changed over the last few years). The reconnaissance survey can be used as the basis of a more detailed larger scale survey and aid in designing an improved stratification strategy and in some cases refining the questions asked.
- Positive verbal feedback was provided by attendees at the workshop regarding the work undertaken as part of the Energy Profile for Sierra Leone and the verbal policy summary that was provided by Dr. Tarawalli. One attendee noted that the information provided by Dr Tarawalli is not widely available or understood and the stakeholders would require additional time to review and digest it fully, in order to understand its implications.
- Sierra Leoneans are open to new technologies and new ideas provided that those technologies are appropriate i.e. significant cultural barriers to change were not identified and all of the technologies presented in the Energy Fair were generally recognised to be of interest in Sierra Leone and requiring further investigation, testing and adoption. As an example, local communities voiced their interest in using the "Wonder Stove", which is already available in Freetown and manufactured by a local entrepreneur. The local community leader noted that they were not previously aware that such technology existed. Similarly the prototype designs of Njala University were well received with many attendees expressing an interest in further prototype development.

Outreach Programme

As part of developing the Knowledge Base, EFA and the ERM Foundation implemented an "Outreach Programme" to identify a network of contacts for the REESL team and secure sufficient and appropriate attendeance at the National Innovation Workshops. The key steps that were undertaken as part of the Outreach Programme are noted below:

- Identify the main stakeholder groups with potential interest in the REESL initiative (government authorities, not-for-profit NGOs, private sector, financers, the educational sector and local communities).
- Identify organisations from within those stakeholder groups. (Note: Approximately 75 organisations were identified).
- Record some basic information about the organisation and categorise their interest in the initiative (i.e. are they potential workshop attendees, partners, event sponsors, donators of equipment or other);
- Six to eight weeks prior to the workshop - contact each organisation by letter, email or phone to communicate the upcoming National Innovation Workshop, ask for support and ask each organisation to respond with an "Expression of Interest"

- Four to six weeks prior to the Workshop – contact all of the individuals who expressed an interest. Formally invite those interested in attendees. Arrange shipment of donated RE technologies. Engage stakeholders to identify potential opportunities for partnership, sponsorship etc.
- Two weeks prior to the workshop – contact those who had not yet responded. Launch the REESL event page on the EFA Web-Site. Communicate the web-page launch to all stakeholders. Publicise the draft agenda on the web-page.
- The event and the project were featured on three radio programmes as well as a news item on national television. While television and one of the radio stations is clearly targeted at the English speaking elite, the two regional radio stations have much wider appeal.
- Press releases were issued in six newspapers and an informal open day conducted with reporters before the workshop.

Outcomes of the Outreach Programme

- The knowledge that emerged from the Outreach Programme is summarised in the excel sheet in Annex 21 (Master Contacts List)
- One inventor from the UK was identified as having potential to work with EFA in the future to roll out a solar-power phone charging station which he has already invented, which is not yet available in Sierra Leone.
- One donor organisation from the UK was identified as having an interest in attending the workshop and sponsoring future entrepreneurs engaged in low carbon enterprises.
- A number of local entrepreneurs confirmed their attendance at the Energy Fair and were prepared to show-case their activities and RE technologies.
- Entrepreneurs from four low carbon enterprises in Africa and two companies in the UK/Ireland donated RE technology/equipment and information/materials for permanent exhibition at the Learning Centre.
- Two private sector organisations in Sierra Leone expressed an interest in further sponsorship of EFA activities and/or partnership projects to investigate RE solutions to power poverty in Sierra Leone.
- Key-note speakers with appropriate authority and influence were identified to open the National Innovation Workshop and express their support of the REESL initiative e.g. the Minister of Energy, the Executive Chairperson of the Sierra Leonean EPA, the In-Country Manager of the Bumbuna Hydroelectric power project and local communities; and the village chief of the local community where there is no power at present.
- Appropriate representation from each of the stakeholder groups was secured, thus enabling the success of the stakeholder group focus groups at the workshop. Women and local communities were also well-represented at the workshop.

Lessons Learnt

Over the course of the six-month outreach programme the following lessons became evident:

- The Sierra Leone government and EPA are very supportive of the REESL project, EFA and initiatives of this nature (i.e. RE solutions to power poverty).
- The Innovation Workshop was of national interest as energy poverty amongst rural communities in Sierra Leone is of interest to a large number of organisations.
- Many of the private sector organisations were not aware of Sierra Leonean NGO network. There is no established network/community of contacts.
- Many of NGO/Government representatives were not familiar with the activities or project plans of the private sector organisations (including those who are proposing RE projects of national strategic

importance). Most of the stakeholder groups would be meeting for the first time at the workshop and many individuals communicated that they had limited understanding of the role/responsibilities of other stakeholder groups.

