



Programme

SAARC Workshop on Household Energy Efficiency and Conservation with Women Participation

(10-12 September 2013, Dhaka, Bangladesh)

Monday, 9 September 2013	
Guests Arrive Dhaka, Bangladesh	
Tuesday, 10 September 2013	
Inaugural Session	
Chair: Additional Secretary, Power Division, Ministry of Power, Energy & Mineral Resources, Bangladesh	
Time	Description
0830 – 0900	Registration
0900 – 0910	Welcome Address by Deputy Director, SAARC Energy Centre
0910–0920	Inaugural Address by the Chair
0920 – 0950	Refreshments, Networking and Group Photo
Technical Session – I	
Chair: Professor M Rezwan Khan, VC, United International University, Dhaka	
0950–1110	Country presentations by the delegates of SAARC Member States • Afghanistan • Bangladesh • Bhutan • India • Pakistan • Sri Lanka
1110 – 1150	<i>Energy Efficiency in Building Sector with Women Participation</i> Dr. ZebunNasreen Ahmed Professor, Department of Architecture Bangladesh University of Engineering and Technology Dhaka, Bangladesh

1150–1200	Q & A
1200–1240	<i>Household Energy Options and Technology in the Context of Sustainable Energy for All</i> Ms. Anoja Wickramasinghe Professor of Geography Department of Geography University of Peradeniya Sri Lanka
1240 – 1250	Q & A
1250 – 1300	Closing Remarks by the Chair
1300 – 1400	Luncheon
Technical Session – II	
Chair: Mr. Siddique Zobair, Sr. Advisor, Power Division	
1400 – 1440	<i>Advocacy and Awareness Raising Measures (or Activities) to Promote Energy Conservation at Household</i> Ms. QuratulAin Team Leader Gender Strategy International Resources Group Islamabad, Pakistan
1440 – 1450	Q & A
1450 – 1530	<i>Women as Change Agents in Fostering Energy Efficiency: Case from Kerala, South India</i> Dr. R. Harikumar Head - Educating & Training Division Energy Management Centre Kerala, India
1530– 1540	Q & A
1540 – 1600	Refreshments/Networking
1600 – 1640	<i>Improved Cook Stove: A Pathway to Ensure Energy Efficiency and Women Health</i> Dr. Khalequzzaman, Senior Advisor GIZ Dhaka, Bangladesh
1640 – 1650	Q & A

1650– 1700	Closing Remarks by the Chair
1900– 2200	Welcome Dinner hosted by SEC
Wednesday, 11 September 2013	
Technical Session – III	
Chair: Dr. Saiful Haque, Professor, Institute of Renewable Energy, University of Dhaka	
0900 – 0940	<i>Women in Household Energy Management and in Energy Governance Systems</i> Ms. Anoja Wickramasinghe Professor of Geography University of Peradeniya Sri Lanka
0940 – 0950	Q & A
0950 – 1030	<i>Efficient Energy Management at the Household</i> Ms. Quratul Ain Team Leader Gender Strategy International Resources Group Islamabad, Pakistan
1030 – 1040	Q & A
1040 – 1050	Closing Remarks by the Chair
1050 – 1120	Tea and Networking Break
Technical Session – IV	
Chair: Engr. Anwar H Khan	
1120 – 1200	<i>Empowering Women Through Efficient Energy Interventions</i> Ms. Mamta Chandar Director, Jagriti Kullu 175126 (H.P) India
1200–1210	Q & A
1210–1250	<i>Role of Media on Domestic Energy Efficiency and Conservation - SAVE Program</i> Dr. R. Harikumar Head - Educating & Training Division Energy Management Centre Kerala, India
1250 –1300	Q & A
1300 – 1310	Closing Remarks by the Chair

1310–1410	Luncheon
	Chair: Deputy Director SEC
1410– 1510	Discussion on the Recommendations/suggestions/comments made by the Resource Persons and Delegates for the formulation of way forward
1510 – 1540	Networking Break
Valedictory Session	
1540 – 1550	Recommendations and Roadmap by Resource Fellow (TT)
1550–1600	Closing Remarks by Deputy Director SEC
1600 – 1620	Address by the Chief Guest and Distribution of Certificates
1620 – 1625	Vote of thanks (by one of the participants)
1625 – 1700	Refreshments/Networking
Thursday, 12 September 2013	
Field visit to Dhamrai, Savar, Dhaka to give on ground perspective to the workshop participants.	
0930	Departure from Hotel
1100 - 1300	Visit to Solar Home System and Biogas Program of IDCOL in the rural area where Women are benefited
1300 – 1400	Luncheon
1600	Arrival at Hotel

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



Islamic Republic State of Afghanistan

Presenter: Shahla Arifi
Position: Head of Social Affairs Department
Organization: Ministry of Women Affairs, Afghanistan

Contents of Presentation

Part 1

- * Afghanistan Energy Status

Part 2

- * Household Energy Efficiency and Conservation with Women Participation

Part 3

- * Challenges for Afghan Women

Part 1

Afghanistan's Energy Status

Energy Sector Status

- * More than 80% of Afghanistan population lives in rural areas.
- * Only few percentage (10%) of rural population have access to modern energy services, leading to limited agriculture productivity, water shortage, and depletion of natural resources and require enormous human efforts.
- * About 40% of the Afghan population in Urban /big cities have access to electricity.
- * Continuously rising energy demand, but power station mostly older than 40 years and need to be rehabilitated.
- * 85% from energy demand are covered by traditional biomass (for example Wood or Dung).

Long term development projects

- * CASA 1000: 1000 MW from the Northern neighbors to Pakistan through Afghanistan - 300 MW will be used in the country
- * Aynak copper mine: Chinese company (MCC) will exploit the coal mine in North Hindukush and build coal power plant - projected capacity is 400 MW
- * Shibirghan: 100 MW gas power plant supported by USAID.
- * Currently the major source of electricity in the country is imported from neighbouring countries i.e. 2250 GWh, amounting to 73% of our overall electrical energy demand.

Household Energy Efficiency and Conservation

Household Energy Efficiency

- * Energy efficiency in general refers to “using less energy to produce the same amount of goods or services”
- * EE programs in Afghanistan aim for an individual sector like industry, domestic, transportation or services because these differ significantly in their demand and therefore need different measures.
- * In Afghanistan households account for 70-75% of electricity consumption.
- * Experience in the country shows that the overall result of taking EE measures is mainly a reduced increase of electricity consumption.

Potential Measures to Reduce Electricity Consumption in Household

- * Replacement of incandescent bulbs by energy saving bulbs: savings of about 30 to 50 kWh per year.
- * Introduction of energy efficiency labels and reduction of import taxes on energy efficiency products: depending on the appliance, savings of 10–100 kWh per year.
- * Switch from electrical hot water preparation to solar water heating: savings of about 300–400 kWh per year and person.
- * Penetration of new electrical appliances, in houses to reduce the energy conservation effect of EE measures and increase of consumption.

Part 3

Challenges for Women in Afghanistan

Challenges for Women

- * In Afghanistan the poorest households are those headed by women.
- * Adult literacy rates remain low - 14% for women in Afghanistan.
- * Women, not been consulted on community issues and the situation for women's rights is particularly bad.
- * Life expectancy is 44 years for women in Afghanistan.

Effect of Electricity on Women

- * Electricity supply stimulates economic development, particularly through the use of electricity for production in mini and small businesses for women.
- * The stabilization of the power networks supports women.
- * Women as the main caretaker of the household and are even more severely affected by loss of access to electricity.
- * Household workload of women is alleviated and time is saved if electricity can be supplied.

Thanks



ENERGY EFFICIENCY AND ENERGY CONSERVATION FOR SUSTAINABILITY

SAARC Workshop on Household Energy Efficiency and Conservation with Participation of Women

10 September 2013

Dr. Saiful Huque and Dr. Nasif Shams
INSTITUTE OF RENEWABLE ENERGY
University of Dhaka

Contents

- Energy Efficiency and its Importance
- Energy generation and the government initiative
- Action Plans and ways to be energy efficient
- Regional progress and Business Prospects
- Women and sustainable energy
- Way forward for future actions



Energy Efficiency

Energy means ability to do work and Energy Efficiency is the measure of the useful energy produced compared to the total available energy.

Simply:

'Efficient use of energy' sometimes called 'Energy Efficiency'.

Goal:

The aim is to reduce the amount of energy required to provide output product and service.



Importance of energy efficiency

- A better use of resources equals **lower cost** for service.
- A balanced use of resources means a more **secure and reliable** energy supply.
- An expansion for products/services using less energy (using more wisely) is an injection for **future business**.
- A step change in improved energy efficiency is the only way to achieve wide-spread **welfare** without resource depletion.

Power Generation Scenario of Bangladesh

- Installed capacity of Power generation has been raised to 8425 MW.
- About 2300 MW came newly generated from imported liquid fuel based contingency plants.
- Higher costs of power was preferred over cost of no power.
- Bangladesh has successfully halted the downtrend of energy scenario, but needs to work for sustainable energy security.
- Access to Electricity 60%

Fuel Supply Scenario

- Slow progress in exploration and deployment of natural gas and coal necessitated urgent actions such as importing liquid fuel for power generation.
- Government imported and supplied liquid fuel for 2300MW power generation.
- Government subsidy Tk. 12,000 Crore annually.
- Delay of medium term power generation implementation has compelled government to continue with expensive imported liquid fuel.

