

University of Nairobi
Wangari Maathai Institute for Peace and
Environmental Studies

REPORT

Training of Trainers (ToT) Course on Sustainable Clean Energy Entrepreneurship



14th to 25th July 2014
wPOWER Hub, Wangari Maathai Institute for Peace and Environmental
Studies, University of Nairobi, Kenya

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CONTACTS

wPOWER Hub
Wangari Maathai Institute for Peace and Environmental Studies (WMI)
University of Nairobi,
College of Agriculture and Veterinary Sciences
P.O Box 30197, Nairobi, Kenya
www.wmi.uonbi.ac.ke

1. BACKGROUND

In honor of “Gender Day” at the annual United Nations Framework Convention on Climate Change Conference of the Parties (COP-19), the United States is highlighting its actions to harness the potential of women and women’s networks to increase the use of clean energy technologies, which in turn helps reduce climate change. The Department of State launched the Partnership on Women’s Entrepreneurship in Renewables (“wPOWER”) in January 2013. wPOWER aims to empower more than 8,000 women clean energy entrepreneurs across East Africa, Nigeria and India who will deliver clean energy access to more than 3.5 million people over the next three years.

To reach this goal, the Department of State and USAID have teamed up with the MacArthur Foundation, the Global Alliance for Clean Cook stoves, CARE International, Solar Sister, Swayam Shikshan Prayog and the Wangari Maathai Institute for Peace & Environmental Studies.

Globally, more than 1.3 billion people lack access to electricity, and at least 2.7 billion people lack access to clean cook stoves and fuels. While not the primary source of climate pollution, inefficient lighting and cooking contribute to climate change and the degradation of natural resources. In off-grid communities, women are the primary users of clean technologies like solar lamps and clean cook stoves and are at the forefront of adopting the use of new technologies. wPOWER is working to unlock this largely untapped potential of women and women’s groups to help fill the “last mile” gap in the supply chain to reach areas lacking energy access.

To work towards this goal, the US Department of State partnered with several organizations, and created the wPOWER Hub at the Wangari Maathai Institute for Peace and Environmental Studies (WMI) at the University of Nairobi. Wangari Maathai institute was founded by the University of Nairobi in collaboration with the late Nobel Laureate Professor Wangari Maathai 2009. The new wPOWER Hub will build the evidence base on women, energy access and climate solutions; hold train the trainer (ToT) workshops; facilitate African and Indian women entrepreneur and leadership exchanges for the role of women in clean energy entrepreneurship.

In order to create and empower women clean energy entrepreneurs, the wPOWER Hub at the Wangari Maathai Institute developed the Training of Trainer’s Course on Sustainable Clean Energy Entrepreneurship.

2. INTRODUCTION

The first Training of Trainers (ToT) course on sustainable clean energy entrepreneurship was held by the Wangari Maathai Institute for Peace and Environmental studies at the Green Belt Movement Langata Training center in Kenya from the 14th to the 25th of July 2014. This training forms part of wPOWER hub activities towards the Partnership on Women’s Entrepreneurship in Renewables (“wPOWER”) .The course aims nurture change agents and equip them with the skills and tools they need to bring about community transformation in clean energy, environmental stewardship and livelihood improvement.

This was a 3 weeks course targeting grassroots value driven community leaders involved in natural resources management and interested in sustainable clean energy. The course has the following objectives

- To instill knowledge and values on linkages among sustainability, clean energy, livelihoods, environment, climate change and gender.
- To enhance agency and skills in women-led entrepreneurship in sustainable clean energy markets.
- To develop trainers who can catalyze change, inspire, empower transform and create champions of sustainable clean energy.
- To equip trainers with knowledge and skills on effective communication and training skills

2.1 Course Structure

The Training of Trainers course is structured into four modules:

1. Empowering and Developing Transformative Leaders
2. Sustainable Clean Energy Entrepreneurship,
3. Environmental Stewardship, and
4. Developing and Delivering Content

The module on Empowering and Developing Transformative Leaders provides inspiration and reinforces the transformative and leadership skills of the trainees . This is meant to motivate them to appreciate their role as leaders and as agents of change in the community.

The module on Sustainable Clean Energy Entrepreneurship is a technical module designed to provide the trainees with a clear understanding of the various small-scale home-based technologies while also equipping them with the tools and skills for doing business along the sustainable clean energy value chain. Participants learnt about access to and economic opportunities associated with, markets for some of the most appropriate small-scale clean technologies like biomass energy, solar lighting and clean cook stoves. They were also impacted on market skills .

The module on environmental stewardship addressed the role that these leaders could play in safeguarding the environment and in unlocking women's potential as sustainable natural resource managers. It sought to build skills on environmental governance, climate resilience, forest rehabilitation, the protection of water sources and environmental stewardship.

The module on developing and delivering content was aimed at teaching participants to develop and deliver content for community transformation with the aim of them teaching others in their respective regions.

3. TRAINING METHODOLOGY AND PARTICIPANTS

3.1 Training Methodology

This training program was unique for its holistic and experiential focus. It was delivered through a rich mix of training methodologies; it contained lessons that engaged the participants through field excursions, class activities (lectures, exercises), brainstorming, case-based group work, and individual assignments. The participants also benefited from guest-speakers and practitioners (annex 2) who reinforced the classroom learning. A selected number of clean energy product producers and suppliers (annex 3) presented their technologies in an open exhibition further giving participants a chance to interrogate the technologies and the possibilities they present. Some lessons were offered in the field (annex 4) and this allowed interaction with communities and the associated technologies.

The delivery was multidisciplinary drawing appropriately from diverse fields of expertise. It brought together academic faculty members from the Wangari Maathai Institute; practitioners from different Not-for profit organizations including Green Belt Movement, Practical Action, SNV Kenya, World Agroforestry Centre (ICRAF), Global Alliance for Clean Cook stoves, Daughters of Mumbi Global resource center; Amani institute and Resonate Rwanda

The training was participatory in nature .A training manual consisting of all the four modules was produced and issued to all the participants as a basis of facilitation.

3.2 Participants

The Training of trainer's course on sustainable clean energy entrepreneurship was attended by 26 participants (Annex 1) drawn from wPOWER partners from different countries and regions. Green Belt Movement, Care International, Solar Sisters, Swayam Shikshan Prayog (SSP) and Women for Women International selected participants from their wPOWER projects in Kenya, Uganda, Tanzania, Rwanda, Nigeria and India. These participants were distributed as follows:

Kenya (9) , Uganda (2), Tanzania (3) ,Rwanda (3) ,Nigeria (4) India (5) .Of the 26 participants, 16 were female and 10 were male

To encourage learning across the various organizations and countries, participants were grouped into 7 tables in such a way that each table had a good representation based on Gender, Country and Organization. To further enhance leadership each table was asked to nominate a leader who took responsibility for keeping time each day in turns.

Table Grouping

<u>Group 1</u> <ol style="list-style-type: none">1. Mr.Upmanyu Shankerao Patil, India/SSP2. Paul Thiong'o, Kenya/GBM3. Trishala Sunil Dangare, India/SSP4. Shanta Prabhkar Gawali, India/SSP	<u>Group 2</u> <ol style="list-style-type: none">1. Laxmikant Vasantrao Malvadkar, India/SSP2. Gerald Wetaaka, Uganda/Solar Sister3. Providence Mavubi, Rwanda/Care International4. Jayshri Ram Kadam, India/SSP	<u>Group 3</u> <ol style="list-style-type: none">1. Jayne Opitto, Uganda/Solar Sister2. Francine Mukaruberwa, Rwanda/Care International3. Robert McAyoo, Kenya/Care International4. Judy Nyagwala, Kenya/Care International
<u>Group 4</u> <ol style="list-style-type: none">1. Lilian Muchungi, Kenya/Green Belt Movement2. Ann Ater, Kenya/Care International3. Glory Tarimo, Tanzania/Care International4. Nsanzamahoro Polycarpe, Rwanda/WW International	<u>Group 5</u> <ol style="list-style-type: none">1. Clement Obayi, Nigeria/Solar Sister2. Jane Karuga, Kenya/GBM3. Angeline Adem, Kenya/Care International4. Sarah Mbuya, Tanzania/Solar Sister	<u>Group 6</u> <ol style="list-style-type: none">1. Ofomeke N. Emmanuel, Nigeria/WW International2. Mary Onoja, Nigeria/Solar Sister3. Alice Wanjiru, Kenya/GBM
<u>Group 7</u> <ol style="list-style-type: none">1. Soster-Richard Kizigha, Tanzania/Care International2. Samuel Kariuki, Kenya/GBM3. Blessing Ekanem, Nigeria/Solar Sisters		

4. TRAINING OF TRAINERS COURSE DELIVERY

4.1 Opening Ceremony

Ms. Wanjira Mathai, The wPOWER Hub project director at the Wangari Maathai institute for Peace and Environmental studies, officially opened the workshop. She welcomed all the participants from Nigeria, Rwanda, Uganda, Kenya, India and Tanzania. She mentioned that seeing the participants and the start of this training was the highlight of the year for the wPOWER hub. She particularly thanked Prof Kiama for the leadership and the vision that has led to the successful planning of the training. She passed her thanks to Green Belt Movement for hosting the training at the Green Belt Movement Langata Training center, which is an inspiration and constant reminder of the spirit and inspiring of the

Green Belt Movement and Prof Wangari Maathai . She thanked the participants (trainees) for their interest and passion and asked them to be free to share, learn and to also to teach others.

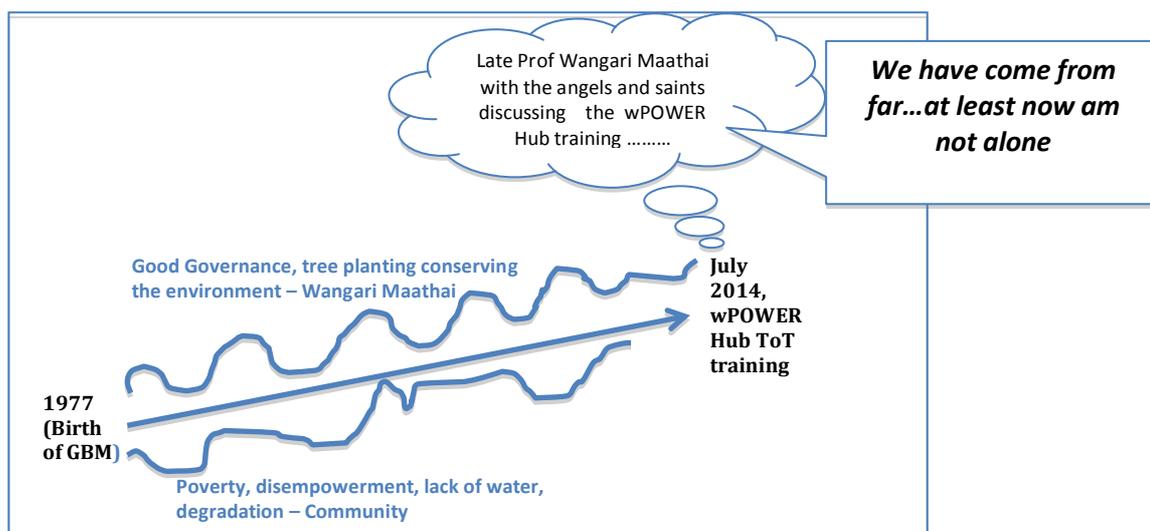


Ms. Wanjira Mathai, wPOWER hub project Director and host to the training giving her welcoming remarks



Ann Ater, woman entrepreneur from Care Kenya following the opening ceremony

Ms. Aisha Karanja, the Green Belt Movement (GBM) Executive director, welcomed all participants and highlighted that the training course has been well thought through and that the modules that form the training course will deliver change agents as envisioned by Wangari Maathai. She described this through a pictorial presentation below:



Mrs. Miriam Chege, one of the founding members of the Green Belt Movement gave an invocation to get the training started. She mentioned that there would be time that each participant will need to reflect and to look inwardly on issues of the environment..

