

Round Table On Renewable Energy as Sustainable Alternative: Prospects and Challenges

8-9th May 2015, Bhubaneswar, Odisha

**Partners: RCDC, Bhubaneswar and
Youth for Social Development (YSD), Berhampur, Odisha**

Background

India is a place of rich natural resources and it has great potential to accelerate the use of its endowed renewable resources to power its growing economy with a secure and affordable energy supply. It is also a fact that the Government of India recognizes that the development of local, renewable resources is critical to ensure that it is able to meet both its economic and environmental objectives. The Indian economy has experienced tremendous growth over the past several years. In order to continue the growth trajectory, India needs to address its



energy challenges, which cross all sectors and impacts all citizen. Electricity—both in terms of quality and access—is a key challenge. Much of India’s population is not experiencing the benefits of economic growth. The Government of India sees the provision of electricity to all as critical to inclusive growth. It recognizes off-grid renewable energy as a practical, cost-effective alternative to an expansion of grid systems in remote areas of the country. To be able to provide adequate electricity to its population, India needs to more than double its current installed capacity to over 300 GW by 2017. Also, India’s demand for oil in 2015 is expected to be 41% higher than in 2007 and almost 150% higher in 2030—needed primarily to feed a growing transportation sector.

The Objectives

Keeping above background in view, OXFAM India along with its partner organisations – RCDC and Youth for Social Development (YSD) - has organised a round table on prospects and challenges of renewable energy in India. The objectives of the workshop were:

- To take stock on the learning and experiences of the organizations working on the issue of renewable energy;
- To have a debate on how to make the opportunity of renewable energy accessible by the poor- constraints and enabling factors;

- To have a knowledge base on the role of different institutions involved in the area as well as exploring a space for engagement with the right and critical stakeholders;
- To find out ways of civil society engagement on the issue

Structure of the discussion

Based on the above objectives, four specific areas were undertaken to have a deliberation in the workshop such as:

- Current energy challenges and need for alternative energy;
- Lessons learnt from potentially replicable community models on renewable energy;
 - Protocol and practices of policy environment on renewable energy in India and
 - The role and possible agenda of institutional and non-institutional actors to take it forward.



Opening Session

The round table began with a welcome address by Akshaya Kumar Biswal, Regional Manager Oxfam India followed by deliberation of inaugural dignitaries: Prof. Yogender Yadav, Director, SSNIRE Government of India, Sri Panchanan

Kanungo, Former Minister and President Odisha Electricity Consumers Association, Odisha and Mr Aurobindo Behera, IAS (Retd.), Former Member, Board of Revenue, Odisha.

Key notes-I

- There is a need of renewable energy in the context of climate change and environmental degradation.
- Discussions on renewable energy take place among the elite experts while people suffering the impacts of climate change do not come into picture. Need for effective ways to take these discussions forward to the community level to create awareness and knowledge on cost and benefits calculation, know the needs of the region and involve the people at the grassroots in the production and consumption of renewable energy.
- Renewable energy is an integrated issue which should never be discussed in isolation.
- Technology is heavily dependent on energy as is many other conveniences as well as personal comfort. With depleting resources of fossil fuels and upon observing the impacts on climate change and environment we have to decide upon switching over to renewable energy.
- Looking into the low level of per capita consumption of energy in India, there is need to address the affordability and accessibility issues.
- The quest for renewable energy started as a consequence of the energy crisis of 1993 consequent to the oil price shock of 1990. Struck by these events, the USA started taking

steps to move towards renewable energy sources. However with the problems abating this discussion and initiative was abandoned.