Draft National Energy Policy 2008

The 5 (five) Fuel Strategy proposed to ensure Energy Security:

Priority 1: Natural Gas

Priority 2: Coal

Priority 3: Energy efficiency (EE)

Priority 4: Renewable Energy (RE)

Priority 5: Nuclear

SREDA

- A dedicated nodal agency, the **Sustainable and Renewable Energy Development Authority (SREDA)**, is envisioned in the Renewable Energy Policy to be set up soon to promote and develop renewable energy and energy efficiency activities in public and private sectors. SREDA has already been passed by the parliament.
- Until SREDA is in operation SREDA Cell has been set up at **Power Division** to carry forward the tasks envisioned for SREDA.

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PORTFOLIO OF SREDA

SREDA will act as a driving force to promote and disseminate sustainable energy technology by-

1. Adaptation of EE and Conservation Practices.
2. Steady penetration into renewable energy technologies as per energy vision of government. .

Government initiative for EE

In the study of Bangladesh Energy Efficiency Road Map (2009), 20 potential sectors have already been identified to achieve the energy efficiency improvement.



Government Initiatives

The government has taken a number of initiatives for efficient energy use and reduced consumption of energy:

- Initiatives have been taken in order to build awareness by incorporating EE in the academic curriculum.
- Initiatives have been taken to revise the 'Building Code'.
- Installation of PV panels
- Use of CFL bulb
- Replacement of street light by LED and solar-powered lights
- Public awareness for energy conservation
- The gradual discontinuation of incandescent bulb and electric heater
- Limiting the use of air conditioners or keeping temperature 25 degrees C.
- Closing of markets and shopping malls within 8 p.m.
- Discouraging the use of neon sign in markets at night
- Introduction of energy star rating system in the electric appliances through Bangladesh Standard Testing Institution (BSTI).

Government vision

Improvement of the primary and secondary energy saving level for sustainable energy security and low carbon emission.

The government has set the following targets to ensure sustainable energy security:

- 10% of primary and secondary energy saving by 2015
- 15% by the 2021 and
- 20% by 2030

ACTION PLANS REQUIRED FOR EFFICIENCY IMPROVEMENT

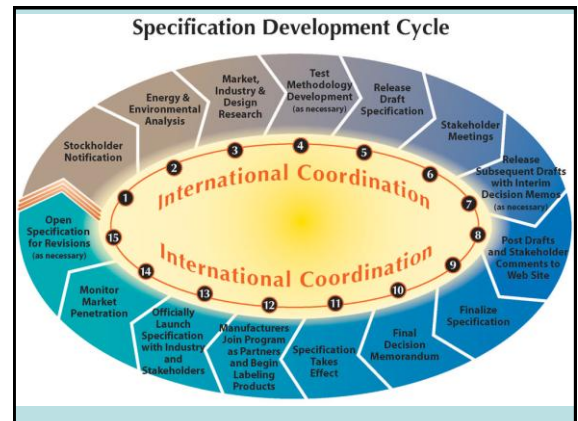
- National Policy mandate.
- Institution and Legal Framework.
- Appropriate Energy Pricing.
- Technology Intervention - Piloting / 'Show casing.'
- Capacity Building (Human & Equipment Cap.)
- Participation of the Private Sector
- Finance and incentives

Sector for EE Improvement

- Power Plant
- Power Transmission and distribution system
- Industries
- Transport system
- Agricultural sector
- Commercial building and Ports
- Demand side management

Guiding Principles for EE Specification Development (Energy Star leveling)

- Cost-effective efficiency
- Performance maintained or enhanced
- Significant energy savings potential
- Efficiency is achievable through several technology options
- Product differentiation and testing are feasible
- Labeling can be effective in the market



Target loads for Energy Efficiency

- Lighting
- Air conditioning
- Motors and drives
- Water Heating
- Drying in Industries

Target groups for EE

- Garment Industries
- Knitting Industries
- Fertilizer Industries
- Commercial establishment
- Shops and Markets
- Hospitals and Hotels
- Signboards and Billboards
- Building and Apartments
- Food Industries

Potential Energy savings

1000 Mega Watt-hour per day



Ways to be energy efficient

➤ Design building to save energy.

Using high tech
Low E window
glass



CONSTRUCTION OF CAVITY WALL



RECESSED WINDOW FILLED WITH TINTED GLASS



Energy savings

600 Mega Watt-hour per year for any large
commercial space cooling.



Case study LED Lighting in Action-Implemented

Section Seven Limited, Chittagong Export Processing
Zone, Chittagong

Energy Savings

Before LED

- Number of 40W tubes: 990
- Number of 20W tubes: 69
- Total electricity consumption: 41kW
- Annual electricity cost: Tk. 1,177,528



After LED

- Number of 18W tubes: 515
- Number of 9W tubes: 58
- Total electricity consumption: 10kW
- Annual electricity cost: Tk. 287,202



Improved rice parboiling system



Improved cook stove 3-pot Bondhu Chula



Hoffmann Kiln for Brick Production "Ring Oven"



A common barrier of EE

"We just don't have the money to improve energy efficiency".

Business prospects of EE

- An attractive and growing market for energy technology.
- By year 2020 EE would gain 12% to 30%
- Power saving would be 119 Twh-297 Twh
- Equivalent saving amount US \$ 156 - 436

Progress of EE in the Regional Countries

- Energy efficiency standards and plans are insufficient.
- Energy efficiency is still not seen as a top business priority by many companies

Ways to improvement

- Increase awareness of EE and enhance professionalism of the company within.
- Develop innovative financing vehicle for EE payments, move toward an integrated value chain approach

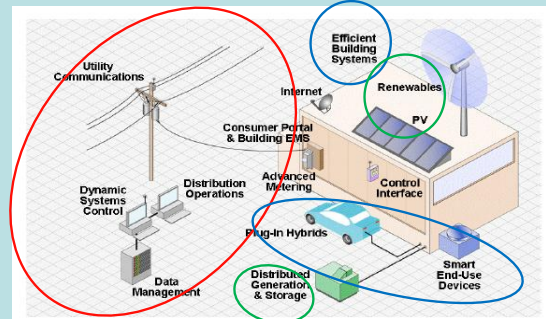
Gender equality for Access to Energy

- Unequal gender relation restricts women to limited access to energy.
- Women in developing countries are affected by energy scarcity more than men.
- Women and girls spent most of their time for basic subsistence work.
- Due to women empowerment female leaders are now playing leading roles for the promotion of clean energy and reduction of pollution.
- Improved Green Job availability for Women

Global Practices and Future Business The two extremes-

- **Technology driven** (Adapt and combine technologies). Stakeholders are already identified actors who enters when the incentives are right
- **Service driven** (Adapt business structure). Some stakeholders are new emerging and integrated to deliver services in accordance with needs and regulations)

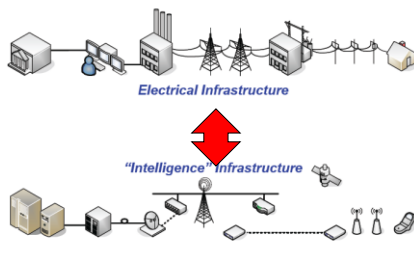
New Technologies and Regional Cooperation



Source: An EPRI Initiative to Advance the Efficient and Effective Use of Energy

The smart grid – A happy marriage ?

Achieving the Power Delivery System of the Future: Integrating Two Infrastructures



Roadmap to Energy Efficiency based Economy

Energy Efficiency in Bangladesh could be implemented successfully when there will be a united effort from people, the Government, development partners, Academics, Private Enterprises and all other Development Agencies.

- Please do not waste water
- Please switch off power when appliances are not in use
- Please Reuse

Thank You

Contact
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Household Energy Efficiency and Conservation with Women Participation Dhaka, Bangladesh 10-12 September 2013

TANDIN WANGMO
ENVIRONMENT OFFICER
DEPARTMENT OF RENEWABLE ENERGY,
MINISTRY OF ECONOMIC AFFAIRS, BHUTAN

Country Information : BHUTAN




- Capital : Thimphu
- Area : 38,394 km²
- Population : 742, 737
- Population Density : 18.0/km²
- GDP : Approx. \$1.488 billion
- Currency : Bhutanese Ngultrum (BTN)
- Present Government: People's Democratic Party

Department of Renewable Energy (DRE)

Vision:
Provision of diverse forms of green and renewable energy solutions and energy efficiency options aimed at enhancing energy security and sustainable development of the country.

Mission:
To promote all forms of available and viable renewable energy resources and technologies from supply side of energy chain through applied research, development, capacity building, demonstration projects, and devising appropriate incentive schemes while actively embracing energy conservation and efficiency measures from demand side of energy chain.