Mrs. Chege made a rallying call to all. *“ There can be no other satisfying employment, engagement than in caring, protecting the environment. Let us go forth because Wangari’s spirit lives, our responsibility is to make sure that it continues to grow in Africa and the rest of the world”*



Mrs. Miriam Chege, one of the founding members of the Green Belt Movement giving her opening remarks

*When I was young I thought that failure was impossible
All wrongs would be righted in my time.
Now am old I see that failure is impossible
I pass the torch to you, will you hold it high?*

*For we are sowing winter wheat
That other hand will harvest
That they might have enough to eat
After we are gone.*

*We will plant shade trees that we will not sit under
We will light candles that others can see the way
We'll struggle for justice though we'll never see it
flower
Our children will live in peace one day.*

The ceremony was officially opened with the lighting of the candle, a ceremonial means by which Green Belt Movement open workshops as a symbol to bring Wangari Maathai's spirit into the room for inspiration

wPOWER partners presentations

wPOWER Partners are: Swayam Shikshan Prayog (SSP), Green Belt Movement, Mac Arthur Foundation, Global Alliance for clean cook stoves, Care International, Women for Women International and Solar Sister.

Mr. Upmanyu Shankerrao Patil of SSP mentioned that the wPOWER project at SSP started in 2012. He stated that SSP has reached about 700 women entrepreneurs and about 4000 community members with clean energy products such as clean cook stoves, solar products, biogas, solar water heaters and fuel manufactured using agricultural waste. They are creating retail networks as well as small manufacturing units through the women.

Mr. Francis Songela, co- coordinator of the wPOWER program care International presented for Care International. The Care International wPOWER project started in late 2012 before the launch. It covers 3 countries i.e. Tanzania, Uganda and Kenya. Care works through existing groups to establish a sustainable clean energy business referred to as village savings and loans associations. He highlighted the achievements of the project so far as: Distributed over 12,000 clean cook stoves across the 3 countries, 8000 solar lamps close to 600 entrepreneurs where 80% are women. More than 100,000 people have been reached with clean energy products

Oforneke Nnamdi Emmanuel, project officer, Women for Women International Nigeria gave highlights on the program with their main objective being to equip women with skills and resources to move from poverty to a stable society. They will be working in the near future with solar sister so as to integrate training on solar energy products entrepreneurship in their training program

Jane Opitto of Solar Sister Uganda mentioned that they operate in 3 countries i.e. Uganda, Tanzania, and Nigeria. Rwanda and Sudan are yet to be launched officially. Solar Sister objective is to bring light, hope and opportunity. They hope that in the next 5 years, every household would have clean energy.



Jane Opitto, Solar Sister Uganda introducing her Organization

Thomas Elliot of New course conducted a training baseline survey through a questionnaire issued to all the participants.

Ground rules were set to govern the proceedings of the training and it was agreed that anyone who broke or disobeyed the ground rules would give an energizer or a dance to the group.

Ground rules

- Raise your hands to speak
- Keep time
- Mobile phones on silent mode
- Minimize movements during lessons
- Active participation and listening
- Respect
- Obey time keeper

Opening Ceremony Participants

Upmanyu Shankerrao Patil	Prof. Stephen Kiama
Laxmikant Vasantrao Malvadkar	Wanjira Maathai
Jayshri Ram Kadam	Benson Ochiel
Trishala Sunil Dangare	Terry Githinji - Kariuki
Shanta Prabhakar Gawali	Janet Ndoro
Lilian Muchungi	Njoki Njehu
Jane Karuga	Solange Impanoyimana
Alice Wanjiru	Stephen Kinyanjui
Samuel Kariuki	Ms. Aisha Karanja
Paul Thiong'o	Dr. Mary Njenga
Angeline Adem	Peter Fella
Providence Mavubi	Dr Thenya Thuita
Nsanzamahoro Polycarpe	Prof David Mungai
Francine Mukaruberwa	Songela, Francis
Sarah Mbuya	Thomas Elliot
Soster Kizigha	Miriam Chege
Glory Tarimo	Aisha Karanja
Gerald Wetaaka	Cyrus Kimamo
Jane Opitto	Jedidah Wanyeki
Blessing Ekanem	Benard Muthiani
Clement Obayi	Mary Alice Onyura
Mary Onoja	Cynthia Elicius
Oforneke Nnamdi Emmanuel	
Juddy Angaya	
Robert McAyoo	
Anne Ater	

4.2 Introduction to the Training

Prof. Kiama, the director of the Wangari Maathai Institute and the academic director of the wPOWER hub in his opening remarks emphasized the need for the trainees to feel free and interact fully with the trainers. He started off the training formally by ensuring that participants were in the allocated tables. Team leaders for the day were appointed. All the participants filled their expectations for the training. During the opening ceremony, all participants including the trainers had the opportunity to introduce themselves



Participants following the opening ceremony

Prof. Kiama gave a presentation on the wPOWER hub introducing the program and giving further details of Prof. Wangari Maathai and how her vision grew to be what we have today. He echoed the saying by Wangari Maathai that “when we plant trees, we plant the seeds of peace and hope”. He emphasized that many of the things we will do are not for ourselves but for the good of all.

Prof Kiama noted that During the last AU summit at the auspices of the New African Union Head quarters Complex in Addis Ababa, Ethiopia all the head’s of states from Africa decided to recognize the life and work of Wangari Muta Maathai. The Summit also encouraged the AU Commission, to take all the necessary measures to support Wangari Maathai Institute for Peace and Environmental Studies (WMI) as an African Centre of Excellence, to encourage research on environmental governance and its linkages with peace, human rights and democracy in Africa. He indicated that the wPOWER program is aligned to the Wangari Maathai Institute for Peace and environmental studies (WMI) strategic plan. *“An inspiring living innovative and creative laboratory where new “green” technologies and best practices of environmental sustainability and conflict resolution can be fostered, developed, tested, validated and demonstrated” Strategic plan 2010-2020*

Prof Kiama further presented on the wPOWER project aims and what the project aspires to do. He further mentioned the wPOWER partners and cited that all of these organizations have been operational, the value of wPOWER Hub is to add value to them and to convene them as demonstrated in this training and hopefully they can work better.



The participants were asked to write down their expectations. The following were their expectations :

Participants Expectations

1. To know new products in Sustainable clean energy entrepreneurship
2. To share Experiences with participants from other countries.
3. To meet colleagues in clean energy entrepreneurship.
4. To Know about Green Belt Movement and its role in wPower and history
5. To acquire knowledge on Environmental stewardship
6. Learn more on Sustainable Energy and climate change
7. Acquire a certificate for participation in the course on sustainable clean energy entrepreneurship.
8. Learn how to be a better trainer in sustainable clean energy and entrepreneurship.
9. To know about clean energy and its relationship to climate change
10. Be a better leader and manager
11. To know ways of collaborating in Environment protection
12. To acquire skills on entrepreneurship and women
13. To learn how to develop content for training.
14. To learn who was Wangari Maathai
15. To be empowered to empower others
16. To understand role of wPOWER and my role in advancing it
17. To have fun
18. To learn something new
19. To gain experiences
20. To equip myself with excellent facilitation skills
21. To get allowances and out of pocket reimbursement
22. To be a good representative
23. To get new ideas for involving children in environment stewardship



Prof S.G Kiama, Ms. Wanjira Mathai and Njoki Njehu following proceedings closely during a site visit

4.3 The Teaching Schedule

Module 1: Empowering and Developing Transformative Leaders

Session 1: Life and Legacy of Wangari Maathai

- Lesson 1 The Life and Legacy of Wangari Maathai
- Lesson 2 Intergenerational Learning
- Lesson 3 Earth Charter
- Lesson 4 Risks and Opportunities of Leadership
- Lesson 5 The Hummingbird Story

Session 2: Making Leadership Personal

- Lesson 6 Personal Examples of Leaders
- Lesson 7 Women in Leadership
- Lesson 8 Case Studies of Important Women
- Lesson 9 Examining Failure and Female Leadership Void
- Lesson 10 Your Leadership Craft

Session 3: Storytelling for Leadership

- Lesson 11 Why Stories Matter
- Lesson 12 Identifying Core Values
- Lesson 13 Life Map
- Lesson 14 Storytelling Structure
- Lesson 15 Crafting an Inspirational Story
- Lesson 16 Peer Feedback on Stories
- Lesson 17 Practical Application of Storytelling

Session 4: Finding Your Agency (Adapted from Greenbelt Movement)

- Lesson 16 Identifying Community Problems
- Lesson 17 The Wrong Bus
- Lesson 18 Leaders as Problem Solvers

Lesson 19 Self-Reflection in Leadership

Session 5: Drawing Out Leadership in Others –

Lesson 23 Adapting Your Style & Examples
Lesson 24 Responsibility for Success of Others

Module 2
SUSTAINABLE CLEAN ENERGY ENTREPRENEURSHIP

Session 1: Background of traditional energy sources

Lesson 1 Uses of traditional energy and increasing demand
Lesson 2 Type of traditional energy and their benefits

Session 2: Implications traditional energy on natural resources climate change, livelihood and public health

Lesson 3 Effects of traditional energy on natural resources and climate change and how to resolve them
Lesson 4 Implications of traditional energy on livelihoods and public health and how to address the challenges and harness the benefits

Session 3 The concept and need for sustainable clean energy

Lesson 5 Sustainable clean energy and its importance

Session 4 Innovation in sustainable clean energy

Lesson 6 Briquette production and uses
Lesson 7 Group work on participants voices on applicability of briquette technology in their local conditions
Lesson 8 Biogas production and uses
Lesson 9 Group work on participants voices on biogas technologies applicability in their local conditions
Lesson 10 Solar energy production and uses
Lesson 11 Group work on participants voices on solar energy technology applicability in their local conditions
Lesson 12 Wind energy Production and uses
Lesson 13 Group work participants voices on wind energy technology applicability in their local conditions
Lesson 14 Small hydro power production and uses
Lesson 15 Group work on participants voices on small hydro power technology applicability in their local conditions

Session 5 Cleaner cooking technologies

Lesson 16 Traditional cooking practices and the challenges they face in the sustainable energy debate
Lesson 17 End users consideration in developing of cleaner cooking technologies

Session 6 Benefits of the Sustainable clean energy innovations

Lesson 18 Benefits of the Sustainable clean energy innovations

Session 7 Trainee recommendation on sustainable clean energy

Lesson 19 Trainee recommendation on sustainable clean energy

Session 8 Entrepreneurship

Lesson 20 Introduction to Entrepreneurship
Lesson 21 Entrepreneurship mindset

Lesson 22 The entrepreneurship within me
 Lesson 23 Business project
 Lesson 24 Business model canvas

Session 9 Business Canvas Model

Lesson 25 My product and features
 Lesson 26 Who are my customers
 Lesson 27 Distribution channels
 Lesson 28 How do I relate to my customers
 Lesson 29 Business Environment
 Lesson 30 Finance 1: Money coming in
 Lesson 31 Finance 2: My cost
 Lesson 32 Finance 3: Key resources
 Lesson 33 Key activities
 Lesson 34 Key partnerships
 Lesson 35 Business fair
 Lesson 36 Understanding failure
 Lesson 37 Sales Techniques

Session 10 Learning to Sell

Lesson 38 Sales presentations
 Lesson 39 Live sales activity
 Lesson 40 Final sales presentation

Module 3 ENVIRONMENTAL STEWARDSHIP

Session 1 Definition and type and natural resources

Lesson 1 Definition – Terminologies, principles and concepts Lesson 2
 Types of Natural Resources and Gender Issue

Session 2 Environmental Stewardship

Lesson 3 The Role of Spirituality

Session 3 Understanding Natural Resources Management

Lesson 4 Key issues' in Natural Resources Management
 Lesson 5 Natural Resources Management Approaches and Associated Challenges
 Lesson 6 Environmental Degradation and Energy

Session 4 Community Based Biodiversity Conservation and Livelihood Options

Lesson 7 Understanding Biodiversity Conservation – Wildlife
 Lesson 8 Community Based Forest Management

Session 5 Water Resources and Food Security

Lesson 9 Water Harvesting Techniques
 Lesson 10 Water Harvesting and Food Security
 Lesson 11 Seed and Food Security
 Lesson 12 Water Resources Management Approaches
 Lesson 13 The role of communities in safeguarding water resources
 Lesson 14 Water Sources and Riparian Management

Session 6 Fostering Environmental Stewardship

Lesson 15 GBMs CEE Workshop Tools (chain)

Lesson 16 Fostering Values

Module 4

DEVELOPING AND DELIVERING CONTENT

Session 1: Introduction To Training Techniques And Learning Styles

Lesson 1 How Adults Learn Best

Session 2: Training Needs Analysis

Lesson 2 Gathering information about sustainable clean energy entrepreneurship

Lesson 3 Training needs analysis

Lesson 4 Designing a workshop programme

Lesson 5 Developing a participant pre-course questionnaire

Session 3: Course Design, Delivery And Participatory Evaluation

Lesson 6 Making arrangements for a course

Lesson 7 Designing a training course

Lesson 8 Presenting the training course

Session 4 The Art Of Instilling Values, Inspiration And Mentoring

Lesson 9 The art of instilling values and inspiring others

Lesson 10 Mentoring

Session 5 Use Of Demonstrations, Appropriate Case Studies And Demonstration Sites

Lesson 11 Demonstrations

Lesson 12 Case Studies

Lesson 13 Demonstration sites

Session 6 Participatory Teaching And Communication Skills

Lesson 14 Interactive/Participatory teaching

Lesson 15 Communication Skills



4.4: Module 1: Empowering and Developing Transformative Leaders

Njoki Njehu, Executive Director, Daughters of Mumbi Global Resource Center, Kenya, and Solange Impanoyimana from Resonate Rwanda delivered this module, Stephen Kinyanjui and guest speaker Reverend Njenga also gave inspiration to the participants. It consisted of 5 sessions with a total of 24 lessons ¹.