- However, in this era of climate change we cannot consume fossil fuels indiscriminately without global consequences as we are contributing to global warming. In India we are rich in coal. Yet we are importing 20-25% of our needs from Australia. About 80% of the oil we use is imported. This puts immense pressure on foreign exchange reserves.
- There are high negative impacts of fossil fuel use in our cities. In New Delhi air quality has rapidly deteriorated. Electricity production is challenged due to the polluting effects of coal based energy. Excavation cost of coal is increasing. Mining is impacting health of people and environment. Quality of coal in Indian reserves is below standard and soon sanctions may be imposed on use of such low grade coal. Transportation of coal from mined areas to the thermal plants is also a problem.
- The energy crisis and climate challenge is forcing us to look at alternatives. We are now talking about renewable energy. Traditionally, Indians have made good use of both solar and wind energy. Now, the effort has to be organized and efficient using science and technology. Humans and nature should be close and respect each other. In developed nations also leaders and populations are talking about values.
- Today India is progressing in this field and is more organized. The Ministry of Renewable Energy is putting emphasis on this issue at the central level. Currently the share of renewable energy in India is only at 13 percent. Plan is to increase it to 17 percent by 2017.
- Total installed capacity for wind energy is 2200 GW in India. This is more than the global nuclear capacity. Solar energy is expected to go up to 700GW. Wind energy can increase to 100,000 GW if we can increase the height. Ministry has plans to go up to 1000,000 GW of RE.
- RE, if made affordable and cost effective, can improve the lives of rural poor.
- In agriculture, emphasis has to be given to bio-resources in developing RE. Technical costs are currently very high for bio-resource energy. We have to develop cheaper indigenous technology.
- The Government of India has started national institutes on solar, wind, bio-energy.
- Policies have to be framed to ensure people's participation.
- Sustainability of RE is an important issue. People's participation should be ensured to ensure sustainability.
- In case of Odisha, the state is lagging behind in the area of renewable energy. The electricity deficit in 2014 is claimed to be 14 percent but the reality it is different. Of the 96 lakh households only 56 lakh households have been provided electricity so far. The level of rural electricity consumers is only at 23 percent. Electricity losses due to theft and transmission are as high as 63 percent in the state. The voltage situation is also abysmal. Declared or undeclared power cuts continue. Thus, there is a need



to go for renewable, sustainable, decentralized micro systems, green energy, and small hydro projects. In solar both photo voltaic cells as well as thermal technology can be used in Odisha. People can get solar energy for 265 days a year for 5 to 5 ½ hours a day. Government of Odisha has conceded the fact that the share of renewable energy is only 2.3 percent in Odisha of which solar is 0.5 percent.

- For electricity, current consumption of India is 180,000 MW against the requirement of 300,000 MW – 40% is aimed to come from RE. The situation in Odisha today is that against requirement of 5-6000MW, production capacity is 2800-3100MW. The power scenario of Odisha is; Hydro - 41%, Thermal – 56%, and Others – 2%. The deficit has been 14% in 2014.
- Micro systems comprise only 2% in Odisha which should be increased. Macro systems are centralized and tend to get disturbed during calamities and stress.
- As Odisha is rich in mineral resources RE has been neglected. However overexploitation of coal will cause a crisis by 2030. Thermal power also needs large quantity of water for which agriculture suffers. The costs are high; Rs. 6 crores per MW. This scenario must wake us up about the need for RE.
- There is a need for more research in renewable energy sector with regard to bring down costs, increase efficiency, ensure sustainability, and to increase the quantum of energy use. The government needs to allocate adequate resources to expand the use of renewable energy for the community. There is need to subsidize the cost of using renewable energy.

First Technical Session – Current Energy Challenges & Need for Alternative energy

The first technical session started with Sri Ashok Srinivas, Prayas Energy Group, Pune and Mr Toine van Megan, Chetna Consulting, Auroville. Mr Megan presented on the overall issues with regard to energy sector in India and the steps needed to overcome the challenges. Various solar energy models were presented in this session. The session was chaired by Sri Ajay Jha.

Key Notes-II

- We cannot totally replace thermal energy as yet. Reducing personal energy footprint is also a part of the solution.
- 50% of population does not have access to efficient energy. While in 2001 78 million HH did not have access to electricity, the figure for 2011 is 75 million HH. It will take decades to remove energy poverty.
- RE is currently owned by the private sector and market.
- We have to think of ways to make RE people centric. Who will finance investment? Justice has to be incorporated.
- Energy has a close link with human development through enabling people to access to lighting, cooking, entertainment, refrigeration ; community services such as PHCs, schools, street lighting; livelihoods through small and large enterprises
- It has a linkage with macro factors through growth in GDP, imports, subsidies etc.
- It has also negative impact especially through conventional energy forms
- Key challenges are use of very low levels of modern energy, access levels improving but very slowly, rapid rising energy imports, low domestic resource base (of fossil fuels), extremely

poor social and environmental governance, global problem of climate change, limited carbon space for development