Department of Renewable Energy (DRE)_{contd}

Functions of the DRE:

- Amongst others, function as Apex body for Renewable Energy Policy formulation, planning, designing and implementation at the national level.
- Coordination with other Ministries, Departments, SAARC/BIMSTEC/ACD/SARIE, Donors/Lenders, Public and Private Sectors, other related agencies/bodies on various issues related to RE systems

Energy Efficiency Programme (Implemented)

The following programmes were carried out as part of EE measures:

- Integrated Energy Management Master Plan – 2005
- Bhutan Energy Data Directory – 2005
- Energy efficiency awareness program (broadcasting through local media/pamphlets, replacement of inefficient stoves with electric cookers) – 2008-09
- CFL programs in the areas covered by micro hydropower plants – 2002
- Rural clay stoves to meet the heating and cooking requirement - 2005

Energy Efficiency Programme (initiated & ongoing)

Energy Efficiency Baseline Study for Bhutan carried out in 2012 under UNDP funding.

- The objective of the study was to establish baseline information that identifies and quantifies energy efficiency in the residential, commercial buildings, transport, industry and agriculture sector and make recommendations as input for the policy formulation on EE.
- The study recommended that there is a huge potential for EE in the above sectors

Other Related Programmes & Policies at the National Level

1. Development of Energy and Standard Codes for Building for Bhutan under UNDP funding
 - The objective is to set energy codes and standards for buildings and energy intensive sectors keeping in mind the structural and architectural designs.
 - Consultancy Agreement signed for the development of “Energy and Standard Codes for Building in Bhutan”
2. Bhutan Green Building Guidelines – DOES, MOWHS
 - The objective is to enhance the positive impact of the built environment on the natural environment and to boost public health and general wellbeing.

Other Related Programmes & Policies at the National Level_{contd}

3. Sustainable Rural Biomass Project under UNDP/GEF/BTFEC under implementation;
4. Formulation of Energy Efficiency Policy
5. Demand Side Management for Enhancing Energy Security by using CFL
6. Assessment of Bio-fuel resources to explore for fossil fuel substitution
7. Development of appropriate standards and labeling for import of energy consuming products

Women in the Bhutanese Household

- The average Bhutanese household is run by the women on a day to day basis
- Most decisions regarding the running of the household are taken by the women
- The day to day chores are also mainly dealt with by the women

Women and Energy Efficiency

- According to the Baseline study, domestic households are the highest consumers of electricity in Bhutan

Sl no.	Region	Domestic	Commercial	Institutional
1	Chhukha	16.3 GWh	5.9 GWh	8.4 GWh
2	Thimphu	64.4 GWh	19.0 GWh	17.6 GWh
3	Paro	11.6 GWh	8.4 GWh	3.4 GWh

Women and Energy Efficiency_{contd}

- Domestic households in Thimphu alone consume more than 40% of the electricity consumption in buildings sector.
- The Baseline Study recognizes the need for extensive awareness creation, advanced capacity building program and incentive schemes to improve the current trend of electricity consumption at the domestic household levels.

**“You educate a man; you educate a man. You educate a woman; you educate a generation.”
– Brigham Young**

Women and Energy Efficiency contd

- Although cost is a major factor while buying household appliances, an educated and aware woman will weigh out the possible benefits and negative impacts of buying any appliances. Therefore women, as prominent figures in a household, play an important role in promoting energy efficiency and creating awareness amongst themselves and among the members of the families.

THANK YOU

Gender and Energy Issues in India

India: Gender and Energy Issues

Household energy consumption pattern –Rural India

- 95.6% of households use biofuels
- 16.5% use kerosene for cooking
- 5.4% use LPG for cooking
- 0.3% use Biogas for cooking
- 63% households are electrified

Most households use multiple fuels

625 million people in India do not have access to modern cooking fuels
Nearly 300 million people do not have access to electricity

Traditional biomass accounts for 28% of India's primary energy consumption, compared to the 2% from modern renewable energy technologies

India: Gender and energy issues

Women are particularly impacted by energy poverty

- Women have to walk on an average 30 kms in a month for collection of fuel wood
- About 2.7 hours spent per person per trip and 40 hours spent per month per household
- Women chief cooks primarily affected by exposure to high levels of indoor air pollution.
- Children enlisted to help mothers with fuelwood collection

Missed opportunities for self improvement....

Mismatch between prevalent energy use pattern and energy policy focus

Women manage 1/3rd of the energy system of India by gathering fuels. Where is the Management and technology support?

Larger Societal Issues: Gender and Energy

- Gender inequity & traditional labour divisions
- Women's control over energy related decisions: new appliances...., land use.... and what trees and crops are grown, how she uses her time....., her mobility
- Energy in other sectors (agriculture: 47% of agricultural workers are women) (cottage industries: consuming 23.5 Mton non-commercial fuels in 2003-04)
- Less access to education, training, information, credit

Lessons from experiences

Gender sensitive energy projects are all about **processes**.

Must address **women's basic energy needs** for labour and time-saving, improved health and income

Offer a **bundle of services** to (a) enable women to access improved energy, (b) enhance their entrepreneurial and technical skills, and self-confidence.

Specific **gender strategy** in energy projects: mainstream gender concerns throughout the project cycle

Emerging Priorities

Gender and energy > cooking energy
Energy services women need the most

- Cleaner, more convenient fuels
- Agricultural processing
- Water pumps
- Electricity for information and communication technologies
- Lighting for improving security, community and school activities at night
- Lighting for making women's domestic work easier
- Lighting for improving the productivity of women's income-earning work
- Refrigeration and other labour saving appliances

Women have a key role to play in addressing this challenge (users/ managers of domestic energy)

New forms of collectives offer new possibilities (self help groups/ women's communes)

GOOD PRACTICES

Women have a track record of functioning as effective entrepreneurs in successful organizations and networks (like Grameen, SEWA, etc.).

- Frequent and flexible repayment schedules
- Alternative collateral requirements
- Informal banking atmosphere
- Simple loan application procedures
- Information channels accessible to women

Improved cooking devices a virtually untapped market

Build a critical mass of women in energy sector

Energy Saved Is Energy Produced ! - Less Energy Consumed Is More Energy Conserved

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HOUSEHOLD ENERGY EFFICIENCY AND CONSERVATION WITH WOMEN PARTICIPATION _ AN OVERVIEW OF PAKISTAN SITUATION BY HUMA CHUGHTAI

A Workshop by SAARC Energy Centre
10 – 12 September, 2013
Ruposhi Bangla Hotel, Dhaka

Pakistan Energy Facts

- Energy demand in Pakistan has grown six fold since 1980 and is estimated to double further by 2015;
- Rapid population growth with low median age and low per capita energy consumption coupled with increased energy demand and inaccessibility of efficient energy home appliances has worsened the situation;
- Energy demand for domestic consumption is five times higher than the commercial demand;
- Varied energy sources are used to cater for the energy needs including natural gas, electricity, coal and biomass-fuels like wood and dung etc.
- GOP's IEDP (PRSP II) states *"Ensuring energy security and efficiency will be amongst the government's top priorities in order to tackle the current energy crisis and enable sufficient supply of energy for domestic as well as commercial use."*

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Outline of the Presentation

- ▣ Pakistan Energy Facts
- ▣ Energy, Poverty and Gender Nexus
- ▣ Alternative Energy Sources in Pakistan
- ▣ Energy Saving Technologies in Pakistan
- ▣ Issues within Energy Sector in Pakistan
- ▣ Recommendations

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Energy, Poverty And Gender Nexus (Contd)

- ❖ Women and men have different degrees of access and control
- ❖ Energy scarcity has a disproportionate effect on women and girls.
- ❖ Women and men have different perceptions about the benefits of energy
- ❖ Women and energy are inseparably linked i.e. at basic household level, women are the collectors, managers and consumers of energy sources including collection of fuel-wood biomass on the one hand and consuming electricity, kerosene oil, and natural gas on the other hand for operating cooking stoves, water and room heating etc.
- ❖ Consequently, women remain directly exposed and vulnerable to health and environmental hazards on the one hand and on the other, opportunities for their education and income generation are restricted/blocked
- ❖ **Energia Pakistan has been institutionalized in AEDB to influence policy making**

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Energy, Poverty And Gender Nexus

Poverty is generally viewed in strict economic terms, and people with less than a \$ 1 a day income are considered as poor

Energy Poverty: Energy remains the main source for basic needs like cooked food, boiled water, warmth and mobility; Access and affordability of energy is, therefore, equally essential as it is a critical means to secure the basic needs;

Of the 1.3 billion people who live in poverty - 70% are women

One-third of households in rural areas have female heads

Women are the primary collectors, users and managers of energy for homes

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Alternative Energy Sources in Pakistan (Contd.)