The objectives of the empowerment and leadership module were:

- Enhance their own agency and leadership
- Train and inspire others to be community leaders
- Analyze and discuss examples of female leadership
- Identify and cultivate new leaders.

- Communicate effectively through storytelling and relevant cultural example

The life and legacy of Wangari Maathai was communicated very effectively through a video documentary from the Green Belt Movement titled “Taking root the Vision of Wangari Maathai “ The session trainer, Njoki Njehu explored together with the participants the learning from life of Wangari Maathai as follows:

How Wangari Maathai’s life inspires:

¹ The module manual with detailed content was given to each of the participants and was availed to them for download through drop box

- Her commitment and passion for conserving the environment comes out very closely. Its important that as you do whatever you do, make it about the people you are working with
- She identified a problem and found a solution, had a vision and followed through. She was a change agent.
- She was positive, courageous and determined and she never gave up.
- She was strong, focused and believed in what she was doing.
- Anyone can make a difference irrespective of her profile, background. Wangari Maathai described herself, as “I am a child of the soil”. As a leader in order to communicate you identify with them.
- She involved the community and she took her time with them
- A holistic approach
- Her legacy endured

Njoki Njehu, the session facilitator asked the participants to think through what they would want their legacy to be. She further explored on issues of intergenerational learning gave reference to the earth charter² and discussed the hummingbird story with the participants and the lessons thereof. Njoki Njehu implored on the trainees that they have to think as leaders not only in the organization but also in their life and in communities.

Njoki Njehu together with Solange Impanoyimana and Stephen Kinyanjui delivered further inspiration and training on developing Transformative leadership. The delivery of this module was further enriched through a guest speaker the Rt. Reverend Njenga who through his story of leadership and the struggles and sacrifices inspired the participants.

Some Highlights from this Module

The Hummingbird Story

<p>Challenge: Forest on Fire</p> <p>Choice: Put out the Fire</p> <p>Outcome: Forest Kept burning</p>	<p>Outcome does not always have to be positive, but there should be effort to do something and there should always be a lesson</p>	<p><u>Values</u></p> <p>Love for others</p> <p>Responsible</p> <p>Determination</p> <p>Hard work</p> <p>Leadership</p> <p>Courage</p> <p>Commitment</p>
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² The earth charter- A declaration of fundamental ethical principles for building a just, sustainable, and peaceful global society in the 21st century



Njoki Njehu (in the middle) with trainees Clement Obayi of Solar Sister Nigeria and Angeline Adem Care Kenya

To further enhance the understanding and to provide more inspiration, the participants were taken to sites that were a mark of the work and leadership of people who have been before them such as Wangari Maathai. This module was supported through a site visit to Karura Forest and to Uhuru Park on the 20th of July.

Karura forest and Uhuru Park are what they are today and are a symbol of Prof Wangari Maathai's relentless effort and leadership to protect at conservation.



Participants planting a tree in Karura forest assisted by Prof Karanja

4.5 Module 2: Sustainable Clean Energy and Entrepreneurship

This Module was delivered by Dr Mary Njenga of World Agro forestry centre ICRAF , John Kapolon of practical action, Daniel Wanjohi of global alliance for clean cook stoves ,Jechoniah Kitala of SNV Kenya, Peter Fella of Amani institute and Caroline Gertsch of Amani institute.

Expected learning outcomes of this module were that :

- Participants should have knowledge on types and sources of sustainable clean energy
- Participants should have skills and mindsets on sustainable clean energy entrepreneurship opportunities
- Participants should have knowledge and skills on nature based and conservation enterprises
- Participants should have ability to identify financial opportunities, innovations and design in sustainable clean energy.
- Participants should develop an entrepreneurship mindset and understand their own abilities in business
- Participants will understand the various elements of a business i.e. customer segments, distribution channels, etc
- Participants will understand the Business Model Canvas (BMC) process and be able to design a business using BMC process
- Participants will be able to identify financial opportunities through business in sustainable clean energy



Briquettes burning 1

Dr Mary Njenga introduced the concept of energy sources, Traditional sources of energy and sustainable clean energy and the implications of these energy sources on natural resource management , climate change, livelihoods and health.

Issues highlighted were the adverse effects of most of these energy sources such as , intense deforestation, adverse effects on the health of women and children from smoke inhalation and the long hours and energy they use to get the wood fuel from the forests.

It was noted that there is need to rethink around behaviors on the use of biomass including having trees intercropped or in the farms. The other issues and highlights from the discussions was the need for Improved energy technologies, improved cooking areas such as increasing ventilation in the biomass kitchens, using well dried wood fuel. Creating awareness on all the adverse effects was identified as one of the solutions.

Cyrus Kimamo, a guest from the Green Belt Movement further encouraged the trainees to plant trees on farm and to teach others to do so.



Lillian , Blessings and Providence , Some of the ToT participants planting a tree on farm during the Kereita site visit

Innovations in clean energy technologies were explored at length for most of the training as detailed below. This was about improving the cooking technologies and practices.

Briquettes

Mary Njenga introduced and delivered about the briquetting technology. The various types of charcoal briquettes were presented both through lectures and through practical production of the briquettes.

During the open exhibition, Mary Mtola from Kibera 's punguza ngarama group together with two women with whom they make charcoal briquettes for sale demonstrated to the participants how to make briquettes using charcoal dust and soil.



Knowledge and further inspiration on the briquetting technology was provided during an experiential field visit to Mwamko Foundation in Kahawa Soweto on the 17th of July. Milka of Mwamko foundation (profile in Annex 4, e) demonstrated in detail how they make briquettes using charcoal dust and explained how she has made this into a viable business that has improved her family's livelihood.

The highlights on briquetting technology were:

- They are easy to make and production process can be manual or mechanized.
- Sustainable because they are cheap and uses raw materials based on location.
- Cleans the environment as it uses waste products and has minimal emissions.
- Briquettes have minimal emissions hence they are clean and good for health
- They are economical as they burn for a long time



Briquette making process, manual and mechanized. From left: Mary Mtola during open exhibition, Milka of Mwamko foundation in Kahawa Soweto and Dr Mary Njenga together with trainees during the Kereita field trip.

Biogas and Solar technologies

Jechoniah Kitala of SNV Kenya presented on biogas as one of the clean energy technologies. He also highlighted on solar technology for lighting purposes. Participants received further information on solar technology from Ecozoom and dlight solar companies during the open exhibition held on the 16th of July.

Further learning and inspiration on biogas production was provided during the Kereita field visit facilitated by KENVO(site brief in annex 4,f).



A farmer in Kereita showing her biogas production unit

Wind energy and Micro hydropower

John Kapolon, energy specialist and head of energy access, Practical action presented the possibilities of getting energy from moving water and moving wind.

One of the best examples of wind energy is the grid connected Ngong Power Station wind farm located on Ngong hills in Nairobi

Experiential fields visit to one of practical actions' micro hydro project provided participants with more understanding of how it works and the possibilities it presents for a small community. The site was at the Thima Micro hydro project in Kirinyaga visited by the participants on the 19th of July. Site brief in annex 4,g)



Improved cooking technologies

One of the highlights of the discussions in this module was the adoption of clean cooking technologies mainly the clean cook stoves.

Daniel Wanjohi , Global alliance for clean cook stoves started this session with a video clip taken in kitchen setting in one of the villages in Kenya . What was noted from the video clip was the lack of ventilation, too much smoke with the occupants constantly coughing and even struggling for clear vision. Daniel Highlighted that in Kenya , about 15,000 people die as a result of indoor air pollution mainly women and children under five with complications diagnosed as asthma, bronchitis, coughs. This further emphasized the need to transition to the improved cooking technologies.

Participants were further exposed to the various types of clean cook stoves during the open exhibition which brought together a number of clean cook stoves suppliers namely: cooks well Jikos , Burn manufacturing, ecozoom and Envirofit.

Cookswell jikos displayed energy saving cooking devices such as jikos, ovens, home –charcoal making kiln that is used to make charcoal from small and most types of biomass hence reducing the need to cut down whole trees. They also through the woodland 200 trust promote commercial afforestation showing and promoting how easy and efficient it

is to grow your own, make your own, use your own biomass fuels and clean cook stoves at home. Burn manufacturing, ecozoom and Envirofit displayed the energy saving jikos with envirofit and ecozoom having firewood cook stoves as well. These cooks' stoves use less wood fuel and charcoal and have minimal emissions

During the field visits in Kereita forest, Dr Mary Njenga further exposed participants to other types and models of clean cooking technologies among them a home use charcoal making kiln.



Charcoal making kiln to make charcoal from small branches or most dry biomass hence reduce g the need to cut down whole trees.

Entrepreneurship

This was one of the other session of the module on sustainable clean energy and entrepreneurship. Peter Fella and Caroline Gertsch of Amani Institute delivered it. Becca Stewart from Solar sister Nigeria delivered content on personal selling as part of this session.

Prior to the delivery of this session on entrepreneurship, the participants had participated in live sales session during the experiential field trip in Kayole through ESVAK. They had been paired with ESVAK women entrepreneurs to sell clean cook stoves made by Envirofit. This sales exercise was on the 17th, the same day that the participants had visited the briquetting making organization. The class lessons on entrepreneurship were therefore based on this experience and the case studies during the entrepreneurship training were the cook stoves and the briquettes.

The delivery of this module was enhanced through the use of games for learning



Providence and Trishala, 2 of the ToT participants selling cook stoves with ESVAK entrepreneurs

A site visit to Burn manufacturing in Ruiru(annex 4,b) provided good inspiration on the business opportunities available in the production and sale of clean cook stoves. Burn manufacturing are a company that manufactures energy saving jikos and are one of the first to make the energy saving jikos locally.

Open Exhibition

On the 3rd Day of the training during the delivery of the module on clean energy and entrepreneurship, an open exhibition was held at the training site. A selected number of clean energy products producers and suppliers (Annex 3) presented their technologies to the trainees. These were: D.light Limited, Ecozoom, Burn Manufacturing, Cookswell Jikos and Kibera Women's group making charcoal Briquettes.



Participants interacting with the exhibitors

4.6 Module 3: Environmental Stewardship

Dr Thenya Thuita of the University of Nairobi delivered this course with Prof Karanja Njoroge, Dr Mworia, Dr Cecilia Onyango and Mercy Karunditu of Green Belt Movement.

The objectives of the 3rd module were that by the end of the course, the participants would be able to:

- Define and identify natural resources
- Define sustainable, management of natural resources
- Describe and discuss the links of natural resources, energy, environment and livelihoods.
- Impact ethics and values on environment management
- Foster environmental stewardship.

Some of the highlights:

Human activities are the major factors leading to natural resource degradation among others. Environmental stewardship therefore requires that there is need for change in human behavior for sustainable development. *“We are not against cutting trees but we are for responsible use of trees and all other natural resources: Prof Karanja Njoroge*

While planning for natural resource management in communities around a natural resource, there is need to identify the needs of the communities and prioritize them. Allow sustainable use of the resource. In community involvement, it's important to share both the benefits and the costs.

