6th October (Day - One) – World Sustainable Development Summit

The RUWES Team attended the World Sustainable Development Summit themed Beyond 2015: People, Planet & Progress at the Indian Habitat Centre, Delhi. The summit inaugurated by President Pranab Mukherjee gathered global leaders, stakeholder governments, NGOs, multilateral and bilateral development organisations and academic and research institutions to encourage action to achieve goal proposed in order to protect the planet and explore new pathways that contribute to sustainable, inclusive and equitable future.

The RUWES Team attended the Thematic Session on Air pollution in India: A Problem with Scalable Solutions. The session aimed to target interventions in different sectors such as residential cooking and transport to reduce their contributions to the pollutant concentrations. It proposed to evolve a framework for the integrated role of science, policy, business and civil society for addressing air pollution concerns and indicate a pathway for emission reduction from different sectors. The broad objectives included the following:

- Catalyzing scientific research to mitigate PM and ozone precursor emissions from different contributing sectors. Key strategies that can work in reducing pollution in Indian cities and other highly polluted regions.
- Encouraging the policy makers to set time bound targets for air pollution mitigation.
- Factors impeding the focus on mitigation strategies for emissions from different sectors and actions needed to jointly address them.
- Immediate role of science, policy, business, financial institutions and advocacy groups and actions needed to drive their collaborated action.
7th October (Day - Two) – Visit to the Institute of Minerals and Materials Technology

Through the Ministry of New and Renewable Energy’s National Programme on improved Cookstoves (NPIC), the Indian Government has disseminated about 35 million varieties of cookstoves for domestic and commercial cooking. Keeping in view the advancement in cookstove technology and growing concern for energy security and health hazard concerns of women and children in rural areas, the Ministry of New and Renewable Energy launched the National Biomass Clean Cookstove Initiative (NBCI) for development and demonstration.

As a follow up to the NBCI four cookstove testing centres were established and certified by the Ministry of New and Renewable Energy. The testing centres are for carrying out performance testing of clean cookstoves and for developing test protocols and standards. One of these testing centres was set up in the Institute of Minerals and Materials Technology (IMMT). IMMT recognizes that a large percentage of the population depends on firewood for cooking and the already existing technologies cannot be fabricated by the villagers.

The testing centres have a testing programme for streamlining the process of testing and for developing revised standards and test protocols for portable improved biomass cookstoves to maintain the quality of products. On
the basis of extensive testing and analysis carried out in these centres, the MNRE developed a revised standard and test protocols for portable biomass cookstoves, recently published by the Bureau of Indian Standards, New Delhi.

The RUWES team was given a tour of the cookstove testing facility in IMMT, got exposure on cookstove testing, research on ICS designing and introduced to different technologies like the Improved Biomass Oven, Thermoelectric Cookstoves, Water filtration system, Biomass Fired Drier.

The team was briefed on NBCI and there is an expected follow up action proposed for partnership for the Institute to set up a clean cookstove testing centre in Nigeria through an existing partnership between India and Nigeria (spearheaded by the Ministry of New and Renewable Energy, India and the Renewable Energy Programme, Nigeria) on matters related to Clean and Renewable Energy.
COOK STOVE TEST CENTER
(National Biomass Cook Stove Programme)

Sponsored by
Ministry of New & Renewable Energy
Government of India
8th October (Day - Three) - Saturday

Visit to Saunta Gaunta Foundation, Keonjhar.
The Team was introduced to the climate credit scaling sustainably project. The project includes appointing energy entrepreneurs, mobilising funds and training on the application of the newly introduced cooking technology. The climate credit is designed to cover the cost of the stove and the sensor pack. Through this model, energy entrepreneurs carry out installations, monitor stove use and retrieve data, service and repair as well as purchase the devices from the manufacturers.

The scheme works in partnership with banks in agreement for a reduced interest rate after all relevant guarantees are provided by the entrepreneurs regarding upfront finance of products and repayment models.