▣ **Biomass**

- ✓ Bio-fuels account for 86% of total household energy consumption and fire wood alone account for 54% of the total
- ✓ While urban households use 70% of the modern fuel in residential sector, the rural households use more than 90% of their energy consumption based on traditional fuels. It is estimated that an average biofuel-using household consumes 2325 kg of fire-wood or 1480kg of dung 1160kg of crop residue per annum
- ✓ Pakistan remains under increased threat of deforestation primarily due to shortage of timber stock

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Alternative Energy Sources in Pakistan

▣ **Solar Energy**

- ✓ Most abundant and clean source of energy with wide range of application
- ✓ Being rapidly explored and exploited in Pakistan
- ✓ Increased household consumption is being experimented
- ✓ Installation and equipment considered expensive

▣ **Wind**

- ✓ Wind turbines for power generation are still being experimented, especially in different parts of Sindh and Balochistan provinces;
- ✓ not being considered for domestic/ household use so far
- ✓ Considered expensive in terms of maintenance and installation

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Energy Saving Technologies in Pakistan

▣ **Biogas**

Development and Promotion of Biogas Technology for meeting domestic fuel needs of rural area and production of Bio-fertilizer by PCRET

- ✓ 1974, GoP initiated a comprehensive biogas scheme
- ✓ By 1990, 4550 biogas units installed across the country
- ✓ Objective: to provide 3000 and 5000 cubic feet of biogas per day for cooking and lighting purposes;
- ✓ The program was developed in three phases:

Phase 1: 100 demonstration units were installed by government grants

Phase 2: Cost of biogas was shared between beneficiaries and government

Phase 3: Government withdrew the financial support but technical support continued free of cost.

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Alternative Energy Sources in Pakistan (Contd.)

Micro-hydro Projects

- ✓ These plants provide electricity for lighting at night and are also used for running small flourmills for wheat and maize thrashing and cotton ginning during the day time
- ✓ Provision of Electricity to Earthquake Effected Areas Through Installation of 100 Micro Hydro Power Plants by PCRET

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Energy Saving Technologies (Contd.)

▣ **Biogas Cooking Stoves**

were later developed and introduced by PCRET. The stoves are of two capacities (3 & 5 cubic meter gas production). The fuel is taken from 5-6 cattle for one household

▣ **Efficient Cooking and Space Heating Stoves**

Efficient cooking, space and water heating stoves were developed by PCRET's "Fuel Saving Technology Project (FSTP)."

Two kinds of stoves were designed and developed with different capacities and costs:

- ✓ A single stove used for cooking and space heating; saves on more than 40% fuel; It is smokeless, therefore it neither spoils the cooking utensils nor does it spread any kind of indoor or out door pollution.

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- ✓ The second model in addition to having exactly the same specifications as Model -I, has the functions to heat water. Its best use is in winters.
- ✓ Life of these stoves is: inside two years and outside 5-6 years.

Issues:

Well intended innovations but developed with exclusion of consultation with women in the fabrication and making of these technologies; thus, the element of integrating their needs and concerns for improved and gender responsive technologies is missing;

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Issues within Energy Sector in Pakistan

- ✓ Energy sector is considered as gender neutral and a male domain
- ✓ Gender mainstreaming efforts remain a challenge as energy policies and laws are gender insensitive
- ✓ Women's entrepreneurship, their role at the policy and decision making level, and skill-building is almost non-existent
- ✓ Aid effectiveness through implementation of Paris Principles is weak
- ✓ Lack of coordination within Gender and Energy efforts
- ✓ Knowledge awareness on Energy Conservation for women is very poor and limited
- ✓ The draft Energy Conservation Bill is gender blind

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Issues within Energy Sector in Pakistan

- Existing energy infrastructure needs intensive revamping as:
 - ✓ Transmission and distribution is inefficient
 - ✓ Major water reservoirs are losing capacity
 - ✓ Climate change is impacting access to resources
 - ✓ Promotion of renewable energy options is still inadequate both in terms of knowledge and awareness as well as at affordability and accessibility level
 - ✓ Weak institutional coordination amongst public sector renewable energy organisations e.g. AEDB, PCRET, & ENERCON etc

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Key Recommendations

- ▣ Need for Greater cooperation and coordination amongst the players – both at the private as well as at the public level for information and data sharing
- ▣ Energy policies and plans need to be gender responsive with greater attention on women's awareness raising and participation in the processes
- ▣ Women need to be encouraged in not only at conservation levels but also facilitated and promoted at the entrepreneurship and policy decision making levels
- ▣ Paris principles need to be followed by donor community and support partners

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Key Issues

1. Absence of gender disaggregated data
2. Lack of awareness & understanding of gender, energy and development nexus
3. Social biases and gender inequality exist
4. Under-representation/absence of women in energy interventions and decision-making
5. Women's lack of knowledge on the use and conservation of renewable energy
6. Rise in energy prices leading to increased unaffordability
7. Linkages between individuals and organizations involved in gender and energy are almost non-existent
8. Lack of relevant case studies that could identify directions for policy and decision-making in this area

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Key Recommendations - III

- ✓ Mass advocacy & awareness campaign needs to be launched with cooperation of the civil society and the media; School curriculum and the media must highlight women's current & potential role in energy sector and joint social responsibility of energy conservation;
- ✓ Dedicated scholarships for women to motivate them towards entering the energy sector through education need to be announced;
- ✓ Establishing and strengthening linkages between individuals and organizations involved in gender and energy need to be promoted by reflecting this in the policy;
- ✓ Special budgetary allocations [atleast 10%] in the annual sectoral budget need to be dedicated to promote and address specific women's needs and concerns, including undertaking Research and Development in this regard

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Key Recommendations - II

- ✓ REE technologies must be developed with inclusion of women's perspectives and their needs and concerns through consultative process and undertaking need assessments
- ✓ SAARC needs to assume an institutional approach in integrating gender mainstreaming in all its efforts – especially the SAARC Energy Centre should make gender as its integral part
- ✓ SAARC must create a special position of Gender Advisor/ Coordinator to consult, coordinate and work with counterparts/ focal points in the regional countries to make its work more meaningful and inclusive
- ✓ SAARC Energy Centre must support and encourage periodic experience and best practices sharing opportunities for women working on gender and energy within SAARC

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Thank You

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PARTICIPATION OF WOMEN IN HOUSEHOLD ENERGY EFFICIENCY AND CONSERVATION



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Ministry of Power & Energy
Sri Lanka
10.09.2013

Presentation overview

- About Sri Lanka
- Why Do We need Energy Efficiency & Conservation
- Home Energy Use
- Tips for Energy Efficiency & Conservation



Location & Geography

- On the Southern Tip of India Separated by the Palk Straits
- A total of 65,610 Sq Km
- Climate - Tropical



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3

Country Profile

- **Capital** - Colombo
- **Administrative Centre** - Sri Jayawardenapura, Kotte
- **People** - **Nationality** - Sri Lankan
- **Population** - 19.8 Million
- **Annual Growth** - 1.1%
- **Ethnic Groups**
 - Sinhalese 74%
 - Tamils 18%
 - Muslims 7%
 - Others 1%
- **Religious** - Buddhism, Hindu, Islam, Christian
- **Language** - Sinhala & Tamil (Official), English
- **Education** - Compulsory to Age 14
- **Literacy** - 91%

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4

Economy

- o **G D P** - US\$ 59.42 Billion
 - o **Annual Growth Rate** 6.3%
 - o **National Resources** - Limestone, Graphite, Mineral Sands, Gems & Phosphate
 - o **Components of GDP**
 - Agriculture - 31.8%
 - Services - 42.4%
 - Industries - 25.8%
 - o **Trade** - Exports - US\$ 10.51 b
- Exports - commodities
textiles and apparel, tea and spices;
rubber manufactures; precious stones;
coconut products, fish

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5

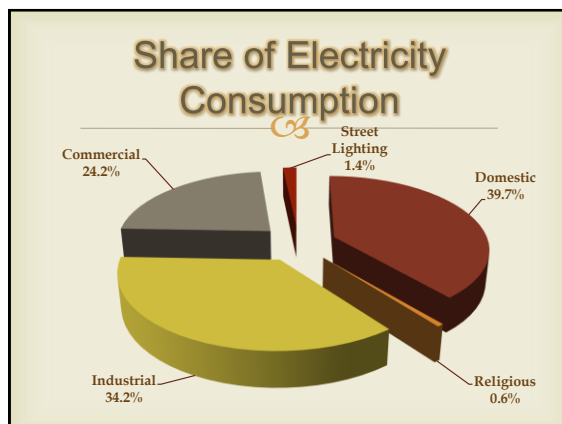
Why do we need Energy Efficiency and Conservation

Key Issues

- Rising Energy prices
- Global Climate Change
- Security of Energy Supply
- Economic growth

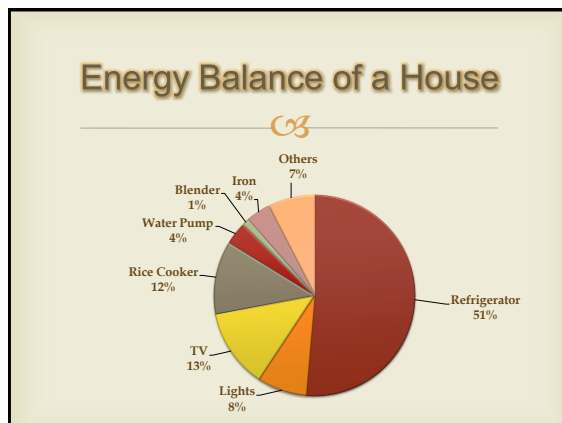
The inefficiency of the systems contribute greatly to the overall energy consumption

Home Energy Use



Activities in Women involvement on Energy Consumption

- ☞ Cooling
- ☞ Refrigeration
- ☞ Cooking
- ☞ Lighting
- ☞ Ironing
- ☞ Washing and Drying
- ☞ Television
- ☞ Other appliances in the Kitchen



Contribution of Different Appliances to the Monthly Electricity Bill

Equipment	kWh/ month	Percentage (%)
Refrigerator	30	29
Lighting	15	15
Television	12	11
Other Electrical Appliances	25	25
Washing Machine	20	20
Total	102	100

Energy Saving Tips for women

Lighting

Lighting

Energy Efficiency

Using "efficient" equipments - kWh

100 W



20 W



15 W



Compact fluorescent bulbs use 1/4th the energy of incandescent bulbs, last 10 times longer, and are more cost effective.