- The solutions should focus on providing affordable and reliable energy that should also be sustainable. Governance and management are important. The strategy should be to reduce 'luxury' energy use and inequity in energy use, improve technology to ensure efficiency and compliance to environmental and social standards, improve governance, ensure genuine competition to improve quality and lower rates, and steadily replace fossil fuels with RE.
- There are technical issues with regard to use of renewable energy such as variability of RE, managing grid stability with increased RE share, socio-environmental issues, fair processes for land acquisition / leasing, economic issues, affordability of RE, distribution utility finances, access / reliable supply
- The 'energy pyramid' was discussed based upon need vs greed. Do we need light bulbs during the day? Can we not use natural light (sunlight) instead of artificial light? We can use CFL's or LED's instead of incandescent light. We can increase our RE use and restrict fossil fuels as final resource only.
- According to a study, by improving plant performance and reducing transmission losses we can reduce coal consumption for energy by 75%.
- Consumers of energy can become Prosumers by also producing energy for personal use and also by contributing to the grid. The use of Smartgrid technology is recommended.
- In a Smartgrid the end users are judiciously connected to both the conventional energy grid and the various RE grids that may be locally set up.
- A model of domestic consumption of RE with an integrated grid for import and export at Auroville was extensively discussed for its usefulness and limitations. The models may be stand alone or hybrid. RE is seriously pursued at Auroville.
- The Tamil Nadu Government has examined and is seriously considering the Auroville models.

Second Technical Session: Potentially replicable community models on RE

The second session captured some of the community level models through a presentation by Sri Prashant Swain, TERI, Odisha and Mr. Goutam, Practical action. The session was chaired by Mr. Tirthankar.

Key notes -III

In the presentation, TERI presented their learning from the intervention titled 'Lighting a Billion Lives (LaBL)' which the organization facilitates to set up solar enterprises in energy poor villages that offer clean lighting solutions to the local people.

- The intervention had objectives to provide reliable and clean illumination that advances education, health and livelihood activities, catalyze rural solar market through creation of enhanced distribution network, equip local human resources with technical and managerial skill sets for operation and maintenance through training and replace the use of polluting kerosene as a lighting fuel.
- The delivery model of the intervention is as follows:

- A centralised charging facility is established wherein solar lanterns are charged and rented out by the village entrepreneur and served to interested users at the village level.
- The entrepreneur is responsible for safe keeping of system as well as reports on performance of SCS on regular basis to local cluster technician as well as TERI.
- The model is based on nominal fee-for-services. A nominal fee, say Rs. 2/- to Rs. 3/- per day is being charged in order to cover the maintenance expenses of SCS as well as remuneration of entrepreneur.
- In the ideal scenario, collection of monthly tariff of Rs. 60 per household per month can meet entire expenses out of which Rs 40/- (2/3rd of collection) is meant for maintenance and Rs 20/- (1/3rd of collection) for remuneration of entrepreneur.
- Challenges faced
 - Paying capacity of solar users is less for sustainable operation
 - Sustainable operation by local institution/entrepreneur is difficult
 - Conventional service providers (district level entrepreneurs) are not interested to provide service in remote areas
 - Local investment for replacement of appliances
 - It is still not the interest area of Banks and financial institutions
- Opportunities ahead
 - Support of Govt. through various schemes and convergence
 - Bank, active SHGs / Cooperatives can lead in promotion and dissemination in arranging funds
 - Corporate may adopt this technology in their periphery areas development programme
 - More participation of NGOs /civil society organizations can take up as one of the mainstream activities as this is new thrust area not only for lighting but all types of technologies



The models presented by the Practical Action were

- Small Wind Energy System for Rural Energy Access in Odisha
 - o First project of its kind in the state – The SOLAR & WIND hybrid system for rural and remote village electrification
 - o Training and empowering people and/ or agencies for scaling up, like, carpenter, fabricator, electrician, managers
 - o Enabling environment for community participation, ownership and contribution to the project
 - o Enabled village team for small repair and maintenance
- Sustainable Micro-hydro through Energizing Rural Enterprises and Livelihood (SMRE)