The team then visited to Kontakoli village and interacted with the representatives of the communities regarding the usage, adoption of improved cookstoves and its impact on their health.
Thereafter, the visiting team met the Project Director, District Rural Development Agency, Keonjhar. He shed light on the role of government and his personal commitment going out of his way to allow something like this happen in a very remote location. The similarity between India and Nigeria is glaringly open in this regard because without personal commitment of such an officer will never come to light no matter how laudable it is. The Director, personally calls for meetings with local Banks and follows up on all government related processes and approvals to fastrack action. It is obvious that in every community, the cookstoves initiative MUST have a champion to succeed.
9th Oct (Day Four) - Visit to Gram Vikas

Gram Vikas “Village Development” is a rural development non profit organization seeking to promote processes which are sustainable, socially inclusive and gender equitable to enable critical masses of poor and marginalized rural people or communities to achieve a dignified quality of life which are measured by

- Assured access to basic education and adequate health services
- Sustainable use and management of natural resources
- Food security and access to secured livelihood opportunities
- Options for appropriate family and community infrastructure and sources of energy
- Strong self-governing people's institutions with equal participation of men and women

Gram Vikas operates by the MANTRA (Movement and Action Network for Transformation of Rural Areas) framework of development which includes 100% inclusion of households in the process of construction and mobilization of resources, Ownership and cost sharing, social and gender equality and sustainability. The main focus areas of Gram Vikas are;

- Water and Sanitation; this programme addresses the root cause of why rural populations remain impoverished. This includes empowering communities to construct, manage and maintain their own sanitation facilities. So far Gram Vikas has provided 100% Water & Sanitation coverage and adoption for 1,259 villages, 75,391 families and 402,759 individuals.
- Disaster Resilient/Social Housing; includes owner driven construction methodologies and practices. Gram Vikas facilitates both financial and technical support for building permanent, disaster-resistant houses for tribal and rural communities. So far 22,000 disaster resilient houses have been built.
- Skill Development/Livelihood/Capacity Building; this programmes is for the marginalized and vulnerable and enables them to increase income, employment and food security, while improving their health & nutrition. Gram Vikas has also undertaken interventions in areas of land and water management, improved agriculture practices, social forestry, horticulture, building micro enterprises and self-governance institutions in cases where agriculture and the existing opportunities are unable to absorb growing labour demand. So far 8,000 youth have been trained on varied construction skills, 30,000 hectare land under water shed treatment and 5,000 hectare under horticulture
- Education; Gram Vikas promotes and runs residential schools for rural children, especially coming grom tribal backgrounds, such schools provide well rounded educational facilities in the remote areas of Odisha. Gram Vikas provides support to a number of Day Schools with an emphasis on joyful learning in the rural areas. Sports and games activities have been included for holistic development of children, this has opened up many opportunities to nurture the sporting talent amongst its students

The RUWES team visited a community site of the Gram Vikas Water and Sanitation Programme, interacted with the community and was briefed on an innovation named Induced Gravity Flow method to provide safe and clean drinking water in indigenous communities in mountains without electricity.

The team was thereafter given a tour of the kitchen with demonstrations on Institutional Cookstove solutions in Gram Vikas School. The team interacted with National Level Athletes in Women Weighlifting in Gram Vikas Residential Schools.

During visit to Gram Vikas, the team met Mr Ramani Sankaranarayanan of CTx Green which works on Bioethanol based cookstoves and briefed the team on the technicalities of the stoves and possible proposals for the generation of bio fuel from agricultural products.
10th Oct (Day Five)

The RUWES team was welcomed with a civic reception organised by the members of the indigenous community in Sambhav and Notarpalli. The community is a typical example of forest conservation. All the 33 households in the community have switched over to improved cook stoves. The users of various cookstove models took the team in batches to their respective homes and shared their improved cooking experiences. Later on, the cookstove users' group named 'Shaktishalini' which means 'Energy Empowered Women' organised a workshop on making mud stoves for the RUWES participants. The RUWES women were taught how to mould clay stoves with single and double fire outlets. These mud stoves are to serve as a first aid for rural women who depend on the traditional methods of cooking and as a means of transition to clean cookstoves.

One of the striking experiences shared by the communities is the direct impact clean cookstoves has on health. A shift to clean cookstoves resulted in a reduction of incidences of respiratory diseases found among the new born because of the extreme smoky situation in the homes due to indoor air pollution.
11th Oct (Day Six) - Tuesday

Part of the objectives of the RUWES Initiative is to develop sustainable business models by providing the necessary tools (access to capital, skills and capacity building) needed to improve the rural woman’s sources of livelihood as well as create successful small businesses through Climate Smart Agriculture in rural Nigeria.

The consistent impact of climatic conditions such as drought, desertification and rapidly changing rainfall patterns impacts negatively on agricultural practices threatening food security. In view of that, the RUWES team met with Dr. Khalid Khan, Dean Orissa University of Agriculture and Technology. Dr Khan gave presentations on the latest agro-based value addition tools and machineries. He stated that agro processing has a tremendous potential for increasing income through value addition while eliminating polluting technologies and increasing shelf life and access to food security through the establishment of small scale agro processing enterprises and rural based industries.