Environmental stewards need to create social movements to mobilize communities and to impact on communities so that we reduce greed for immediate returns and increase love for long term benefits for the whole community.

The module was further delivered through experiential field trips to:

- KENVO and GBM sites in Kereita forest on the 22nd of July to see community forest restoration efforts. Site brief in Annex 7
- Community forestry at a GBM site in Muranga visited on the 24th of July
- Community forestry at GBM Bamboo Biomass and entrepreneurship project. Site Brief in Annex 9



Samuel Kariuki One of the participants and a Green belt Movement (GBM) staff member explaining about the GBM Bamboo biomass project

4.7 Module 4: Developing and Delivering content

Prof David Mungai, the deputy director Wangari Maathai Institute together with Prof Kiama, the Director Wangari Maathai institute, delivered the module. During this delivery of this module, Participants were grouped into their respective countries/organizations so that they could start planning together how to take this training forward.

The objectives of the 3rd module were that by the end of the course, the participants would be able to:

- Identify and apply appropriate training techniques and learning styles at the grass root level
- Carry out training needs analysis. Several aids and tools for this purpose are described, including training needs workshop to bring together a cross-section of clean energy entrepreneurship stakeholders
- Design, deliver and evaluate a training course
- Understand and apply the art of instilling values, inspiring and mentoring others
- Use demonstrations, demonstration sites and case studies to impart knowledge and skills to grass root clean energy entrepreneurs
- Understand and apply participatory teaching and communication skills

Prof. Mungai presented the lecture on training techniques and learning styles especially because the participants will be training adults and it is critical to think through how adults learn best. He emphasized the need to give practical examples, keep them involved and show how the training relates to their lives. He engaged participants in an activity that helped them further understand in their context adult learning techniques.

Characteristics of adult learners identified by the participants based on their context

- Most of them are illiterate or semi- illiterate and could be slow in learning
- Mostly women and not formally educated with minimal exposure
- Like that they values should be respected
- They like to be involved
- They need to know the importance of the learning based on their day-to-day learning.
- Humorous groups
- Adults want freedom e.g. retired teachers.
- Speak with authority and confidence and they love to share from their experiences.
- There is need to respond to their body needs
- Need to express their opinions
- The schedule should favor their time and there should be breaks

Training techniques that could be used in the participants context

- Team teach or the use of core presenters
- Use of visual aids and demonstrations
- Group discussions
- Brain storming
- Listening and being involved
- Use of energizers
- Success or inspirational stories
- Location and environmental matters
- Music and dance
- Eye contact is very essential



Participants learning through a game.

Prof Kiama presented the lesson on training needs analysis, course design and delivery and participatory evaluation. He started by provoking the participant's to think through why they attended the training. Its important to critically think through the training needs. He highlighted that the purpose for this training was

- To impact knowledge so that the participants could go and train others
- To impact Skills
- To change behavior and attitudes
- To make the participants change agents.

The participants were implored upon by Prof Kiama that after the training, that they would design an appropriate course targeting the community and the trainers they intend to train in their specific countries. The should be keen to incorporate the components as delivered in this training. Prior to conducting the training, it is important that they do a need analysis and that the training and needs analysis would be done in context of the program objectives.

Prof Mungai concluded the training through the delivery of the sessions on the art of instilling values, inspiration and mentoring. Among the important values discussed were: Integrity, transparency, accountability, responsibility, role model, humility, and self respect. The video screened at the beginning of the training 'taking roots the vision of Wangari Maathai was screened during the delivery of the fourth module and used as a case example on inspiring others and instilling values. Participants evaluated their view of the video clip at the beginning of the training and the view of the same clip at the end of the training with many of them stating that they are more inspired after going through the training and they now feel as part of the work that she started.

5. CONCLUSION

5.1 Action planning

Participants took the time after the delivery of the modules to reflect on what they will do regarding the training when they go back to their countries . The participants were grouped in their respective organizations for this exercise. The output of this was the action plans.

Action Plans

CARE (Kenya, Rwanda, Tanzania)	
<p>Care has existing village savings and loans groups (VSL) each having about 15 to 30 members Care in the 3 countries has about 1,000,000 members participating in village savings groups</p> <ul style="list-style-type: none"> • Care targets a total of 3,200 entrepreneurs across the 3 countries, they have already identified 591. The 591 will be trained based on what the participants have learnt in the course as its different from what they have trained before. The ToT's trained will further train others . • Brief management on learning as a way to solicit their support both financial, material and in stakeholder mobilization .This would be done the week after the training. 	<ul style="list-style-type: none"> • Have a planning meeting • Develop training curriculum appropriate for their context • Budget for training • Identify site for exchange visits • More emphasis will be put on module 2 • Creating awareness on Briquettes • Sensitize communities on tree planting through the VSLs in collaboration with the various ministries, Green Belt Movement – establish tree nursery , forestry . • Biogas (Rwanda) great potential as zero grazing is used as a government policy. • Review meeting to share learning • Networking with each other

<ul style="list-style-type: none"> Meeting with other care project staff and other stakeholders to brief them on what they have learnt 	<ul style="list-style-type: none"> One year time line
Women for Women International (WfWI)	
<p>1. Share experience with all members of staff</p> <ul style="list-style-type: none"> General staff meeting Play video on the legacy of Maathai Wangari to all staff to instill inspiration and passion <p>2. Organize TOT</p> <ul style="list-style-type: none"> List the stakeholders Identification of women group to be trained (about 800 women each from Nigeria and Rwanda) Organize training need assessment with the use of group discussion Prepare the handout/Materials Prepare the methodology Give the TOT(about 40 trainers each from Rwanda and Nigeria) <p>3. Follow up to measure impact</p> <ul style="list-style-type: none"> Baseline evaluation tools by the M and E Follow up field visit to monitor training Send report of progress to partners Evaluate the trainings <p>4. Linkage to potential market</p> <ul style="list-style-type: none"> Seek for potential partners in helping women group projects Clean Energy advocacy and establishing MOU with potential partners <p>5. Training Manuals review</p> <ul style="list-style-type: none"> Review our Business training manual using the training received Incorporate lessons from this training to the manual with emphasis to sustainable clean Energy 	<p>6. Editing Materials of wPOWER</p> <ul style="list-style-type: none"> Edit the materials with the trainers after the TOT Send soft copies of the edited materials to all trainers to be used as a reference material <p>7. Briquette making</p> <ul style="list-style-type: none"> Asses the availability of briquette raw materials for briquette production in the communities(papers, charcoal dust, soil etc) Organize and train the trainers in the briquette making skills Trainers train the women with the skills their received Do market assessment and link women to the market opportunities and possible funders for the procurement of equipment for the production <p>8. Work with partners : Solar sisters</p> <ul style="list-style-type: none"> Sign an MOU with solar sisters/Care International(Rwanda)(this has been done in Nigeria) Select women entrepreneurs Train women in partnership with partners entrepreneurs in entrepreneurship skill with special emphasis in marketing of sustainable energy products
Solar Sister (Uganda, Tanzania, Nigeria)	

<ul style="list-style-type: none"> • Share information with internal staff and management • Entrepreneurs, local community leaders , community will be trained on what has been taught in this course in their different forums. • Devise a method for evaluation of Solar Sister and impact on community Evaluation – solar sister, communities trained • Prepare a budget for this work . • Implementation of what they have learnt such as briquetting , tree planting – start with course participants <p><u>How they will do this</u></p> <ul style="list-style-type: none"> • Physical presentations • Written reports • One on one with staff and country director 	<ul style="list-style-type: none"> • Zonal district and state and local government meetings will be forums to pass on the information • Joint meeting with head of youth • Hold discussions with ministry representatives • Ensure constant feedback across the partners and how this is being done • Put in place measures on how the implementation will be done. • The additional aspects as learnt from this training will be done concurrently with Solar sister work because of budget constraints • Have officially trained ToT • Constant site visits • Recommendations from experts and others on the appropriate trees for which communities. • Close follow up with other stakeholders • Share success stories
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Green Belt Movement (GBM)

<p>The implementation of this will be through different levels</p> <ol style="list-style-type: none"> 1. Within the Mac Arthur funder project 2. Within each of the GBM's grant 3. Whole organization <ul style="list-style-type: none"> • All the grants to have the aspect of clean energy and entrepreneurship as a core element • Every staff to be able to pass this information in their work • Within the Mac Arthur grant , GBM targets to train 300 ToTs drawn from different areas to further train 20,000 group members who will further have impact in their respective households hence about 200,000 community members. The first ToT will be in September 2014 and at least one ToT a month each taking about 15 to 20 days • Develop a demonstration site at the Langata training center site to further facilitate the training 	<ul style="list-style-type: none"> • Emphasize on <ul style="list-style-type: none"> - leadership - Environmental stewardship - Clean Energy <p><u>How they will do it</u></p> <ul style="list-style-type: none"> - Use video of Prof. Maathai - Humming bird story - Use experts on – leadership - Site visit - Use local sites for field visits - Exchange visits - Share information with the entire wPOWER team - Use of games for training. - Technology <p>Make Clean energy a very key part of the organization. The 3 legged stool has just been having 2 legs with a lot of concentration on it(Environment. Leadership), They will now make clean energy as</p>
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<ul style="list-style-type: none"> • Hold Stakeholder's workshop - Religion leaders - Government - Ngo's 	<p>the 3rd leg.</p>
<p>Swayam Shikshan prayog (SSP)India</p>	
<p>SSP already has a model of training clean energy entrepreneurs. In addition they plan to:</p> <ul style="list-style-type: none"> • Introduce the Environmental stewardship model especially the story of Wangari Maathai, showing the video and learning from the video. It's a model that they will retrain the entrepreneurs that they have already trained. • On Energy section, introduce briquettes training and manufacturing. • Connect all these to Food security Sustainable energy, health environment which give livelihood opportunities such as the Bamboo Biomass project that serves many purposes for both environmental conservation and has many entrepreneurship opportunities. 	<p><u>How they will implement this</u></p> <ul style="list-style-type: none"> • Creating awareness campaigns • Conduction training in 2 ways: Training of trainers and exchange and site visits (exchange events) including connecting with government programs such as forestry • Connect the work with religious festivals, as there are so many of them. During these festivals, SSP would introduce the importance of trees and connect it to what already exist

5.2: Evaluation

Both verbal and written evaluations undertaken at the end of the workshop pointed to the achievement of the objectives of the workshop. Verbal evaluations were also undertaken through recap of previous day's training on some of the days.

On the overall training evaluation the participants rated the training well in terms of relevance with an average of above 4.4 in a scale of (1-lowest to 5- Highest) for the four modules

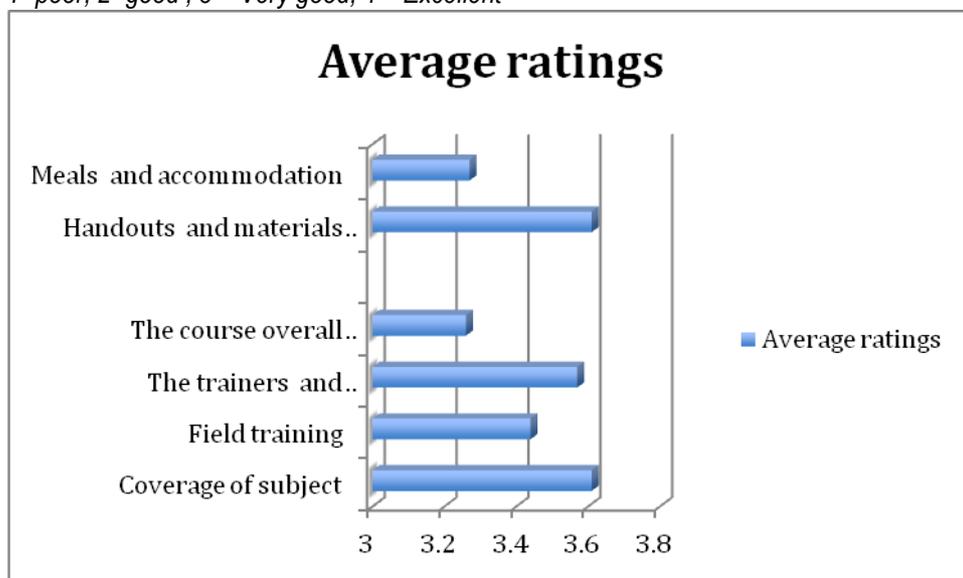
This is further demonstrated in the detailed and positive responses received when participants were asked to comment of key points and knowledge learnt from each module. This is reflected in the following sampled responses: ***A good leader should be passionate. In entrepreneurship, its important to sell benefits and to know the communities profile, the need for community involvement and participation for good environmental stewardship.***

The evaluation confirmed that the key objectives of this training as detailed by Prof Kiama had been achieved which was :the transfer of knowledge and Skills , change of behavior and attitudes and to make the trainees change agents and that they would transfer the same to their communities. Participants when asked to comment if they were prepared to conduct the course and how the course changed their attitude/behavior toward the environment, 95% answered in the affirmative with some of the comments confirming this. They include: ***“As a leader I need to take an initiative in empowering***

and sharing knowledge gained with my community” “I have learnt to train entrepreneurs” “ I need to bring change in my community” Cleaner technologies help reduce environmental pollution .