- Energy based enterprises are promoted for sustainability of the Micro Hydro Projects (MHPs).
 - Livelihood through energy based enterprises under MHPs
 - Participatory Market Systems Development approach in selection, planning and execution of enterprises
 - Market development & linkages for ensuring sustainability
- Micro Hydro Projects
 - Technical support for OTELP sponsored Micro-Pico Hydro projects
 - Exploring the cutting age technology from around the world and replicating in Odisha
 - Round the clock power availability for tribal community in remote districts
 - Capacity building to community for operation and maintainence
 - Access to clean cook stoves
 - Outreach for 5000 Households (projected)
 - In house R&D, Improved cook stove model designed
 - Capacity building for women entrepreneurs
 - 120 women from WSHGs directly involved (all from Tribal background)
 - Market linkage being established

Questions from Audience

- ✓ What is the cost per KW in wind energy? – Depends on the location.
- ✓ Any Government schemes? – We are trying.
- ✓ Do you conduct training for NGO's? - We have a consulting wing which imparts training for a fee.
- ✓ How can we scale up cook stoves?

Answers from the Panel:

- Identifying models is important
- The models have to be improvised to suit local needs and conditions
- Convection of air has to be ensured
- Hunt for models that can be assembled and repaired locally
- Technology involvement should be minimum
- Should be able to use locally available fuel

Thematic Session III – Renewable Energy policy environment in India: Protocol & practices

In the second day, there was a presentation from Thima Reddy, Chetna group and Prof. Yogender Yadav, Director, SSNIRE Government of India. The session was comprised with the policy issues related to the renewable energy in India

Key notes -IV

Following polices are relevant for the renewable energy sector in India

- The Electricity Act, 2003
- National Electricity Policy, 2005
- National Tariff Policy, 2006
- Integrated Energy Planning, 2006
- National Action Plan on Climate Change (NAPCC), 2008
- Jawaharlal Nehru National Solar Mission (JNNSM), 2009
- Low Carbon Strategies for Inclusive Growth, 2014
- There are issues related to the governance deficit, institutional capacity, lack of coordination among relevant departments etc.
- Involvement of Developers
- Lack of consumer or civil society organisations' involvement
- Public consultations in designing programmes would help in faster acceptance
- Under funded nodal agencies
- Need capacity building of nodal agencies and utilities
- Facilitation/providing comfort particularly for small investors
- Initiatives to tap resources including external/multilateral sources

Prof Dr Yogendra Yadav shared the following on the subject, Renewable energy as sustainable alternative: Prospects & challenges.

- Over 230 GW power generation capacities is mainly based on thermal and hydro with about 13% from renewable.
- Electricity supply will need to grow 5 to 7 times of its current consumption for sustaining growth of around 8% through next two decades.
- About 80% of rural energy consumption comes from non-commercial sources: about 320 MT of fuel wood, animal dung, agro wastes, etc.
- Only 45% of rural households use electricity. Even in electrified villages, supply is inadequate and unreliable. About 80 million households with 400 million people are without electricity and still use kerosene for lighting.
- India's power sector:
 - Total installed capacity 245, 273MW
 - Thermal 60%, Hydro 16.53%, Nuclear 1.95%, Renewable 12.93%, Gas 8.59%
 - India has one of the lowest per capita consumption of electricity at 911MW
 - Renewable energy: Wind 67%, Solar 3%, Small hydro 12%, Biomass 13%
 - RE: India has harnessed 11% of estimated potential
- Challenges:
 - Low Energy density and high initial investment with solar devices
 - Site selectivity and non-uniformity of wind speed
 - Remote location of the resources and high initial investment for construction of sites, problems in grid connection with small/ micro hydro
 - Low energy density, lack of scientific knowledge & proper technology, problems in combustion devices transportation, storage and market with biomass/waste renewable.
- Renewable power potential;
 - Wind power 100,000MW