He stated that the Orissa University of Agriculture and Technology will be open to collaborating with the RUWES Initiative and sharing best practices and technologies in agriculture.

13th Oct (Day Seven) – Visit to The Energy and Resources Institute (TERI)

The RUWES team visited the Solar Lighting Laboratory of The Energy and Resources Institute, Delhi and were introduced to various programs. Lighting Asia/India is a market-transforming program with the objective of promoting both the value and presence of modern off grid lighting amongst the off-grid population in rural India. The International Finance Corporation (IFC), a member of the World Bank, has partnered with TERI’s state of the art testing facility, Solar lighting laboratory for ensuring quality solar lighting products for millions of Indians with no access to grid power.
TERI’s Solar lighting laboratory tests solar lighting products from manufacturers based on procedures specified by the International Electro-technical Commission (IEC). This testing certifies products for international quality assurance, helping manufacturers produce affordable quality solar LED lights for end users in India.

The RUWES team was introduced to such testing procedures carried out by TERI’s Solar lighting laboratory. These include the following:

- Usability test – charging cycle, discharging cycle, battery capacity and device runtime
- Visual Screening
- Lighting Service – light distribution characteristics, variation of illuminance at surface and luminous flux.
- Durability test – drop test, vibration test, circuit protection test, switches and connections.
- Long-term Performance test – long-term lumen degradation test, long-term PV performance test, long-term battery performance test
- Testing and Characterisation of Battery – battery capacity test, battery efficiency test, charge retention test, endurance test, battery analysis under different climatic conditions.

Officers at TERI said the institute will be willing to training RUWES staff on the modalities and latest solar lighting testing procedures.
14th Oct (Day Eight)

The RUWES Team visited the Indian Institute of Technology in Delhi and had a meeting with the coordinators of the Biogas Development and Training Centre. The team had the privilege of being introduced to new stove technologies, a standard clean cookstove testing facility as well as clean energy fuels. During the visit to the testing facility, the team identified two stoves which we expressed our interest to include in our efforts to reduce emissions of SLCPs from cooking practices. The mini-moto stove and the thermo-electric stove designed by one of the female PhD students. IIT officials stated that they can assist RUWES with stove testing, lab testing as well as field testing. After discussions, it was mutually agreed that the best way to proceed is through a partnership between RUWES and IIT with Nexleaf Analytics serving as a mediator between RUWES and IIT.
In everyday life, energy plays a crucial role in providing options for cooking, transportation, education, health services, etc. However, there is a real gap in the provision of energy especially that of the rural communities where the availability and affordability of sustainable cooking fuel is a daily challenge. The use of open fires, traditional cookstoves and fossil fuels is one of the world's most pressing health and environmental problems. Globally, three billion people rely on solid fuels to cook, causing serious environmental and health impacts that disproportionately affect women and children. Yet, safe, affordable, and accessible clean cooking solutions exist that can dramatically reduce fuel consumption and exposure to indoor air pollution, while providing economic opportunities in communities around the world.

Clean cookstoves are designed to reduce the fuel consumption per meal and to curb smoke emissions from open fires. Clean cookstoves are efficient, allowing the stove’s users spend less time gathering wood or other fuels, reduces incidences of respiratory diseases prevalent in smoke-filled homes, while reducing deforestation and air pollution.

The RUWES Team conducted a needs assessment for the communities within the Federal Capital Territory due to its proximity to Abuja for ease of monitoring from international partners visiting. Rural dwellers are illiterate so they had to be given a verbal questionnaire to acquire information (such as means of cooking, fuel for cooking,
amount of money spent on cooking fuel, incidences of burns and respiratory illness) crucial to the implementation of the project. The responses received were positive and showed willingness to embrace the project.

The communities of Burum and Katamkpe are situated in the Federal Capital Territory, Abuja. Residents are rural dwellers and most households depend on agriculture for livelihood and over 95 % of rural households use wood based fuel (firewood or charcoal) as their primary source of fuel. This has led to heavy exploitation of forests and trees for firewood hence a danger to the water catchment area.