On the general assessment about the training based on coverage of subjects, field training, the trainers and facilitators, the course overall organization and time management, handouts and material provided, meals and accommodation, the average rating was 3.46 which is very good

1- poor, 2- good , 3 – Very good, 4 – Excellent



The field visits were well rated for relevance with the average rating for all the sites being above 3.5 on a scale of 1- for lowest and 5 highest). This is further demonstrated in the reflections and participants voices below during one of the morning recaps.

“Kirinyaga Micro hydro was Simpler than I thought” “Karura Forest a good model for community engagement in Natural resource management” “Strength in voice of community in Karura” “ Inspired by children singing about the environment in Esvak as its not common in Nigeria for children to be taught on environmental conservation” “It was very practical especially the briquette making process”

Sample Email feed back after the training from participants and others

Email feedback

Dear Wanjira and team,- August 25th 2014

The experience at the training of trainers (TOT) course on sustainable clean energy entrepreneurship workshop has been extremely enriching and insightful. The training was very well structured and the methodology adopted to conduct the training made the training very interesting and enjoyable. Adopting the learning from the workshop we are working on improvising our clean energy entrepreneurship training curriculum with insights from the leadership story of Wangari Maathai and inculcate the culture of planting trees in our communities . Specifically, we are looking adapting the methods for briquette production, which we were exposed to during field visits.

Our team and me, are thankful for this experience shared at the ToT workshop and look forward to inviting you when we host an international knowledge transfer event in India, early next year..

Thanks and Regards

Upmanyu Patil

Project Director (wPOWER)/USAID India

Dear All,

Thank you very much for the wonderful afternoon spent at your forest in Karen - it was very nice to show and demonstrate our branch charcoal kilns and do a bit of baking.

All the best, and again, many thanks from the Cookswell Team.

Teddy

Cooks well Jikos.....one of the exhibitors – July 16th after the open exhibition

Dear team,
 I traveled back safely and now and in Kampala. I will be on the bus in the next 2hrs for Mbale- which is another 4hrs drive, but I felt I just began missing you.
 For me, those two weeks were mind blowing. It was a period of confirmation to various ideas that I had thought about and written, and now there is a fire burning inside of me- it might once in while send some smoke to your offices, but please understand that you will greatly contribute to its later cleanliness and sustainability. An old adage my dad told me goes- *"a young man who does not associate with elders is like a tree without roots"* *you constitute the tap root in this fight to environmental sustainability and entrepreneurship.....
So am going to Mbale, promulgate an actual action plan then get going. There is an African saying that goes *"the mother of twins has to sleep on her back"* Prof. Wangare Mathaai did so... I pray that am able to emulate. I will be sending you updates as they come.
 Thanks
 Wetaaka Gerald
 SOLAR SISTER REGIONAL ASSOCIATE

Dear Terry,
 How are you doing? Hope this message find you well. I am also doing well. Work have began and i am starting to go on field next week to identify my women entrepreneur that i will be working with. I have met also with the guys distributing De Lights, envirofit products. I am meeting next week with Ecozoom distributor. You can see i am really excited to meet my target in wPower.....
 Take care!
 Providence MAVUBI
 P.O Box 2631 Kigali

5.3 Graduation Ceremony

The Training of Trainers course was crowned in a colourful closing ceremony that was filled with celebrations together with the participants –now graduates, other invited guests including representatives from the partner organizations .The guest of honour being David Drinkard Ag. Economic Counselor, American Embassy in Kenya.

The host of the graduation Ceremony, Ms Wanjira Mathai the wPOWER Hub project director invited all the guests and graduates to the celebration and reflections of what had happened in the previous two weeks. A very inspiring video clip with the highlights of the two week’s training was played with the background music from Donna Summer’s song *the power of one* setting the stage for further reflections and celebrations. Green Belt’s Movement Langata Training centre hosted the graduation ceremony with a sumptuous dinner with Kayamba Africa entertaining guests.

Ms Aisha Karanja the executive director of the Green belt Movement who was the key note speaker passed the vote of thanks to all those who made the training a success. She also together with all the trainees – Graduates took a pledge declaring their intention to get the work done. Jane Opito gave a speech on behalf of the graduates. Njoki Njehu gave a speech on behalf of the trainers and guest speakers

Prof Kiama, the Director of the Wangari Maathai institute for Peace and Environmental studies (WMI) in his speech recognized and thanked the guest of Honour, the state department and partners for having faith in WMI to serve as the hub to add value to them through training their students. The guest of honour David Drinkard gave his remarks further reinforcing the commitment of the State department to continue supporting projects such as wPOWER towards economic empowerment of women. He encourage participants to share their work and success stories with the embassies in their various countries. To crown the graduation ceremony, all the graduates were issued their certificates. Trainers as well as those organizations that facilitated the site visits were appreciated with the issuance of certificates of appreciation. Jedidah Wanyeki the vice Chair of the Green Belt Movement gave the final vote of thanks and further challenged the graduates to make sure they plant a tree when they go back to their regions and that they keep to the pledge they had made.



Guest of Honour David Drinkard Ag. Economic Counselor, American Embassy in Kenya. After issuing a certificate to Jane Karuga of GBM. With them is Ms. Wanjira Maathai, Director wPOWER Hub

Graduation Ceremony Participants

Graduates	All other Guests	
Upmanyu Shankerrao Patil	Prof. Stephen Kiama	
Laxmikant Vasantrao Malvadkar	Wanjira Maathai	
Jayshri Ram Kadam	David Drinkard	
Trishala Sunil Dangare	Prof Charles Mulei	
Shanta Prabhakar Gawali	Prof David Mungai	
Lilian Muchungi	Njoki Njehu	
Jane Karuga	Solange Impanoyimana	
Alice Wanjiru	Stephen Kinyanjui	
Samuel Kariuki	Ms. Aisha Karanja	
Paul Thiong'o	Dr. Mary Njenga	
Angeline Adem	Peter Fella	
Providence Mavubi	Charles Mwangi	
Nsanzamahoro Polycarpe	John Watkin	
Francine Mukaruberwa	Songela, Francis	
Sarah Mbuya	Thomas Elliot	
Soster Kizigha	Miriam Chege	
Glory Tarimo	Aisha Karanja	
Gerald Wetaaka	Cyrus Kimamo	
Jane Opitto	Jedidah Wanyeki	
Blessing Ekanem	Caroline Gertsch	
Clement Obayi	Mary Alice Onyura	
Mary Onoja	Benson Ochiel	
Oforneke Nnamdi Emmanuel	Terry Githinji - Kariuki	
Juddy Angaya	Catherine Lucey	
Robert McAyoo	Neha Misra	
Anne Ater	Teresa Maina	
	Janet Ndoro	

6 ACKNOWLEDGEMENTS

The development and delivery of this Training of Trainers course has been made possible through the generous support of the US Department of State, Bureau of Oceans & International Environmental & Scientific Affairs under grant number S-LMAQM-13-CA-1146 with parallel support from the MacArthur Foundation through their funding to the Green Belt Movement. Their support has enabled the creation and scaling up of the wPOWER hub at the Wangari Maathai Institute for Peace and Environmental Studies (WMI) at the University of Nairobi, Upper Kabete Campus.

The delivery of this course was made possible through a dedicated team of trainers and guest speakers. Their expertise and passion for this course were evident throughout the training. We convey our gratitude to Dr Mary Njenga of ICRAF, Prof David Mungai, Deputy Director Wangari Maathai Institute. Njoki Njehu Daughters of Mumbi, Solange Impanoyimana Resonate Rwanda, Stephen Kinyanjui, Rt. Bishop Peter Njenga, Jechoniah Kitale SNV Netherlands Development Organization, John Kapolon Practical Action, Daniel Wanjohi Global Alliance for Clean Cook stove, Peter Fella Amani Institute, Caroline Gertch Amani Institute, Becca Schwartz Solar Sister Nigeria, Dr. Thuita Thenya University of Nairobi, Prof. Njoroge Karanja Friends of Karura Forest, Dr. John Mworio University of Nairobi, Mercy Karinduti Green Belt Movement, Dr. Cecilia Onyango University of Nairobi

Sincere appreciation is also extended to all the organization and Individuals that participated in the open exhibition and gave their expertise, resources of time, money and personnel and an array of their clean energy products. Our gratitude goes to Cookswell Jikos, Burn Manufacturing, Ecozoom, Dlight solar, Mary Special thanks are extended to all the organizations and individuals who made the site visits possible by welcoming the participants to their sites and providing onsite training. This goes to Mwamko Foundation in Kahawa Soweto, ESVAK in Kayole, Karura forest, Uhuru park freedom corner, Practical Action, Thima Micro hydro power project in Kirinyaga, KENVO and Green Belt Movement for Biogas technology field visit and Kireita forest visit, Green Belt movement Muranga sites.

Our sincere gratitude goes to Green Belt Movement Langata Training centre who provided a conducive environment for the training and offered meals and accommodation for the 2 weeks. It was such a pleasure being there for the 2 weeks.

None of this would have been possible without the support of the entire wPOWER staff team: Prof Kiama Gitahi, Ms. Wanjira Mathai, Mr. Benson Ochiel Ng'ielia, Ms. Terry Kariuki Githinji, Ms. Lillian Kong'ani, Ms. Janet Ndoro and Ms. Rosemary Kadali.

The overall leadership, guidance, facilitation and support for the Training was provided by Prof. Stephen Kiama the wPOWER Academic Director and Ms. Wanjira Mathai the wPOWER Project Director.

7. ANNEXES

ANNEX 1. Details of ToT participants (Trainees)

TRAINING OF TRAINERS PARTICIPANTS – TRAINEES.