- Solar > 100,000MW
- Small Hydro (up to 25MW) 20,000MW
- Bio-power 26,000MW approx
- Total – 245,880 MW
- At end of 12th Plan 2017 the total power generation capacity of the country is expected to be 318,800 MW.
- Drivers for RE in India
 - Demand for power and exhaustible fossil fuels increasing
 - Problems in meeting even minimum energy needs for cooking and lighting in many areas
 - About 80 million homes still without electricity
 - Power shortages felt even in cities and affect industrial production
 - Need to control GHG emissions
- Institutions of MNREI
 - National Institute of Solar Energy
 - National Institute of Wind Energy
 - SSS National Institute of Renewable Energy
 - Alternate Hydro Energy Centre
 - Solar Energy Corporation of India
 - Indian Renewable Energy Development Agency

Questions from Audience

Some of the questions from the audience also reflected their suggestions;

- What about adequate financial requirements for RE? This is a main constraint
- There is need for a better market mechanism
- What is the role of subsidies for organizations that want to talk about Microsystems?
- What is the role of community engagement?
- Biodiesel is not very efficient. There are global concerns with regard to bio-fuels
- What is the feasibility of achieving 100GW of solar power by 2020?
- What about fluctuations in grid energy?
- Which states have done better? What really moved there?
- What can the civil society do to change policies and bring in amendments?
- Policies should be consistent, innovative and people friendly.

Prof Yadav: These are good questions that have to be answered by the Government of India. The states are only implementing. Power evaluation needs regulatory control. Also quality of power is a problem. We have to come up with integrated systems that can look at the issue as a whole and provide all services. Market is at a low level now but it growing even if slowly.

Mr Reddy: I share concerns about finances. A good tariff structure will make people go in for RE. Certain proven technologies can be made mandatory. Provision for subsidies must be made in budgets. RE transmission continues to be a problem. Tamil Nadu has done well in wind energy. Wind density is good over there. Industrial houses now have captive plants. Gujarat is high in solar. They have clear and unambiguous policies. This is where civil society can work on in other states. Currently there is a lot of ambiguity. Issues have to be sorted out.

Thematic Session IV: Way's ahead: Role of institutional and non institutional actors

There were presentations of key findings from **group discussions** which were facilitated by Ms. Ranjana.

Discussion Points	Group-I	Group-II	Group-III
Challenges	<ul style="list-style-type: none"> - Lack of information on <ul style="list-style-type: none"> o different sources of renewable energy o how to do the renewable energy o what are the schemes available at the government o Cost benefit analysis for different sources - Market chain of the accessories is not established - Operational difficulties with OREDA - Past negative experiences on the renewable energy - Nodal agencies at the state level - Changing technology are not updated at the community level - Making a right choice out of the available technology - People are not consulted while products are selected - Lack of transparency while selecting vendors and pricing 	<ul style="list-style-type: none"> - Financing <ul style="list-style-type: none"> • Improve budgetary provision and subsidy for villages • Allocation of certain percentage of CSR budget for Pvt. Sector participation for RE Project - Policy and Regulatory <ul style="list-style-type: none"> • Definition of village electrification • Compliance of RPO target • Odisha RE Policy should be open for discussion and then legislated • Less investment on R&D - Strengthening Interdepartmental coordination - Community engagement <ul style="list-style-type: none"> • Awareness among people about making electricity is priority issue and also about policy and subsidy to access through RE energies technologies • Resource mapping for making right technology choice 	<ul style="list-style-type: none"> - Management Role <ul style="list-style-type: none"> • Flow of information from top to bottom • Pass the information to communities (simple understand friendly language) • Govt. depts. should understand - Affordability <ul style="list-style-type: none"> • Cost benefit analysis • Lowest level of acceptable (family as unit not village) • Inter departmental coordination