1 Compact fluorescent bulb = 10 Standard Incandescent Bulbs



Lighting



One of the best energy-saving devices is the light switch. Turn off lights when not required

Lighting



Utilize task lighting with high efficient, low glare lamps and fixtures

Lighting



Utilize skylights as much as possible in day time



Lighting



Many automatic devices can help in saving energy used in lighting. Consider employing infrared sensors, motion sensors, automatic timers and dimmers wherever applicable, to switch on/off lighting circuits

Lighting



Use Electronic ballasts as much as possible

Magnetic Ballast to Electronic Ballast

- Improve ballast factor
- Consume Less energy

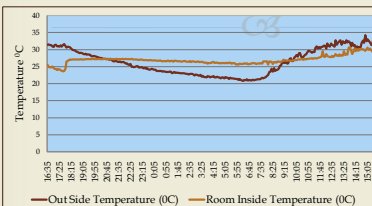
Lighting



The Gazette of the Democratic Socialist Republic of Sri Lanka
No. 1611/10 - Wednesday July 22, 2009

Air Conditioning

Air Conditioning



Ambient temperature is lower than the room temperature in every morning.

So purge fresh air for about 1 to 1.5 hours before start the "Air Conditioners".

As the heat releasing rate of building materials is lower than the outside ambient air, the temperature of inside room will be higher than the outside in the morning.

- Seal cracked or broken windows of air conditioned spaces.
- Seal electrical outlets and switches on walls.
- Keep window and doors closed when cooling system is on.
- Caulk and seal air leaks where plumbing, ducting, or electrical wiring penetrates walls, floors and ceilings.
- Use nature's energy.



bilts.

Landscaping is a natural and beautiful way to help keep your home more comfortable and reduce your energy



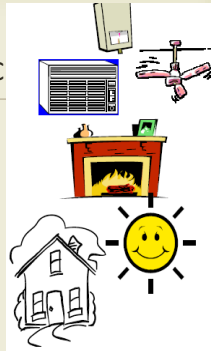
Air Conditioning

• Set the thermostat for 26°C for savings

• Install a programmable thermostat

• Keep your air conditioning filters clean

• Clean ductwork and vents



Air Conditioning



It can be reduced air-conditioning energy use by as much as 40 percent by shading your windows and walls. Plant trees and shrubs to keep the day's hottest sun off your house.

Use of Refrigerator

Use of Refrigerator



Make sure that refrigerator is kept away from all sources of heat, including direct sunlight, radiators and appliances such as oven, and cooking utensils

Use of Refrigerator



Refrigerator motors and compressors generate heat, so allow enough space for continuous airflow around refrigerator. If the heat can't escape, the refrigerator's cooling system will work harder and use more energy

Keep the coils clean. This helps the refrigerator/freezer cool easier; dust buildup makes it work harder, using more energy each time the motor turns on.

Use of Refrigerator



• Store things in order to make it easy to pick them as you need. Thereby it can be reduced the door open time

• Put food in containers with lids. Uncovered foods, especially liquids, release moisture and make the compressor work harder. Let food cool to room temperature before placing it in the refrigerator/freezer.

Use of Refrigerator



Think about what you need before opening refrigerator door. You'll reduce the amount of time the door remains open

Use of Refrigerator



Keep deepfreeze material in the normal freezer for 10 to 12 hrs before use it.

Set the temperature of the refrigerator at 2 to 4 degrees C. and the freezer to -10 to -15 degrees C.

Don't keep the refrigerator or freezer too cold. You can check the temperature with a thermometer.

Use of Refrigerator



Make sure the refrigerator door sealed properly. If the door isn't tight warm air will seep into the refrigerator/freezer, making it work more and use more energy.

To test tightness, close the door on a piece of paper, half in and half out of the refrigerator. If you can pull the paper out easily, the seals may need to be replaced or the door latch adjusted

Energy Saving Tips - TV



❑ Switch off the unnecessary lamps while watching TVs



Energy Saving Tips - Ironing

❑ Iron all lot once. Start from the rough cloths and iron the lighter materials last by reducing the iron temperature



Energy Saving Tips - Ironing



❑ Keep aluminum foil on the iron board so that temperature get reflected and both side of the material get iron once.



While Using Fans

- ❑ Utilize natural ventilation as much as possible



While Using Fans

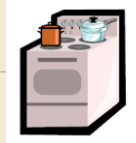


- ❑ Utilize pedestal fans instead of ceiling fans as much as possible



Cooking Tips

- Don't use the stove as a heating device
- Keep lid on pots and pans while cooking
- Use proper size pan on stove top burner
- Cook as many things as possible at same time
- Keep oven door closed while Cooking
- Don't over cook food
- Microwave foods when possible



Way Forward

- ☞ Energy Education
- ☞ Training
- ☞ Information and Technology
- ☞ Decision-making
- ☞ Access to resources

Role of Professional Women in the Energy Sector



- ☞ Women are increasingly engaged in energy professions,
 - ☞ increased access to science and technology education
 - ☞ equal opportunity policies by institutions and government

Knowledge & Expertise - be used in promoting energy conservation

- ☞ Increased recognition for women in the society

Promoting Women Participation in Energy Conservation

- ☞ Organizing special campaigns to increase female participation in energy conservation.
- ☞ Convening women's groups to campaign for Energy Conservation in their respective areas.
- ☞ Promoting access to Energy Education.
- ☞ Increasing awareness among women in order to conserve energy in a domestic level

suggestions

- ☞ A network involving women in various cross sections should be established to facilitate access to Energy Information & Education in Science, Technology & Economics
 - ☞ Professional women
 - ☞ Women in Engineering
 - ☞ Opportunities for women
 - ☞ Women in other working classes
 - ☞ Housewives
 - ☞ NGO's
 - ☞ Civil Societies

Regional Context

- ☞ A regional coordination among women in Energy Conservation
- ☞ Establishing Womens' Forums in a Regional Basis
- ☞ Taking Role Models from Countries in which women are playing a considerable role in Energy Efficiency and Conservation



Be Energy Smart
Be Comfortable
Be Healthy
Be Safe

SAARC Workshop Household Energy Efficiency and Conservation

Energy Efficiency in Building Sector with Women Participation

Dr. Zebun Nasreen Ahmed

Professor, Department of Architecture
Bangladesh University of Engineering and Technology
(BUET), Dhaka, Bangladesh

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1

An Energy Efficient future

- Men and Women both have roles to play in building an energy efficient future.
- Great technology needs pairing with policy
- SAARC region – much of the area – outside national grid – efficiency in energy consumption is vital
- Decentralized power systems may overtake traditional grids – especially in inaccessible areas.
- Women form 50% of population – but use the lion's share of domestic energy

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Residential energy usage

- Different for urban and rural situations
- In urban areas:
 - HVAC
 - Intensive domestic appliances (fridges, irons, water heaters, etc)
 - Non-intensive appliances (TV, fans, computers, etc)
 - Lighting
 - Cooking

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Residential energy usage . . .

- In rural areas:
 - HVAC
 - Intensive domestic appliances (fridges, irons, water heaters, etc)
 - Non-intensive appliances (TV, fans, computers, etc)
 - Lighting
 - **Cooking**

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Other buildings – energy usage

- In both urban and rural areas:
 - HVAC
 - Lighting
 - Intensive appliances (fridges, water heaters, etc)
 - Non-intensive appliances (TV, fans, computers, cellphones, etc)
- Women form 50% of population – but only a small portion use public buildings in the SAARC region – being mainly home bound – but this is rising in factories

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Contexts

- Energy needs also vary from region to region.
- In the industrialized north, domestic energy uses include space heating, washing and drying of clothes and dishes, vacuuming, many mechanized kitchen appliances, etc, which are often performed manually or using natural means in the SAARC region.

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Participation of Women??

- ❑ Undoubtedly extremely important for a sustainable future!!
- ❑ Women most affected by lack of electricity, being required to substitute physical labour to accomplish their household tasks*
- ❑ The fuel energy used for cooking has a major impact on the environment
- ❑ Energy habits of the mother are transmitted to children – their awareness can expedite an energy efficient future.

*IAE, 2011; Branco, 2002

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Cooking energy

- ❑ Firewood – common form of energy for cooking
- ❑ Sustainability, gender and health implications
- ❑ Smoke and particulates – higher incidence of lung and eye diseases among women
- ❑ Gathering firewood, affects health and keeps girls away from school – affecting education and income*.
- ❑ Directly responsible for loss of forests and biodiversity

* Energy Poverty, 2010; Energia 2010; Branco, 2002

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Gender perspectives*

- ❑ Men view benefits of electricity – leisure, quality of life and education for children
- ❑ Women view benefits of electricity – way to reduce workload, improve health and reduce expenditure
- ❑ Women are generally responsible for household energy provision and use
- ❑ Men generally make decisions about purchased energy sources (batteries, radios, TVs, etc. rather than for labour-saving appliances)

*Clancy et al. 2003; and McDade and Clancy. 2003.