- Many of the international private sector organisations are not actively participating in any form of discussion or innovation to address energy poverty. The majority of organisations expressed an interest in the issue but not undertaken limited/no specific initiatives to date. Their focus appeared to lie in other areas.
- Many of the NGO/Government organisations expressed an interest in attending the workshop because they wanted to learn more and recognised that there is a need for capacity building and knowledge sharing as Sierra Leone has not yet established an appropriate Knowledge Base and human resources with appropriate technical skills to address power poverty.

The various engagements with officials of the Ministry of Energy left the REESL team with the impression that the Ministry of Energy is keen to promote RE but that it lacks technical capacity; perhaps so much emphasis has been placed in the past on getting donor funds and other financial resources that this lack of technical skills has been disguised. As an example all the technical assessments of the major hydro-power sites is undertaken by potential developers, the Ministry does not hold any of the technical information of flow rates, geology, water quality, and so on, all they have are MoUs (memorandum of understanding) with the potential developer.

Dissemination of the Knowledge Base

During the course of the six-month project, the team developed a substantial depository of relevant data, information, videos, films and materials communicating information relevant to Renewable Energy Empowerment of rural communities in Sierra Leone. The team also established an on-line database, where this information can be shared with each of the REESL Ambassadors. Print screens and access details for both the web-page and the on-line database ar shown in Annex xx. The database is currently being populated and will be formally "launched" once the final roadmap and all final reporting has been completed and uploaded to the site, ready for review by the Ambassadors. To facilitate dissemination of information to those without reliable internet access, the REESL team have also acquired a number of USB sticks, which will be distributed to workshop attendees, based in-country, who cannot access the online portals.

3. Supporting the Catalytic Process

A key component of the catalytic process was the Pre-Innovation Workshop Co-ordination which involved:

Developing a **workshop agenda** that included the scope, objectives, programme of events and list of invitees to the workshop

Delegating responsibility to the Ministry of Energy to lead the implementation of a 'Communications Strategy' to ensure that the CDKN – sponsored project activities, including the national survey, stakeholder engagements, the innovation workshop and results are communicated widely to all relevant stakeholders before, and after, the event.

Another activity that supported the catalytic process was the engagement by the project, of a competent and experienced team of workshop facilitators, resource persons and training providers was

to run a **pre-innovation workshop preparatory session** in Sierra Leone for selected representatives from the project team. The purpose of this session was to build consensus among the team members with respect to the information generated during the national survey and to test and critique the information, as well as the various materials and tools developed for the workshop. The session also allowed closer scrutiny of the exhibits of RE equipment donated / acquired from different sources, to determine their functionality and applicability to the local context.

A further intention of the preparatory session was to strengthen institutional capacity of the partners organisations by identifying, training and empowering members of the Project team to lead various aspects of the Innovation Workshop with a view to learning how to lead similar workshops in the future.

4. Innovation: The Renewable Energy Workshop and Energy Fair

The discussions and outcomes of the workshop

1. **Leadership**
    a. The government should take a lead role providing electrification, in the form of renewable energy to rural Sierra Leone.
    b. The lack of policy creates uncertainty for investors
    c. Local community leaders are open to the education of people about renewable energy and they recognize the urgent need for behavioral change.
    d. Change the bureaucratic bottlenecks that increase the cost of doing business
2. **Economic**
    a. Sierra Leone's economy stands to gain from the development of the renewable energy sector
    b. Lower tariffs on imports of RE equipment / technology to make the business more profitable and encourage the adoption of renewable energy through lower retail prices.
    c. Financial support for private sector in the form of starting up loans
    d. There is a need for the development of small-medium enterprises to speed up rural electrification
    e. There should be well established quality control / standards for RE Technology to protect consumers and ensure uptake of the new technologies
3. **Learning**
    a. Make renewable energy part of tertiary education curriculum
    b. Raise awareness about environmental problems resulting from deforestation
    c. Educate people about, and provide support for rural people to adopt use solar power and minimize use of biomass
    d. Every participant said they learnt new things at the workshop
4. **Partnerships**
    a. The workshop participants recognized people from different sectors that they need to partner or work with in order to play their role and achieve what they have committed to do as a Renewable Energy Ambassadors.
    b. There were renewable energy technology samples exhibited during the workshop allowing parties to see what is available, start making plans and business connections.

The workshop participants were handed a certificate of being a Renewable Energy Ambassador. The project team intends to use this diverse network of ambassadors to ensure on-going engagements to strengthen relationships for collaboration in the next stage of the project. At the end of the second day

of the workshop the participants were asked to write letters addressed to themselves, reflecting what they have learnt and what they have committed to do in their home and work lives. The letters will be mailed in three months' time to each participant by the EFA to remind them of their commitment.