Communities in Katamkpe and Burum were selected because due to cultural traditions and the energy poverty prevalent in these communities, most households depend on firewood for cooking and heating purposes. This practice degrades our environment and is very inimical to the health of the women and children who are the most vulnerable to the effects of fuel wood burning. Replacing inefficient cooking, heating and lighting devices with clean alternatives can rapidly achieve development and energy access goals, save money and reduce climate warming. The projects in Katamkpe and Burum, Abuja, Nigeria are modeled after the projects in Keonjhar and Notarpali in Odisha, India, by transitioning rural Nigerian women from their traditional energy practices to clean household energy. It involves utilizing mobile technology and innovative finance model to help rural women afford clean cookstoves.

In line with RUWES criteria for participation in the project to reflect beneficiaries with the highest potential of positively impact in their communities, the Chiefs of both communities conducted the selection and screening of the 10 beneficiaries of the clean cookstoves. The selections of beneficiaries for this trail drawn from communities are those who have shown interest and meet the projects proposed target, especially ability for repayment and willingness to share skills and experience.

Twenty (20) of the available smart clean cookstoves (smart-stoves) have been installed in the selected communities (10 houses in Burum and 10 houses in Katamkpe). The smart-stoves were connected to sensors which transmit information on the frequency and duration of use via a mobile network provider that enable RUWES Initiative and Nexleaf Analytics Technical team quantify black carbon and carbon dioxide emission reduction in real-time. These information will then be translated into 'climate credits', which enable rural Nigerian women who are the users of the stoves get payments for using their stoves as a reward system for reducing black carbon.

CCAC MISSION TO NIGERIA

4th March, 2017; Visit to the Project Sites in Marraraban Burum and Katamkpe

The CCAC Household Energy Initiative and SNAP Initiative sought to ascertain the use and efficiency of clean cook stoves that have been widely popularized and adopted by rural populace in Nigeria through the activities of the RUWES and Nexleaf Analytics as part of the CCAC Knowledge and Solution Center intervention.

The purpose of the visit by the CCAC team was to collect enough information on project focus and scope of activities of the project in Burum and Katampe Communities as regards indoor air quality and SLCP emission reduction. The project is intended to create SLCP awareness and promote wide application and dissemination of clean energy technologies (improved cook stove), that are more efficient than the traditional stoves, improve the livelihood of rural Nigerian people and reduce Indoor Air Pollution in order to protect human health, mitigate climate change.

The meetings were held at the Palace of the Burum Chief, the Marraraban Burum Community Centre and the Community Centre Katamkpe. In attendance were representatives of RUWES Initiative, Nexleaf Analytics, Federal Ministry of Environment, Federal Ministry of Water Resources, Federal Ministry of Budget and National

If the project proves to be successful, it will be scaled up to include 100 households in rural communities within the country. Currently, two (2) indigenous clean cookstoves (Ecozoom and Musa Raymond stoves) will be tested to ascertain black carbon properties for inclusion in the project. The two manufacturers are currently in discussion with Nexleaf on testing requirements and procedures in Delhi.
CONCLUSION

The intervention of the Knowledge and Solution center came at the right time to provide guidance and direction to our in-country efforts for provision of household energy to rural Nigerian communities. The Technology exchange program between Nigeria and India clearly demonstrated what is possible as well as expose our rural women to technology neutral innovations that cut down SLCPs within households.

We are very grateful to the Nexleaf Analytics team for a very well planned and executed working visit. We had access to everything we wanted and they went all out of their ways to provide the practical trainings that the Nigeria Team Leader requested for several times. This ensured we fully understood and got value out the visit.

Furthermore, we finally cracked the code on innovative finance for clean cookstoves and how to stimulate interest of the Nigerian Banking sector on financing cookstoves for rural communities.

NEXT STEPS

- We are all very excited to have further cracked the code in providing clean household energy to our rural poor through market driven approach.

- Between May and June 2017, we intend to provide clean cooking and lighting solutions for 500 households as pilot as we launch the "Woman to Woman " clean energy Entrepreneurial initiative. This is by using the basic skills learned from the Indian rural entrepreneurs in addition to the new financial model developed in the absence of climate credits.

- Our ultimate target is to provide clean cooking and lighting solutions for 5,000 rural households by the end of 2017 through this new internal finance mechanism.

- This new internal finance mechanism for clean cookstoves and solar lighting will be implemented through the RUWES Woman 2 Woman Campaign which utilises clean energy entrepreneurs and rural women.
• We are at the final stages and we expect to begin installation by the second week of May.

We look forward to sharing the success stories and challenges (if any) with the coalition at the next working group meeting. Hopefully we can become a model for replication for other developing Partner Countries.

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Nigeria, Team Lead and National Focal Point, CCAC
26th April 2017