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Renewable Energy Technologies

- ❑ RETs are expensive
- ❑ But they improve the quality of life of women
- ❑ Empower women - household chores become less labour-intensive, giving time better spent on family life or income-generating activities
- ❑ Optimum mixture of renewable and non-renewable energy resources
- ❑ Better lighting for security around the house, ease of doing household work at night, more leisure, income generation opportunities, better education, time management

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Women's contribution for EE?

- ❑ Optimizing natural sources – passive/green architecture
- ❑ Efficient energy management at the household and community levels – capacity building
- ❑ Best practices in energy efficiency and conservation – using household appliances to reduce energy waste
- ❑ Renewable energy applications (solar cookers, solar lighting, solar dryers, solar water heaters etc.)
- ❑ Income generating activities in EE
- ❑ Role as agents of change – awareness

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Green Architecture – a process

- ❑ A completely new approach to design – considers interconnectedness of things – not limited to energy efficiency
- ❑ Architecture becomes part of the wider ecological framework – resource efficiency and sustainability considered at every stage
- ❑ Green considerations begin at the very inception of the design, and include the entire life cycle of its existence
- ❑ Broader considerations of economic and social issues – women are equal partners

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Passive/Green Architecture

Energy budgeting

- ❑ Energy implications of a building during its **life cycle** – **building form, layout, material**
- ❑ Design – construction – occupation – dismantling – **Cradle to Cradle***
- ❑ Energy expended in manufacture of materials
- ❑ Energy expended in transportation to site
- ❑ Environmental/energy implications of ultimate disposal

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* McDonough & Braumgart, 2002, North Point Press

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Passive/Green Architecture . . .

Passive design – form, layout, materials, etc

- ❑ Where active energy needs are minimum
- ❑ Where positive effects of **wind, sun, light**, etc are included
- ❑ Where negative effects of **overheating, glare, rain, dust**, etc are excluded
- ❑ Where the building, by its presence, does not adversely affect the environment

Main aim – creating comfort without compromising quality, while reducing consumption

Energy strategies

- ❑ **Contextualize** standards – warmer conditions, higher temperature and lower light levels, etc may be suitable for tropical populations because of body adjustment – substantial energy savings
- ❑ Through **design** – reduce needs for energy use
- ❑ Where possible use energy efficient sources to satisfy needs – identify inefficiency in the building – **separate metering**
- ❑ Renewable energy use – **alternatives** to conventional energy sources

Efficient Light Sources

- ❑ Maximize Daylight without heat
- ❑ Compact Fluorescent Lights – CFLs – 4 to 5 times more energy efficient than Tungsten lights – more durable, comes with guarantees – health hazards?
- ❑ Light Emitting Diodes – LEDs – about 4 times more efficient than CFLs – expensive, light distribution limited to narrow focus – but very durable
- ❑ **Light and movement sensors** – to combat the culture of energy waste

Light Emitting Diodes – LEDs

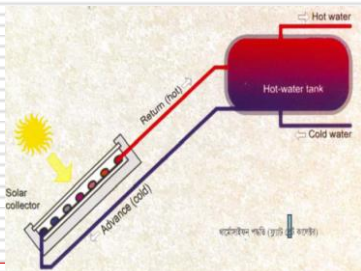
- ❑ Safe, long-lasting and very energy efficient – 50 to 100 times longer than incandescent bulbs



Energy efficient Water management

- ❑ Rain water management – collection at levels so that gravity flows can be used instead of pumping
- ❑ Half flushes – approx 1/4th of consumption
- ❑ Movement sensors
- ❑ Solar water heaters with kitchens and toilets – for preheated water

Solar water heater



Preheated water to save heating energy requirements

Green roofs for water management

- ❑ Storm water management – reduces runoffs
- ❑ Keeps roof temperatures down – important for tropical areas
- ❑ Promotes healthy environments by controlling buildup of CO₂.
- ❑ Provides community space in dense urban situations – **safe spaces for women**

Green roof . . .

<http://static.ddmcdn.com/gif/green-roof-save-money1.jpg>



www.toronto.ca/greenroofs/what

Alternative sources of energy

- ❑ Photovoltaics though expensive are appropriate because of high solar input in Bangladesh – 3-5% suggested in BNBC revision – surfaces needed
- ❑ Concept of using BIPV rather than stand alone systems – but with dense construction this may be difficult

Policy – Training – Finance

- ❑ Policy – Bangladesh is in the process of changing legislation to include these processes
- ❑ Training is essential to make it a success – men and women
- ❑ Finance – to make these features attractive

Implementation can only be possible if these are in place

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Thank you

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HOUSEHOLD ENERGY OPTIONS AND TECHNOLOGY IN THE CONTEXT OF SUSTAINABLE ENERGY FOR ALL

Prof. Anoja Wickramasinghe
Emeritus Professor of Geography
University of Peradeniya
Sri Lanka
Coordinator:

National Network on Gender, Energy and Environment

SAARC Workshop on: Household Energy Efficiency & Conservation with women Participation, 10-12th Sept, Dhaka, Bangladesh

HOUSEHOLD ENERGY OPTIONS AND TECHNOLOGY IN THE CONTEXT OF SUSTAINABLE ENERGY FOR ALL

Questions in hand

1. Why should energy options and technologies be treated essential for women to play their roles in enhancing energy efficiency and conservation?
2. What options do women have and what are the implications of their informal practices
3. What areas need attention in meeting the goals of SE4ALL

Conceptual framework

In the SAARC Region millions of women dealing with household energy are unable to contribute to enhancing energy efficiency and their potential contribution to conservation due to lack of clean energy options available to them at an affordable price and lack of clean energy technology options to facilitate their work. This situation demands a broader framework with social and gender equity principles and women and household energy inclusive path in the effort of providing sustainable energy for all in all the countries.

BACKGROUND

The context:

- With the declaration of 2012 as the UN year for sustainable energy for all, targets are being introduced by all the countries on RE development and Energy Efficiency and Energy Conservation (Three Es).
- Issues of gender inequality, energy poverty, energy access, affordability, energy needs of the marginalised sectors, are in the fore of many debates pertaining to SE4ALL by 2030.
- The drivers for SE4ALL in Asia is stronger- % of people not having access to adequate, reliable and clean energy is much higher.
- Two areas are important here; access to electricity and clean cooking solutions. In 2009, 493.4 million people in South Asia (excluding Maldives and Bhutan, accounting for 68.5 % were without electricity.
- Out of the total of 1814 million people in developing Asia, 1098 million are in South Asia. 69 % of population in South Asia rely on biomass.
- The energy consumption profile in Sri Lanka illustrate a household specific pattern with 39 %; industrial sector with 38 %, commercial sector with 20 %, street lighting with 2 % and religious uses with 1 %

ENERGY CONSUMPTION

* 'International Year of Sustainable Energy for All', has become another promise to meet women's energy needs.

Some features related to energy use

Country	Energy Use TOE		Biomass use TOE		Electrification rate	
	Total	Per Capita	Total	% Biomass	%	Population without electricity (millions)
Afghanistan	7.3	0.33	6.9	95	15.5	23.8
Bangladesh	35.1	0.25	16.6	47	41.0	95.7
Bhutan	0.5	0.71	0.3	60	--	--
India	529.2	0.48	106.0	20	75.0	288.8
Maldives	0.5	1.67	0.2	40	100	00
Nepal	8.5	0.31	7.4	87	43.6	16.5
Pakistan	81.4	0.52	23.4	29	62.4	63.8
Sri Lanka	7.4	0.38	3.6	49	76.6	4.8

Source: T. Siddiq Integrated energy potentials of South Asia, SAARC Energy Centre, Islamabad, 2008 and IEA, 2011*

HOUSEHOLD ENERGY OPTIONS

- The household energy illustrate the use of energy mix applied for cooking, lighting, mechanical operations, for various appliances, access to information, leisure, communication etc.
- The energy options available for the Hh sector in Asia include biomass, kerosene, diesel (farm machinery), solar power, electricity, LPG, and biogas.
- Women in rural areas are the providers and users of many forms of biomass; raw and semi-processed materials like charcoal and users of -direct solar energy, wind, kerosene, LPG, electricity, to satisfy the energy needs of the households.
- Use of sources, types and appliances for energy applications is highly diverse.
- It is influenced by energy access, market price, resource access, information on technology and also the household context and women's own capabilities and capacities.

TECHNOLGY OPTIONS

- Household energy technologies are important in getting maximum benefits of all forms of energy and in conservation and energy efficiency.
- The cooking related technologies are under the control of women and their use is rather flexible. This include cook stoves, kitchen appliances, refrigeration and cooling, ironing, grinding, blending and many other that depend on many forms of energy.
- Familial organization put pressure on men and women to adopt technologies and allocate their labour to undertake the conventionally expected tasks.
- The households individually organize their time, labour, and resources and make decisions and demand for specific forms of energy. Technology options for women means reducing the labour intensive tasks to modern energy based work reducing the drudgery and increasing the efficiency.