Capacity building –

Every aspect of the REESL project provided an opportunity for capacity development. For example:
-There was basic training in research methods, conducted by the Njala University in preparation for the national survey. This involved the design and implementation of the reconnaissance survey; which was carried out in an iterative manner, with a properly thought out scoping study the experience of which was then used to refine the design of the main survey
- The staff demonstrated their understanding of the significance of various energy forms to power every aspect of social and economic livelihoods in the communities that they visited;
- They led focus group discussions in remote communities on the topic of renewable energy;
- They participated in the fabrication and installation of renewable energy devices at the learning centre, with clear understanding of their responsibilities for the upkeep and maintenance of these devices
-They played an active and significant part in the planning and hosting of the innovation workshop – from preparing the venue, to participating in the pre-workshop training, led by ERM Foundation.

Testimonial from Ericskon Soso Konneh – Multi Media Officer – EFA
"The renewable energy empowerment – Sierra Leone/CDKN Project, was a real learning process for me - conducting a nationwide survey on energy, which was fully in-depth, looking at the energy potential to of our country. Taking part in this project helped me to understand the importance of energy access for the development of people in Sierra Leone, especially in the remote areas, where they are mainly poor and in dire need of energy to help improve their livelihoods."

Testimonial from Violet Lengah Fofanah – Operations Manager – EFA
"Being part of a team responsible for preparing for the workshop, helped me to gain much understanding about the planning for large events. Participating in the workshop enable me to gain knowledge about result that came from the survey. Most Sierra Leoneans do not think or have the knowledge about renewable energy and its importance. I was delighted to know roughly how many batteries are consumed by Sierra Leoneans in country and how it impacts on the local environment. Engaging in discussions with professionals from various backgrounds – government, private sector, civil society, local community leaders - on the topic of renewable energy helped me to appreciate the relevance of the work of EFA and the need for us as staff to continue to learn more about the opportunities for promoting renewable energy in Sierra Leone."

The Roadmap

For Sierra Leone to achieve a comfortable carbon-neutral lifestyle all stakeholders will need to overcome serious barriers. Most emphasis has been placed on the economic, specifically the cost of the technologies, but knowledge barriers are as important if not more so. One issue is a "silo" mentality with limited flow of information between and within stakeholder groups. One of the most important features of the workshop was in bringing together different groups that would rarely interact in other situations. A further common barrier is that Sierra Leone lacks a maintenance culture, due in large part

to the lack or inadequate availability of skills and knowledge. The Roadmap attempts to identify where there is a critical flow of information and where are the barriers to further progress. *See annex 10*

Conclusion

Sierra Leone is currently close to being carbon neutral. Unfortunately this is due to poverty rather than conviction; the challenge is how to use RE to provide light, water, motive power to make life less of a constant battle with drudgery. The background data collected from the literature, interviews with NGO's, SME's, Ministries and the reconnaissance survey, gives us a good general idea where Sierra Leone is now with Renewable Energy. An important finding is that there are no inherent cultural barriers to technology change in Sierra Leone, people will rapidly adopt new technologies that offer benefits and that are affordable. The Innovation workshop was an important first step in breaking down the "silo mentality" among many of the key stakeholder groups. Of course EFA and its partners, will continue to build on this initiative through their respective renewable energy – focused programme activities, in various parts of the country.

However the project generated a great deal of valuable information which needs to be communicated (to the public, government and its policy makers, the business sector, the civil society organisations, religious and educational establishments) in ways that will instigate the relevant policy changes at the governmental level and inspire positive attitudes within the general public.

The concept of Renewable Energy Ambassadors, which resulted from the Innovation workshop, could potentially help to spread the messages far and wide, and create opportunities for dialogue and understanding. But this is an initiative that could quickly decay without further input.

Annexes

1. CDKN_Objectives Form
2. AIDE Memoire - Basis of research
3. News Paper articles
4. CDKN_Supplier Report
5. Extract of Sierra Leone Energy Profile
6. Household survey_summary
7. Business survey summary
8. Producers survey summary
9. REESL PRESS RELEASE
10. REESL Roadmap
11. REESL Winning Poem
12. REESL Workshop Report_For CDKN
13. WORKSHOP PROGRAMME.
14. REESL Winning Poem.
15. FINAL-REESL INVITATION
17. Quiz Final
18. Workshop Poster – Signed by participants
19. Workshop Attendance list
20. Workshop Methodology

21. Master Stakeholder Contact List
22. Film for TV news: http://www.efasl.org.uk/wp-content/uploads/2013/09/PRJ_20130718-Small.mp4
23. Film for Workshop: http://www.efasl.org.uk/wp-content/uploads/2013/09/CDKN.mp4