	NAME	GEN DER	ORGANIZATION	PHONE NUMBER	EMAIL ADDRESS
	INDIA				
1	Upmanyu Shankerrao Patil	M	Swayam Shikshan Prayog	+918605016700	upmanyupatil@gmail.com
2	Laxmikant Vasantao Malvadkar	M	Swayam Shikshan Prayog	+919423774727	mlaxmikant@gmail.com
3	Jayshri Ram Kadam	F	Swayam Shikshan Prayog	+919158689986	Kadamjayshree76@gmail.com
4	Trishala Sunil Dangare	F	Swayam Shikshan Prayog		pratikdangare@gmail.com
5	Shanta Prabhakar Gawali	F	Swayam Shikshan Prayog		gshanta8177@gmail.com
	Green Belt Movement Kenya				
6	Lilian Muchungi	F	Green Belt Movement	+250722923136	lmuchungi@greenbeltmovement.org
7	Jane Karuga	F	Green Belt Movement	+254722870314	karugaish2@gmail.com
8	Alice Wanjiru	F	Green Belt Movement	+254725897343	amwangi266@gmail.com
9	Samuel Kariuki	M	Green Belt Movement	+254728488881	skariuki@greenbeltmovement.org
10	Paul Thiong'o	M	Green Belt Movement	+254720996673	thiongowakihato@yahoo.com
	Rwanda				
11	Providence Mavubi	F	Care International	+250788688132	samprovy@gmail.com
12	Nsanzamahoro Polycarpe	M	Women for Women		
13	Francine Mukaruberwa	F	Care International	+250783780076	mukafrany@yahoo.co.ke
	Tanzania				
14	Sarah Mbuya	F	Solar Sister	255787449864	habibahenry@yahoo.com
15	Soster Kizigha	M	Care International		sosterkizigha@yahoo.com
16	Glory Tarimo	F	Care International		glorytarimo@hotmail.com
	Uganda				
17	Gerald Wetaaka	M	Solar Sister		wettgerald@gmail.com
18	Jane Opitto	F	Solar Sister		Jayne.opitto@gmail.com
	Nigeria				
19	Blessing Ekanem	F	Solar Sister		blecyn5@yahoo.com
20	Clement Obayi	M	Solar Sister	+2348174972316	clement.obayi@yahoo.com

21	Mary Onoja	F	Solar Sister		marypeteronoja@gmail.com
22	Oforneke Nnamdi Emmanuel	M	Women for Women		noforneke@yahoo.com
Kenya					
23	Juddy Angaya	F	Care International	+254727296799	kavitsa@gmail.com
24	Robert McAyoo	M	Care International	+254720801150	rmcayoo@gmail.com
25	Anne Ater	F	Care International	+254729485339	Anne.ater@gmail.com
26	Angeline Adem	F	Care International	+254726039170	ademangeline@gmail.com

Alice Wanjiru Green Belt Movement Kenya



Anne Ater, Care Kenya



Blessings Ekanem, Solar Sister Nigeria



Clement Obayi, Solar Sister Nigeria



Francine Mukarubera, Care International Rwanda



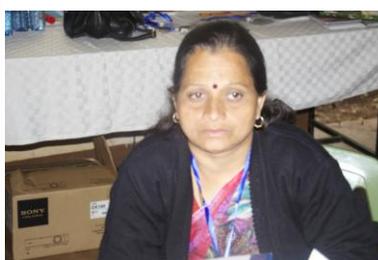
Gerald Wetaaka, Solar Sister Uganda



Jane Opito, Solar Sister Uganda



Jayshri Ram Kadam, SSP India



Juddy Angaya, Care Kenya



Mary Onoja , Solar Sister Nigeria



Oforneke Mndi,women for Women International Nigeria



Paul Thion'go, Green Belt Movement Kenya



Polycarpe Nsanzamahoro,Women for Women International, Rwanda



Providence Mavubi, Care International , Rwanda



Robert McAyoo, Care Kenya



Samuel Kariuki, Green belt Movement ,Kenya



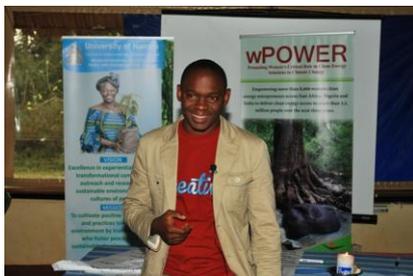
Sarah Mbuya ,Solar Sister Tanzania



Shanta Prabhakar,SSP India



Soster Kizigha,Care International Tanzania



Trishala Sunil, SSP India



Upmanyu Shankerr,SSP India





wPOWER Hub STAFF

NAME	GEN DER	ORGANIZATION	PHONE NUMBER	EMAIL ADDRESS
Prof. Stephen Kiama	M	Wangari Maathai Institue	0722380971	Kiama123@yahoo.com
Wanjira Maathai	F	Wangari Maathai Institue	0721376186	wmathai@greenbeltmovement.org
Benson Ochiel	M	Wangari Maathai Institue	0723677050	bochiel@greenbeltmovement.org
Terry Githinji - Kariuki	F	Wangari Maathai Institue	0721321316	terrygithinji@gmail.com
Janet Ndoro	F	Wangari Maathai Institue	0721849002	kuijanet@gmail.com

(Others In Attendance Day - One)

NAME	GENDER	ORGANIZATION
Songela, Francis	M	wPOWER Care International
Thomas Elliot	M	New Course
Miriam Chege	F	Green Belt Movement
Aisha Karanja	F	Green Belt Movement
Cyrus Kimamo	M	Green Belt Movement
Jedidah Wanyeki	F	Green Belt Movement

Benard Muthiani	M	Care Kenya
Mary Alice Onyura	F	ESVAK
Cynthia Elicius	F	wPOWER Tanzania

Annex 2 : Trainers and Guest Speakers

Trainers and Guest Speakers

NAME	GEN DER	ORGANIZATION	PHONE NUMBER	EMAIL ADDRESS
Njoki Njehu	F	Daughters of Mumbi	0737626946	daughtersofmumbi@gmail.com
Solange Impanoyimana	F	Resonate Rwanda		impano2008@gmail.com
Stephen Kinyanjui	M	Green Belt Movement		
Rt. Bishop Peter Njenga	M		0720256543	
Dr. Mary Njenga	F	ICRAF	0722331006	m.njenga@cgjar.org
Jechoniah Kitata	M	SNV Netherlands Development Organization		jkitala@snvworld.org
John Kapolon	M	Practical Action	0721350905	
Daniel Wanjohi	M	Global Alliance for Clean Cookstove	0722481012	dwanjohi@cleancookstoves.org
Peter Fella	M	Amani Institute	0735432027	peterfella@amaniinstitute.org
Caroline Gertsch	F	Amani Institute		Caroline.gertsch@gmail.com
Becca Schwartz	F	Solar Sister Nigerai	+2348145736 318	Becca@solarsister.org
Dr. Thuita Thenya	M	University of Nairobi	0721471082	tthenya@yahoo.co.uk
Prof. Njoroge Karanja	M	Friends of Karura Forest	0729030303	njokaranja@gmail.com
Dr. John Mworira	M	University of Nairobi	0728938236	kjmworia@yahoo.com
Mercy Karinduti	F	Green Belt Movement	0711347117	mkarunditu@greenbeltmovement.
Dr. Cecilia Onyango	F	University of Nairobi	0715606563	
Prof. David Mungai	M	University of Nairobi	0714745481	mungaidavid@uonbi.ac.ke
Prof. Stephen Kiama	M	Wangari Maathai Institute	0722380971	Kiama123@yahoo.com

Annex 3: List of Exhibitors

List of Exhibitors

NAME	ORGANIZATION	PHONE NUMBER	EMAIL ADDRESS
Julien Wachira	d.Light Ltd	0708725444	julieniwachira@dlightdesign.com
Caroline Matilu	Ecozoom	0708628341	caroline@ecozoomstove.com
Slyvia & Gertzel	Burn Manufacturing	0714794560	Gerzel.shivachi@burnmfg.com
Teddy Kinyanjui	Cookswell Jikos	0714794560	cookswelljihose@gmail.com
Patrick Vitenya	Cookswell Jikos	0700380009	-
Monica Sonyai	Cookswell jikos	0711360034	msonyani@gmail.com
Mary Mutola	Kibera women group	0721420740	-
Eunice Ambani	Kibera women group	0726200660	-
Jenifer Aoko	Kibera women group	0727840018	-
Ruth Ambani	Kibera women group	0728016671	-

Annex 4: Site Briefs

a) Bamboo Biomass & Entrepreneurship Project, Murang'a, County

Background:

Energy access is a massive development challenge in Sub-Saharan Africa. Less than 7% of rural households in Kenya have access to electricity, and more than 90% of the rural population depends on firewood for cooking and heating. Harvesting of firewood, and production of charcoal is a huge and growing threat to Kenya's indigenous forests and biodiversity, with currently less than 2% closed canopy forest remaining.

For the foreseeable future Kenya will need access to sustainable sources of firewood, charcoal, and other forest products at a massive scale, if any natural forests are to remain. Bamboo is a cash crop with many uses and benefits: rapid growth, high income potential, source of firewood and easy to convert to charcoal. Standing forests of bamboo also capture carbon, and slow climate change.

In partnership with Waterstone (Norway), the Green Belt Movement has established a bamboo biomass and entrepreneurship project aimed at promoting the planting of indigenous bamboo for: conservation, climate mitigation benefits, fuel source (firewood and charcoal) and economic opportunities through green businesses for and by local communities. The Green Belt Movement-led project has been very well received by the community.

The opportunity for Bamboo as a source of biomass energy is immense and the biomass benefits of bamboo are impressive: from the same acreage, bamboo gives 4.5 times more biomass than eucalyptus. The rapid turnover and consequently high production of biomass makes bamboo suitable as feedstock for cooking stoves. Bamboo is renewable and can be used on degraded land. It also lends itself very well for energy plantations because the heating and burning value of bamboo is also high. It has been estimated that for the next 40 years in Africa, biomass energy will continue to be a major part of the energy equation. Success in this area, therefore, will necessarily have to include alternative biomass feedstock for firewood and charcoal production. Green biomass can indeed be viewed as a source of renewable energy.

The planning, networking and concept development of the bamboo project has been ongoing for more than two years. The first phase of the project is focused on promotion and use of bamboo charcoal as a sustainable energy option and cash crop for local communities.

The Green Belt Movement has allocated 5 acres of land for a pilot, in Murang'a, north of Nairobi for the bamboo pilot project. Initial research showed the suitability of using the solid-stemmed bamboo, *Oxytenanthera Abyssinica*. It is well-known and accepted locally for its qualities regarding construction, fencing, charcoal and nutrition. We will be visiting the site of the bamboo plantation project in Muranga.

Bamboo species surviving

Plot/species	<i>Oxytenanthera abyssinica</i>	Tulda	Giant Bamboo
Block197	410	100	64
Block168	867	-	16

ACHIEVEMENTS:

Post planting care

- ❖ Replacement of dead seedling using rhizomes from fast growing seedlings
- ❖ Spraying of anti-termite agent (organic)
- ❖ Watering the planted trees during dry months
- ❖ Spot weeding and line weeding
- ❖ Mulching planted trees to control weeds and conserve water ,
- ❖ Slashing the planted area between rows.
- ❖ A tree nursery has been established and is being managed by the women

Security enhancement

- ❖ Fencing of block 1/168 and 1/197 plot.
- ❖ Construction of sanitary facility in block 1/197 plot.
- ❖ Construction of security structure in block 1/197 plot.
- ❖ The project has support from local administration

Challenges

- ❖ Erratic rainfall in the region hence watering must be done
 - Watering is labor intensive (project is located in the leeward side of the Aberdares)– women ferry water on their backs and heads especially in block 1/168.
- ❖ The bamboo seedlings are expensive.
- ❖ Bamboo seedlings are not locally available
- ❖ Lack of technical knowhow on laboratory procedures for tissue propagation.
- ❖ Poor soil- procurement of manure to address the nutrient deficiencies in the soil

Lessons learnt

- ❖ Bamboo seedlings are succulent and most attractive type of grass to the rodents. Cow dung can be used successfully as rodent repellent (a discovery made by the women who are doing post planting care).
- ❖ It's easier to propagate bamboo seedling using rhizomes compared to the culms.
- ❖ Intercropping reduces exposure of the bamboo to havoc by rodents and insects by diverting their attention to the other crops.

b) Burn Manufacturing

BURN Manufacturing Co. ("BURN") is a C-Corp that provides a market-based approach to address the global challenges of deforestation, advanced respiratory illness, global warming and poverty. By manufacturing and selling 3.45 million clean burning biomass cookstoves in East Africa over the next 10 years, BURN will save families €1 billion, reduce CO₂ emissions by 25 million tons, reduce indoor air pollution among users by up to 90%, and save 9,106,000 MWh of thermal energy. BURN will also create more than 200 sustainable design, manufacturing and sales jobs.

BURN was created to address the enormous need for high-efficiency cookstoves in the developing world where nearly 3 billion people rely on biomass fuels such as wood, charcoal and dung for cooking (WHO, 2011). The burning of biomass in inefficient cookstoves and open fires produces life-threatening smoke. This year, 574,000 people in Africa - mostly women and children - will die from respiratory diseases related to indoor cooking smoke (WHO). Cooking with traditional biomass fuels also accounts for

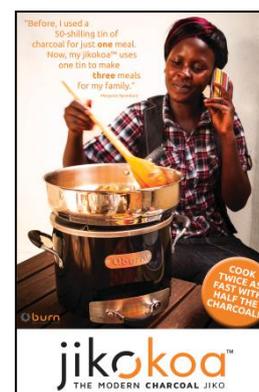


approximately 18% of current global GHG emissions if forest degradation and deforestation are included in the equation (SEI, 2008). Firewood and charcoal production are the largest drivers of deforestation in Sub-Saharan Africa, responsible for more than 52% of all forest loss.