ENERGY TECHNOLOGY OPTIONS AVAILABLE TO THE HOUSEHOLD SECTOR FOR DOMESTIC COOKING

Technology options for cooking	Potential contributions	Constraints to adoption
Improved cookstoves	Higher efficiency and conservation of biomass, Reduced drudgery, saving time, enhanced indoor air quality and cleanness, reduced indoor air pollution,	Awareness on benefits, confidence, inability to meet multiple requirements, limitations of one model/ lack of options, poor service/ market mechanism. Low flexibility and inability to serve all cooking needs
Semi enclosed clay stoves	Higher efficiency and conservation of biomass, Saving time, labour; reduced drudgery by 30 percent, reduced smoke and air pollution,	Low flexibility,
Gasifier stoves	Increased efficiency, cleanliness, reducing drudgery, reducing indoor air pollution	Lack of access and awareness on technology and benefits, confidence, poor service/ market mechanism.

Biogas systems	Reduced drudgery of getting fuelwood, clean kitchen environment,	Lack of information, skills, awareness on benefits, confidence, poor services and institutional mechanism, financing.
Solar cookers	Clean cooking, reduced drudgery of getting fuelwood and cleaning.	Lack of access to technology, limited usage, awareness on benefits, financing, inability to meet multiple requirements, low level of confidence, poor market mechanism.
Solar water heaters	Ability to supplement, convenience, cleanliness	Lack of access to technology, low level of reliance, awareness on benefits, financing,, inability to meet multiple requirements, poor market mechanism.
Solar lanterns	Illuminate kitchen yards, Increased mobility	Lack of access to technology and financing

Blenders	Ability to supplement, convenience, cleanliness, reduced wastage and increased food savings.	Lack of capital investments, financing, high electricity cost, financing, poor services.
Electric ovens	Ability to supplement, convenience, cleanliness,	Low awareness on benefits, lack of capital investments, financing, high electricity cost, poor services.
Microwaves	Ability to supplement, convenience, cleanliness, reduced wastage.	Low awareness on benefits, lack of capital investments, lack of access to financing, high electricity cost, poor services.
Electric kettles	Greater efficiency, ability to supplement, time saving, reduce drudgery, convenience, cleanliness.	High electricity cost, capital investments,
LPG stoves	Clean cooking, reduced drudgery of getting fuelwood and cleaning, time saving.	Susceptibility to market, affordability, lack of capital investments, high recurrent cost, poor services, inability to satisfy multiple requirements.
Hot plates	Greater efficiency, ability to supplement, time saving, reduce drudgery, convenience, cleanliness.	High electricity cost, lack of capital investments, financing and inability to satisfy multiple cooking needs.
Grinders	Labour and time savings, greater efficiency, ability to supplement, reduce drudgery, convenience, cleanliness,	High electricity cost, lack of purchasing power, financing, inability to bear recurrent energy cost.

Electricity used by households by appliances (%) and implications on efficiency and conservation

Household Appliances**	Energy use %**	Expected benefits	Conservation and efficiency implications
Refrigerator	43	Reduced food waste, Stored food stocks,	Reduced food wastage and food expenditure, Availability of cooked excess food, Time and labour savings, Reduced drudgery of work..
Electric lamps	14.8	Illumination, Leisure and comfort,	Saving 40-50 percent of monthly energy costs, Safety and reduced fire risks Increased mobility, time use and labour use efficiency, Extended active hours per day/ Increased hours of work, Knowledge, education and information, social interaction, Health, safety and education, Clean intra-household condition, Entertainments,
Fans	17.2	Physical comfort	Reduced exhaustion & increased labour efficiency, Comfort of ventilation & intra household environment.
Rice cooker	7.2	Supplementary cooking	Cooking efficiency, Time saved for alternative work, Cleanliness,

Heater/kettle	3.6	Boiling water	Health, reduced drudgery, Time saving, cleanliness
Water pump	2.2	Water for common use,	Reduced drudgery, labour saving, Improved sanitation & hygiene, Reduced illness, Work efficiency, Irrigation for crops,
Computer	2.5	Education,	Enhanced capacities, information and communication, Investable technical abilities,
TV	7.2	Leisure & information,	Family relaxing time, Exposure to information, Knowledge & self-achievements, Entertainment,

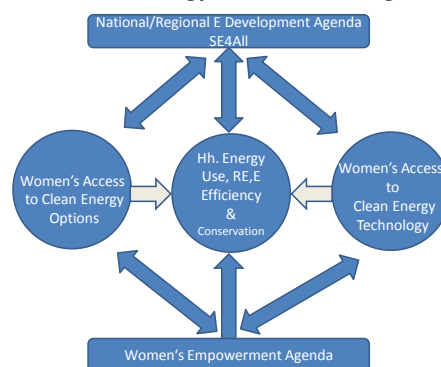
Enhanced efficiency and conservation		
These two are being combined to get multiple effects:		
Technology/ strategy	Output	Impacts
Electricity- * Energy efficient bulbs * Planned usage avoiding peak demand * Changing the behaviour of using appliances (Refrigerator) * Selection of appliances with energy efficient labelling * Planned activities (Grinding, blending, ironing) * Intra household living arrangements	Increased energy output per unit by 5 times, Lowered peak demand Reduced energy wastage by 10 to 15 percent Planned energy applications Combined activities	Reduced cost and per capita consumption Reduced electricity consumption Reduced cost and consumption Avoided tendency for fluctuations Increased services from a unit of energy
Biomass- * Increased efficiency in supplying and resource management, * Reduced dependence on wood alone * Changed biomass mix- Increased use of farm residues, dust and husks * Changing cooking practices/ preparations * Increased efficiency by using other energy sources	In-situ conservation by systematic harvesting Burning of materials with different calorific values Increased energy security by 20 percent Increased availability of solid biomass Reduced cooking time/ pots on hearth by pre-soaking, drying prior to frying Solar and smoke for drying, electricity for ironing, rice cookers for boiling rice	Reduced workload, drudgery and labour intensity, enhance economic activities undertaken by women and improving their lives Labour saving , increased time gap in harvesting and gathering, increased kilning efficiency Reduced drudgery and time spent in cooking and getting biomass for cooking Energy security, cost reduction, labour saving

Cooking technology- Multiple use of heat, smoke, Improved designs of hearths ,	More work performed by unit of labour/ unit of energy End use efficiency help reduce consumption by 30 to 35 percent	Increased availability of labour for alternative use Saving of 30 to 35 % of biomass reduced the time spend in getting one head-load per week. Fast attendance to stoves/ cooking, igning, Increased convenience, reduced exposure to smoke and particulates.
Improved cooking arrangements/ stoves on elevated surfaces,	Cooking efficiency, increased mobility, and reduced biomass burning time	Reduced drudgery of cooking and getting biomass for cooking Reduced repetitive engagement of labour,
Selection of right type and size cooking vessels	Faster cooking and less biomass required to , provide expected service	Time available for alternative use, Resource conservation and resource pressure, More time for resource rejuvenation
Combined cooking	Reduced per capita consumption of raw biomass and labour usage for food preparation. Per capita consumption has reduced to 1.6 Kg from 1.9 Kg by cooking two meals together for a family with 3 people.	
Solar energy Sun drying	Reduced commercial energy use /cost in food processing,	Total energy cost reduced by at least 5 percent. Increased food availability Reduced food wastage

KEY ISSUES

- Lack of merging mechanisms and integration
- Poor access to information by women,
- Poor energy service delivery and lack of integration,
- Lack of gender sensitive technologies
- Women's low income and specific programmes targeted at women,
- Financing for technology adoption including clean cooking energy solutions, kitchen improvements etc,

Household Energy and SE4All Linkages



Recommendations

- Turning back to the notion of universal access to energy extend beyond electricity access which meets only 20-25 % household energy needs.
- Women's access to clean energy options and technologies at affordable price is central to energy efficiency and conservation.
- The policies and programmes to be responsive to women and their energy; reducing the drudgery of labour intensive energy and technology usage; enhancing economies using women's time.
- Empowerment of women to have multiple energy options, clean energy and technology options to improve their lives, their families and the communities should be a priority.
- Energy technology options for women to decide according to their needs, suitability and capacities,
- Unsustainable energy applications leading to social, economic and environmental deteriorations should be taken into account under the initiatives of sustainable energy for all. One single form is not acceptable to all due to differential concerns over the affordability and acceptability.
- Energy information reaching women in different calibres,
- Financing and subsidies for technology adoption,
- Training of women in household energy technologies

Thank You





Women & Energy

Advocacy and Awareness Raising Measures

Qurat Ul Ain Ibrahim
Team Lead Gender Strategy,
USAID Power Distribution Program, Pakistan




Issues.....