	<p>mechanism</p> <ul style="list-style-type: none"> - It is perceived the products used for RE are too costly - Many things are in the phase of demonstration 	<ul style="list-style-type: none"> • Operational issues 	
State and Non State Actor	<ul style="list-style-type: none"> - Department of Science and Technology - SC & ST development department(ITDA) - Rural development department(RWS S) - Forest and environment department - MMTC - OREDA - Power Ministry - MNRE - NREDA - Ministry of tribal affairs - Urban development department - Municipalities and corporations - Companies - PRIs - SHGs, CBOs 	<ul style="list-style-type: none"> - State actors - Ministries, Nodal agency, GEDCOL/OPTCL, OERC, etc - Non State actors - Discoms, Pvt. Companies on RE, Business and Industries, Research institutes/Universities, communities, civil societies, PRIs, SHGs 	<ul style="list-style-type: none"> • Independent Agencies, NABARD • Various line departments
Possible mechanisms of collaboration	<ul style="list-style-type: none"> - RE need of the community need to be included in the micro level plan of Panchayat - Adequate budgetary provisions for RE in relevant departments - Engaging youths and eco clubs to initiate a campaign on RE at the urban and rural level - Tribal schools need to be provided RE 	<ul style="list-style-type: none"> - Policy and budget analysis - Civil society group or multi-stakeholders platforms for advocacy - Energy Audits for public building 	<ul style="list-style-type: none"> - Watch dog- what, why and how - Assess the progress - Monitoring levels of governance

	equipments <ul style="list-style-type: none"> • Knowledge sharing platform and e forum can be initiated at the state and national level • Regular round table on RE • Taking these kind of discussion to the tribal districts and close to the users 		
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End Session: Possible areas of intervention in RE

The last session was devoted to discuss possible role of the civil society organisations to address the issues with regard to renewable energy. In this session Dr. Ambika Prasad Nanda, Sri Panchanan Kanungo and Ms. Vanita Suneja were the panel members.

- We have to create an environment of producing and also not wasting energy
- In India we have to concentrate on producing RE for livelihood purposes
- We need hybrid technology to use both conventional energy and RE
- Lack of information and access is a great impediment to RE use and growth
- Currently we would need 1.5 to 3 lacs to generate 1KW for domestic use
- Connection to the grid for getting credit for excess energy generated is necessary to encourage the consumer
- We should have kiosks where domestic RE appliances can be demonstrated by both manufacturers and satisfied end users
- Energy poverty is linked to wellbeing and education of people
- There is the issue of affordability and reliability. The RE sector is dominated by the private sector
- ***Pushing RE, which is costly, to rural areas while urban people get cheaper conventional energy needs to be reconsidered.***
- Capacity building at community level is necessary for sustainability
- ***Panchayat should lead both decentralized governance and decentralized energy***
- In Odisha MLA's are waking up to RE. Recently the CM and 256 MLA's attended a meeting on RE organized by the Climate Parliament
- In rural areas consider HH to be the unit and not villages as otherwise the real energy crisis in rural areas will not be truthfully depicted
- In Odisha a horticulture farm is generating 4MW. They want to give 3MW to the grid but do not know how. At Dandamukundapur in Odisha two enterprising youth have set up a gobar gas plant and are supplying needs of villagers on a cluster basis. Such producers should be encouraged with knowledge, cooperation and support
- In Odisha all industries have been instructed to produce 6.5% of their needs from RE but how many are doing that?
- If industry is sincere they can generate 40MW and sell 30MW

- We should have sector wise figures so that we can make adequate provisions as per capacity of the sector.
- Industry can grow based on their inherent strength. ***Individuals and rural communities adopting RE need subsidies.***

Commonly agreed points on how to take the issue forward

- Designing and disseminating community friendly information related to the use, cost-benefits, service providers etc. of renewable energy;
- Continued discussions on this issue should take place in a decentralized manner. These discussions should also involve community members who are using renewable energy for their daily living;
- Knowledge sharing platform needs to be created in the state which would capture the learning of RE users and promoters;
- Renewable Users and Promoters Community (ReUPC) need to be formed and should be active in policy inputs;
- An analysis of policies and schemes of RE should be conducted and disseminated for wider discourse among citizens;
- RE budget allocation and spending pattern in different five year plans need to be examined and civil society dialogue on how to enhance the budgetary allocation for the specific areas in the RE.

Media Highlights

- The OTV: <http://www.odishatv.in/talk-on-renewable-energy-resources-held/>
 - The Statesman: <http://www.thestatesman.com/news/odisha/renewable-energy-answer-to-power-crisis-in-state/62361.html>
 - The Pioneer: <http://mail.dailypioneer.com/state-editions/bhubaneswar/renewable-energy-generation-to-reach-17-by-17.html>
 - The Orissa Diary: <http://www.orissadiary.com/CurrentNews.asp?id=59136>
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