Although the burning of biomass for cooking has huge social and environmental costs, it also offers an enormous market opportunity as there are over 23.5 million potential stove consumers in East Africa currently spending up to €375 each year for fuel. These households have a strong financial incentive to purchase a BURN stove, such as the *jikokoa*TM (right) that reduces fuel costs by as much as €187 each year.

The *jikokoa*TM, BURN's launch stove, is a revolutionary natural-draft charcoal stove that offers best-in-class performance. In the spring of 2013, Berkeley Air Monitoring Group conducted household trials that demonstrated a 45% reduction in median fuel consumption as compared to the KCJ - the existing *improved* charcoal cookstove in Kenya - and a concurrent 65% and 63% reduction of carbon monoxide and particulate matter emissions respectively.

Leading distributors in Kenya such as The Paradigm Project, Living Goods, and MicroEnergy Credits have selected the *jikokoa*TM as the #1 stove in terms of price, performance and user satisfaction after comparing charcoal stoves currently available in the East Africa. BURN's user-centric designs are aspirational products that are sold wholesale through proven distribution networks.



Since the product launch in August 2013, BURN has sold more than 20,000 *jikokoa*TM cookstoves through 130 distribution partners, 50% of those in the last 2.5 months. Sales increased seven fold from January to March in 2014. As of May 2014, BURN is selling a stove every ten minutes in Kenya. In March, BURN began selling the *jikokoa*TM in Equity Bank, Kenya's largest bank, with more than eight million customers. The *jikokoa*TM is the only product sold through Equity Bank. If current sales at BURN's ten Equity locations are extrapolated to all 170 branches in Kenya, it will equate to **11,475 stoves per month**. BURN is also selling the *jikokoa*TM in four of the top six supermarkets (72 retail outlets as of March 2014) in Kenya. When BURN scales to all branches of these supermarkets, it represents **3,532 stoves per month**.

BURN's roll out strategy is split into two phases, Phase 1, assembly of stove kits in Kenya, and Phase 2, full manufacturing in Kenya. This strategy has allowed for a quick start up with low upfront investment, around €35k for the assembly line versus €350k required for Phase 2. Phase 1 also provides BURN a working template for future satellite assembly plants. During Phase 1 stoves are sold at a negative gross margin due to the high cost of sourcing stove components offshore. During Phase 2 (September 2014 onwards) BURN transitions to 100% local manufacturing thereby lowering the cost of goods sold by approximately €6 and generating 39% gross profit. BURN becomes net income positive in March 2015 by selling 7,000 *jikokoa*TM stoves and 2,000 of the new FDS stove (FDS launch date: January 2015). The FDS features a solar powered fan that burns agricultural waste or wood as clean as natural gas for 10% less cost per cooking event.



Phase 1 operations started in August 2013 when BURN installed its first stove assembly line in Nairobi. In March 2014, BURN moved the assembly line to a new 18,000 ft² manufacturing facility in Ruiru, Kenya where the Phase 2 manufacturing facility will be constructed around the existing line. When fully commissioned in September 2014, this facility will be able to produce a stove per minute as well as producing kits for assembly in satellite facilities in Uganda and Tanzania (2015), and Rwanda (2016). Through

this venture, BURN seeks to demonstrate that lean, in-country manufacturing can reduce costs compared to offshore production methods and that modern clean cookstoves can be sold commercially in East Africa. Once proven, BURN intends to expand throughout Sub-Saharan Africa.

BURN is led by founder and CEO Peter Scott, one of Foreign Policy Magazine's Top 100 Global Thinkers. He is recognized as one of the leading experts in cookstove commercialization. Mr. Scott leads a team that brings more than 100 years of design and manufacturing experience to the cookstove space. BURN's award-winning approach is unique in the cookstove industry. By owning all stages of the design and manufacturing value chain – R&D through sales – BURN is able to bring new stoves to market faster than the competition.

c) Esvak Community Development Initiatives

1.0. History and Background

ESVAK (Ex-Spring Valley Kayole) is a Community Development Organization founded in August 2001. The establishment was initiated by Mary Alice Onyura, who was later joined by a group of Christian women with a calling to champion the development and empowerment of poor children within their communities. ESVAK was founded in response to finding a lasting solution to the problem of re-integrating street children and sometimes, street families. ESVAK's work with rural communities is partly aimed at containing rural orphans within their own communities thus forestalling their eventual displacement. The quality education programme with the rural communities has seen ESVAK expand programmes aimed at empowering women groups in the relevant communities through activities such as capacity building, formation of self help groups for income generating activities and eventually micro-credit and micro-loans.



ESVAK handing over ESVAK Community School to the community leaders

2.0. Target Group

ESVAK targets women, youth and vulnerable children in urban slums and marginalised rural communities.

ESVAK PROGRAMMES AND THEIR EFFECTIVENESS

3.0. A Participatory Approach to Development:

ESVAK believes that it is difficult to empower a community or a group of people who have not yet identified their needs. In this respect the organisation only works with communities which have initiated some 'development' and taken the courage to invite others to facilitate them to identify their problems and recognise fruitful ways of trying to address them. This approach ensures that the community can sustain their activities after ESVAK's exit. *People will sacrifice more for what they have played part to create, than for blue print plans handed down to them for implementation from 'experts'.* Mulwa (2008: 18).

3.1. URBAN SLUM COMMUNITY DEVELOPMENT AND EMPOWERMENT

This has been ESVAK's largest programme in Nairobi. The target slum is Spring Valley Kayole, with a current population of over 10,000 people. The slum is situated in the Kayole area, home to several slums. The development which ESVAK has facilitated is testimony to how effective Development Aid can be if local grassroots initiatives and participation are encouraged. Such cooperation must appreciate participation of the local NGO partner and the target community, which in turn must result in satisfying fundamental human needs: physical, social, psychological and spiritual needs. Right from inception ESVAK emphasised to the community the fact that no one can develop them; a community can only develop itself and ESVAK can only facilitate the process. Nyerere (1973) argues thus...*But people cannot be developed; they can only develop themselves... by what they do... by making their own decisions... and by their own full participation – as equals.* The community has worked tirelessly to ensure that they realise their objectives towards development and empowerment. There is currently a very strong community leadership headed by a Development Committee. In partnership with ESVAK they have achieved the following:

- Building the Capacity of Community Leaders
- Facilitating the Community to Claim Right to Land Ownership
- Water for Health
- Quality Education
- A Revolving Micro-credit Scheme Fund
- Empowering OVCs and the Youth for Employment

ESVAK targets the bottom 10-20% of the population as exist in the urban slums and marginalised rural communities.

d) Karura Forest

Title of Best Practice	Protecting an urban green space for the community
City/Town	Nairobi
Country	Kenya

Background

The remarkable Karura Forest Reserve is the second largest urban forest in the world fully within a city limits (second to one in Toronto, Canada). It covers 1,040-hectares and is a shining example of how individuals, governments and corporates can jointly serve to secure and protect natural resources. The forest offers a refuge from the bustling city of Nairobi for Kenyans and visitors who want to walk or jog, or simply to sit quietly and experience the serenity of nature in all its diversity.

Previously, the forest made headlines for all the wrong reasons: crime and land-grabbing. In the late 1990s the Green Belt Movement Founder & 2004 Nobel Prize Laureate Wangari Maathai led a spirited and sustained multi-year advocacy campaign to protect the forest from unscrupulous politicians and their greedy allies who had allocated land to themselves for palatial residences. Fortunately due to civil society engagement and the personal dedication of Wangari Maathai, Karura Forest was saved and became a symbol of transformative leadership and the struggle for environmental conservation. If not for Professor Maathai's determination and bravery, the trees and their ecosystem would not be there today.

Today, Karura Forest is slowly building a reputation that is spreading beyond Kenyan borders. It has become a success story that has inspired other cities and their environmental struggles. School groups and more than 8,000 individuals visit the forest every month.

History:

During the pre-colonial period, a private family owned Karura Forest. The family surrendered the forest to the British Government on condition that it remained forest land. Small experimental forest plantations using various Eucalyptus and Cypress species were made in Karura Forest in the early 1900s. When Eucalyptus was found to grow at extremely fast rates, the indigenous forest cover was reduced over the years and re-planted with Eucalyptus plantations. The wood was used as fuel for the railways, poles to carry electrical wires, and for the construction industry.

During the independence struggle, the caves of Karura Forest were used as hiding grounds by the Mau Mau freedom fighters. The caves are now considered sacred and have become a unique feature for visitors to the forest.

Impact of Wangari Maathai's Transformative Leadership

Karura Forest has much to offer today and many who enjoy it know little about its history and the difficult journey, led by GBM and Prof Maathai, that led to its eventual protection. Some of the wonderful elements that make Karura special are:

Natural Beauty: Karura forest's landscape rolls gently between and through shallow valleys with amazing beauty: a 20-meter waterfall, several rivers, an archaeological site, caves, marshlands and serene groves of secondary and primary indigenous trees. It is also known to host a variety of animals. These include the Harvey's and Grimm's Duikers, Bushbucks, Bush Pigs, Genet Cats, Civets, Bush Babies, Porcupines, Syke's Monkeys, Ground Squirrels, Hares and the Epauletted-Bat and some 200 bird species have been seen in the forest.

Youth Education: More than 4,000 students visit the Karura Forest Environmental Education Center every month. At the Center, children have an opportunity to learn about environmental stewardship and sustainable development outside of the classroom. The Center is supported by the Karura Forest Environmental Education Trust (KFEET) whose founding members are: Kenya Shell Limited (Vivo Energy Kenya), Kenya Forest Service, the Green Belt Movement (GBM), Friends of Karura Forest Community Forest Association and the Oshwal Education & Relief Board. UNEP acts as an Advisor in the Trust.

Community Involvement in protecting the forest: In 2009, residents of neighbouring estates established the Friends of Karura Forest (FKF) - Community Forest Association to assist Kenya Forest Service in the management of the forest. At around the same time, the Karura Forest Environmental Education Trust was established by key stakeholders to convert the Shell Sport Club into a leading

education centre on the environment. Thanks to the efforts of these stakeholders, over 8,000 people are now enjoying walking and learning in the forest monthly.

The Education Centre: Karura Forest has quickly become an example of the emerging Kenyan Green Economy. There is now a new facility to promote environmental education, conservation, and citizen engagement. There is a process currently underway, and with support from the UN Environment Program (UNEP) to build a sustainable educational facility to enhance the educational experience.

Other Allies in Protecting Karura Forest

After Prof. Maathai's relentless effort to stop the illegal allocation of Karura Forest, she needed the support of others to make the final push. Some of those allies were critical to ensuring that the forest was eventually secured and enriched for public use. Some of these were:

Alice McCaire, the wife of the then UK High Commissioner got the key people concerned in government around a table; UNEP, bordering the forest, had a stake both as a neighbour and as the leading international governance body for environmental protection, **Achim Steiner, the UNEP Executive Director;** the **Kenya Forest Service** that gave this initiative a chance; the **2005 Forestry Act** which included a new legislation that for the first time allowed communities to come together and apply to manage the forests they lived around, and the local **residents associations** who came together to form a CFA. The resident associations around Karura Forest did not need much convincing that Karura was an important asset to the city of Nairobi, the **business sector in Kenya** had been doing well and raising the money to build the fence (all from Kenyan companies) wasn't too difficult – **East African Breweries offered to pay to fence the entire forest, and Barclays bank offered to pay for uniforms and salaries for new Scout/Rangers until the facility** broke even, the security firm **G4S**, stepped up to offer a further security backup and training, the **British Army** offered to **train the scouts** and at the same time do the ground works in Huruma Slum village> The work in Huruma almost overnight transformed a scrub area previously used to dump rubbish and as an outdoor lavatory into a **playing field**. The playing field is a valued community resource.

Initially very few people visited the forest – its previous reputation had been bad. Every day the Friends of Karura and GBM encouraged reluctant people to come on tours of the forest. Gradually the numbers grew and a large publicity campaign around our first public event in the forest drew approximately 1,000 people and enthusiastic press coverage. The then Prime Minister himself was Guest of Honour at the official launch of the initiative – the Karura Forest scout rangers mounted the guard of honour.

The Future: Success brings its own problems dealing with larger numbers of visitors every day. But the momentum is tremendous, and if those with stewardship of the Forest can navigate these challenges, Karura Forest will continue as one of the premier attractions of Nairobi, become self-funding, sustainable, greatly expand the areas with replanted with indigenous species, a site of education on forests and ecology for Kenya's schoolchildren and other visitors, and a source of revenue for local low-income communities.

Her Excellency, Margaret Kenyatta - Kenya's First Lady inaugurated (date) the initiative to build the Karura Forest Environment and Education Centre – using a combination of the old Shell Sports Club buildings and a new modern building now under design.

We continue to have a strong governance structure under the excellent Chairmanship of Professor Karanja Njoroge and with the various individual and institutional stakeholders continued commitment.

e) Mwamko Foundation

BACKGROUND INFORMATION

The above named organisation was formed some four years ago by a group of young people all residents of Kahawa Soweto slum. It was formed by members of another previous youth group by the name Soweto Youth In Action (SOYIA) whose majority of members became dormant in performing the group activities. Mwamko was formed by the remaining active members of that former group. Today the organisation is made up of **12** members both male and female with their main activities being based in Soweto and Kamae slums of Kahawa area.

MAIN ACTIVITIES

1. Children's Educational Program
2. Children' Mentorship Program

3. Drugs and Alcohol abuse Rehabilitation Program
4. Briquette Manufacturing

Briquette Manufacturing

History of the project

The project was initiated by those active members of the former group, SOYIA after they were taken through a vigorous training exercise of the same under the support of URBAN HARVEST/ICRAF. After the training, the same organisation supported them to acquire the necessary equipments to start the project.

Progress Report

So far the project is ongoing being run by members of Mwamko who organised themselves in units each specialised with a specific task. They include collection of raw materials, production and sales. The organisation is also actively involved in training other groups and individuals from different places in briquette production at a fee. There is a small space and a few equipments used in all these activities.

Benefits

This activity has brought several benefits to different groups of people and individuals. Some of the benefits includes:-

- Environmental care since most of the raw materials used in production have previously been thrown away as waste and so causing pollution.
- The economic standards on members involved have improved
- The local community consuming the product has also benefitted a lot since all parties involved especially the consumers have proved that briquettes are much more economical and environmental friendly fuel as compared to other types like charcoal, firewood, paraffin, electricity, gas e.t.c.
- There have been positive reports coming in from those groups and individuals who have been trained through Mwamko.

Challenges

Despite all the benefits, difficulties have also come along way. To mention a few of them includes:-

1. There is still not enough space and equipments to do both production and training. There is only a very small space which was offered by one member which is used for both.
2. Marketing is still being done in the old ways through word of mouth. The organisation has not been able to modernise it due to some difficulties like lack of access to print and audio media, lack of proper product packaging and branding to be sold in big supermarkets, and also these members lack modern marketing skills.
3. There is a problem of transport in both raw materials and the finished product.

Future plans

1. To make it grow into a big industry which will offer more employment opportunities to people from this area? This will be possible if situations on space and equipments are improved.
2. To develop much on the marketing capacity through proper advertising, proper product packaging and branding. There also need to publicise much on the benefits of using the product since there is still a big number of people who are not aware of it.

Children's Educational Program

This is a program which involves learning both in pre-primary and primary schools. Currently the centre is based at Kamae slums. There are **50** children from needy backgrounds attending classes on daily basis and over **100** on the waiting list.

Benefits

1. Children from poor backgrounds who lack the capacity to enrol in formal schools can access education.

2. Parents to these children are able to go out to work since the burden of having to stay with their children has been taken away from them.

PROJECT VISSION

Create a much aware society on environmental care and economic friendly way of living.

PROJECT MISSION

Take on board every member of the community to embrace this kind of fuel for their day to day household activities.

CONTACTS:- EMAIL: mwamkofoundation240 @gmail.com/ mwamkoyouthfoundation @gmail.com

CO-ORDINATOR : MILCAH MUTHONI CELL PHONE - 0729 369637

EMAIL: milcahwaigwa @ gmail.com

SECRETARY: JAMES MWANGI: CELL PHONE - 0729 804075

EMAIL: jimwasumbi26 @ yahoo.com

f) Renewable Energy: Household Biogas

Title of Best Practice	Household Biogas by Kijabe Environment Volunteers (KENVO)
City/Town	KIMENDE
Country	Kenya

Background

Located between 0°50' and 1°40' S and 36°35' and 36°43' E in Kiambu County, the Lari-Kijabe Landscape is part of the larger Kikuyu Escarpment landscape that lies on the eastern slopes of the Aberdare Mountains of Central Kenya. The landscape is approximately 442Km² with a human population of 123,895 persons (2009, Census).

The climate is largely influenced by altitude; however the landscape is divided into two agro- ecological zones, the lower and the upper highland zones, with altitude varying from 1760m above sea level in the lower zone to 2610m a.s.l in the upper zone respectively. The land is purely an agriculture zone and the agricultural practices are rain dependent. (Mwangi J.N. and Mutua J.M). Soils in the landscape are highly fertile, very deep, well drained, dark reddish brown, strongly calcareous and saline in many places. The soils have high organic carbon content (3-4%), which reflects high level of applied organic matter, low nitrogen, while phosphorus levels remain average (Makokha Stella, Kimani Stephen et. al). There is use of both organic matter and inorganic fertilizers for soil fertility.

Forest covers about 37,000 ha with 13,000 ha located in a different landscape. The highest percentage of this forest is natural indigenous forest and a small section of exotic tree plantation for timber production. The forest is designated as an Important Biodiversity Area and listed by Birdlife International in the highest category "critical" for conservation action (Bennun and Njoroge 1999). It hosts a variety of important global species and is particularly rich in bird life. It is home to 140 bird species, 20 of which are considered rare ("BirdLife", 2007). The forest is an important community asset which has been a main source of forest products including water, fuel wood, herbal medicine, fodder for livestock, building materials as well as leisure space. The forest is an important catchment area that supplies water to the Kenyan capital, Nairobi (Kuria and Githiru 2007). Despite this importance of the forest, it has in the past faced major challenges among them deforestation as a result of unsustainable human activities such as charcoaling, timber logging, uncontrolled firewood collection, encroachment (during the Shamba-system era), uncontrolled grazing among others.

Over the years the Kijabe Environment Volunteers (KENVO) a local CBO has engaged the local community towards conserving the forest for its biodiversity and biological importance as well as for the livelihood improvement of the local community. So far, the community has been able to eliminate illegal timber logging and charcoaling. However firewood consumption and grazing in the forest today remain as major threats to the forest, thus KENVO is promoting use of biogas as a way of addressing both grazing in the forest and use of firewood. This is done through training dairy farmers to adopt zero-

grazing as a farming practice from which they can then construct biogas digesters and have clean energy supply at the household level. The organization has done this by establishing demonstration households where other members of the community can learn from.

Description of the biogas project

The project involves supporting dairy farmers to install biogas digesters for the production of biogas as an alternative source of energy at the household level which is renewable. This is for demonstration purpose to showcase that zero grazing can be more productive than grazing in the forest. Grazing in the forest has been a major challenge to forest rehabilitation efforts being carried out by KENVO and other groups such as the Community Forest Associations. Further use of biogas shall also enhance use of organic fertilizer to enhance food production of horticultural crops which is a major agricultural activity in the area. This shall be done through use of slurry emanating from the biogas digester. Thus use of biogas shall contribute to conservation effort including reduction of carbon as well as in enhancing agricultural production. Use of biogas will also supply cooking energy to households reducing firewood sourcing from the forest. The beneficiaries are selected from within the project area who include past beneficiaries of zero grazing units as well as farmers who have adopted zero grazing as a modern method of dairy farming. KENVO provides all the materials and skilled labour required for the construction of the biogas except for the timber and the unskilled labour which the farmer provides. Each farmer is selected from an organized group so that other members of the group can learn from him/her.

Outcomes of the Best Practice and sustainability

The Biogas digester is 8M³ provides cooking gas for about 3 hours in the morning and 3hrs in the evening with most farmers using it for about an hour over lunch hour. This has greatly reduced the amount of fuel wood used at the household level with some farmers completely stopping to use fuel wood at all. For those who are still using some amount of fuel wood/charcoal it's mainly for warming the house especially during this cold season. In terms of financial cost saved, an average size household used at least one load of fuel wood per week which costs Kshs.300 (\$3.5) translating to about Kshs.1,500 per month. In addition there is no more smoke in the kitchen thus contributing to good respiratory and eye health. In terms of environmental well-being, use of biogas reduces the amount of methane gas released to the atmosphere from livestock waste. Methane is one of the greenhouse gases that contribute to depleting of ozone layer. In addition the bio-slurry from the digester is used for organic farming, thus further reducing the use of inorganic fertilizers hence improving soil fertility. So far 14 farmers have benefited from this initiative.

Lessons Learned

It is important to create direct link between conservation and the day to day livelihood of the community in order to achieve both conservation and development goals. It is also important to have a participatory process from the project design stage to implementation, monitoring and evaluation. This creates a sense of ownership not only to the output but the ownership of the goal the project is trying to achieve since the community members are fully involved in identifying the problems as well as possible solutions.

Best Practice Transferability

The purpose of this initiative was to pilot and demonstrate that use of biogas is viable in the area and can be used to address both conservation and livelihood issues. This is transferable and scalable, however most of the average rural families cannot afford the technology since it is expensive especially when using the fixed digesters which is more suitable in this area. Alternative financing is thus important. It would also be important to link farmers who are using biogas to other income sources such as carbon credits as the initiative is contributing to reduction of greenhouse gas emission, both carbon and methane.

g) Micro-Hydroelectric Project Pico hydro project -Thima Site

Area of coverage	<ul style="list-style-type: none"> The scheme serves 165 households dotted within an area of 1000m²
Source of water	<ul style="list-style-type: none"> River Rutui, near kerugoya town. The river has a flow rate of more than 100l/s during 90% of the year
The Average cost	<ul style="list-style-type: none"> Ksh.720, 000. Community contributed over half of this money, transmission poles and labour. The average cost per household is \$58
Scheme output	<ul style="list-style-type: none"> 2.2kw with shaft extension of 3.3kw. The electrical output of 2.2kw corresponds to a turbine-generator efficiency of 45%
Technical Summary	
Head	<ul style="list-style-type: none"> The net head is 18 metres and flow into the turbine is 28 l/s
Intake	<ul style="list-style-type: none"> The intake is more than 80m³ water storage. The water source is small spring, with flow rate of 5 litres per second.
Penstock	<ul style="list-style-type: none"> The Penstock is 90 metres length, 160mm diameter and made of PVC pipes. The flow rate into turbine is 8.4 liters /second
Turbine	<ul style="list-style-type: none"> The scheme uses water pump as turbine directly coupled to a generator.
Power house	<ul style="list-style-type: none"> This building houses the pump-as-turbine and generator equipment and ensures that the water is returned directly to the river. It is built above flood level but otherwise close to the riverbank. The location was chosen to maximise the available head whilst minimising the penstock length. A draft tube was added to the outlet of the pump to obtain an extra 1metre of head. Extra floor area was added to the building since the intention is to use the far end of the generator shaft to drive a 'posho' (maize) mill. Double-ended generators such as this can
Generator	<p>The scheme uses an induction motor-as-a-generator and produces about 2.2 kW. but a shaft extension provides a 3kW drive for mechanical loads. The generator output is regulated by means of an induction Generator Controller to control voltage and frequency.</p>
The Ballast	<ul style="list-style-type: none"> Excess power is fed to a ballast load. Two 1.8kw cook rings were used for that.

Transmission and distribution system	
Cables	• Single -phase distribution system with insulated copper conductors. The transmission and distribution lines comprised of multi-stranded and insulated copper wires of 6mm ² (transmission) and 2.5mm ² (distribution) lines respectively.
Poles	• Poles measuring 25ft and a diameter of 6 Inches at the base and placed between 30 -45 meters a part. Both poles were acquired locally. Poles mostly from Eucalyptus Species.
House wiring/Tariffs	§ Household use 8w energy saving bulbs § There is a socket to run appliances § Household pay between Ksh.100 -150 per month for power used. The household are fitted with
Beneficiaries	
Households	§ 165 households within an area of radius of 1000M ² are connected to the generator § Each house has 230V supply, sufficient one/two energy saving lamps and a radio socket. § 8 watts energy saving bulbs are used.