- Issues at generation side of business
- Poor distribution and transmission infrastructures
- Low distribution of energy/ power in rural areas and urban areas
- Theft on energy lines
- Issues at government and political levels (instabilities/ lack of will / lack of funds)
- Increased usage of electrical appliances in the last ten years – mainly due to the easily available installment culture, thus burdening the existing supply system.
- Alternative ways of generating electricity not fully tapped and exploited
- Urban centers are facing the same amount of load shedding that semi-urban and rural areas




Activities consuming energy

Rural	Urban
Cooking	Cooking
Heating	Heating/Cooling
Lighting	Lighting
	Washing
	Luxury appliances & Others




Role of Women

- Traditional role is that of a housewife
- Not only limited to parenting but also running the household
- Strong energy interaction at the household level
 - Appliance buying decision
 - Appliance selection decision
 - Consumption decision




Diverse role in energy

- Women contribute to the design of household energy technologies and appliances
- As micro entrepreneurs marketing efficient and renewable technologies
- As operations and maintenance personnel for home based technologies
- As leaders and policy makers for micro-level energy interactions




Energy Interaction – Buying Decision

- Women usually decide what equipment to buy at the household level
- Type of equipment directly influences energy consumption

Area of Intervention

- Awareness to buy energy star products
- Awareness to buy products that will improve quality of living



Energy Interaction – Selection Decision

- Once buying decision is made, decisions need to be made about alternative fuel choices available
- What type of appliance is needed for fuel type selected?

Area of Intervention

- Awareness of pro and cons of each fuel type



Energy Interaction – Consumption Decision

- Once selection decision is made, decision needs to be made about utilization of appliance
- Extremely important when it comes to energy consumption
- Directly influences household budgets

Area of Intervention

- Awareness of cost implications of utilization
- Awareness of tariff mechanisms & savings potential
- Awareness of energy conservation



Conservation Opportunities – Solar Kitchens/Cookers

- Low cost implications per household as economies of scale kick in
- No fuel burning requirements hence savings of money
- Low environmental impact
- Reduction in associative health issues related to traditional cooking
- Reduction in time and effort collecting firewood leading to other opportunities of income generation
- Energy conservation potential due to renewable nature
- Energy conservation in reducing dependence on LPG



Solar Kitchen – Auroville India

- Community based solar kitchen
- Solar bowl has a thermal output capacity of 75 KW generating enough steam to cook about 1500 meals per day on average
- Designed as a hybrid system which runs primarily on solar energy and is backed up by diesel fuel
- Total efficiency ranging from 38 – 43%
- Total cost: 25,000 euros
- Project construction: 3 years



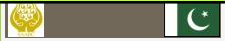
Barriers to adoption of new technologies

- Price is usually a huge barrier to overcome and policy makers need to come up with financing mechanisms
- Lack of technical expertise at the basic level
- There is usually an over-emphasis on technology and an under-emphasis of the user
- Products usually require a change in lifestyle which might be difficult to achieve at first
- Disconnect between user and purchaser. Usually it's the women who use while the men pay for it



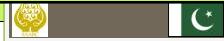
Women & Energy Interaction in rural areas

- Women are the primary collectors of wood and residue fuels for household use
- Time spent in fuel collection is high due to relative scarcity of available fuel leading to very high opportunity costs
- Negative impacts on nutrition and health because of incomplete combustion
- Safety in the kitchen is also a major concern because of inadequate design of cooking equipment



Women & Energy – Lost Human Resource

- Rural women spend most of their day either collecting firewood or cooking
- Much of their human energy is unpaid family labor.
- Being unpaid, they do not enter the market system hence keeping them out of the market discourse
- Compromises on other economic opportunities that might have been availed otherwise



Women & Energy – Lost Human Resource

- Need to collect data on the share of women employed in all the energy sectors
- Induction of more females 30% - 40%, particularly in consumer care and commercial side of utility operations, (act as consumer influencing agents)
- Promote gender friendly environments in utility organizations (motivational factor)
- Women's organizations should put more emphasis on the issue of "energy conservation"



Thank you

Women as change agents in fostering energy efficiency: case from Kerala, South India

Dr. R Harikumar
Head – Education & Training Division
Energy Management Centre - Kerala

SAARC Workshop, Dhaka
10-12 September 2013

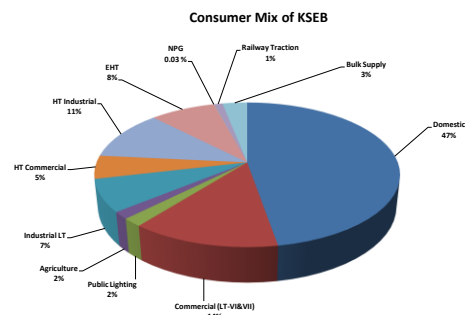
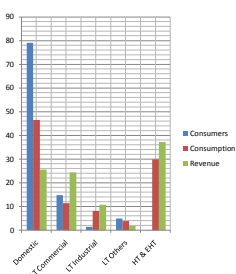
Agenda

- Kerala – energy scenario, in brief
- Energy Management Centre
- Energy Clinic
 - Program objectives, process
 - Impact
 - lessons learnt
 - Amendments – modified energy clinic
- Recommendations
- Summing-up



Population~3.18 million
Area~38863 sq. km(Forest~24%)
HDI ~ 0.746 (highest in India)

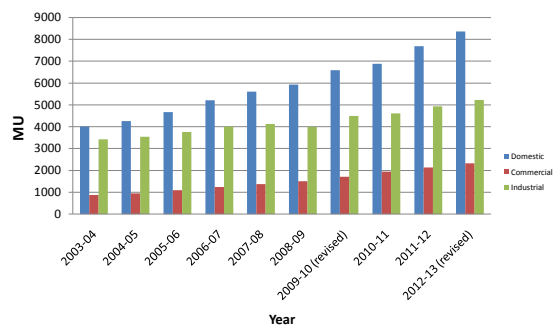
Annual Energy Consumption:
Petroleum Fuel~ 6 MT
Electricity ~ 12 BU; ~ 2900MW (Peak)

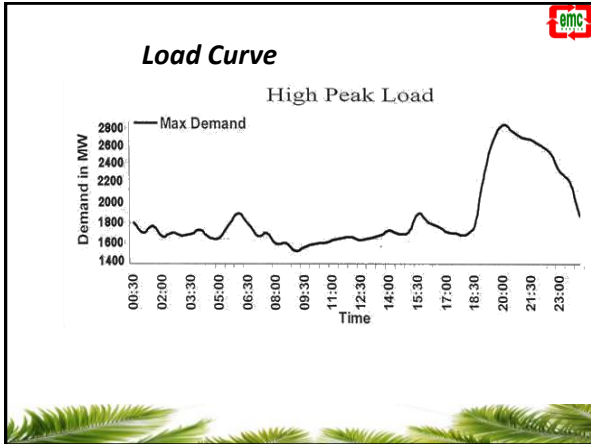


Electricity Consumption Pattern

Sector	1978-79	2008-2009
Domestic	11.5	47
Commercial	6	13
Small & Medium Industry	8.2	8
Large Industry	63.8	22
Others	10.5	10

Growth rate of Energy sales (2003-04 to 2012-2013) MU





Energy Management Centre - Kerala

Established in 1996, under the Department of Power, Government of Kerala, @ Trivandrum

First State level organization in India for promoting energy conservation and energy efficiency

State Designated Agency for the implementation of Energy Conservation Act 2001 (only stand-alone SDA in India)

Nodal agency of UNIDO on small hydro projects



finds that in Kerala

85 % of households use firewood for cooking.

domestic electricity use is >45 % of total

therefore domestic energy conservation makes *sense*

Decided to focus more in domestic sector

During the peak hours from 1830 hrs to 2330 hrs nearly 1000 MW is needed for meeting the lighting load, of which 75% is from GLS bulbs.

targets

All energy users and producers in particular

women - half the population and **children** below 15

targets

women

because they are the managers of energy, water and sanitation

targets

children

because they are the **affected** in tomorrow's energy scarce world



Energy Clinic



* Encon awareness for housewives

- ↓ conducted by trained women volunteers
- ↓ directly to housewives in homesteads
- ↓ demo-kit & ID card for volunteers
- ↓ 3 - 4 panchayats covered by each volunteer

Energy Clinic - Objectives

- spread awareness of basic concepts of energy efficiency and energy conservation in households
- share information on various clean energy technologies, applications and services with women
- equip women to make informed purchase and wise use in homes
- create revenue opportunities for women through retail of clean energy products and appliances

Research studies have concluded that at least 15 % energy savings can be achieved at the household level through awareness programs targeted at women

Energy Clinic - Process

- Selection and training of Energy Clinic Volunteers (ECVs)
 - Women...who have completed high school
 - can grasp technical concepts
 - can communicate with other women
 - demonstrate initiative and interest
- Capacity development of ECVs
 - Screening test
 - Induction and orientation program (one day)
 - Distribution of Identity Card and demonstration kits
 - Review of performance based on 3-4 classes conducted by ECVs
 - Annual refresher training
 - Remuneration 250 INR for 1 class/ 30 participants (150 INR) [panchayat + EMC]



Energy Clinic – ECV kit

- Identity card
- Training schedule
- Handouts (leaflets) and videos
- Exhibits – Charts and physical display material
- Order form
- Report form



Impact

- Energy conservation awareness
- Stimulator for women empowerment - ECVs elected to LSGs; thrust on energy efficiency programs
- Job creation
- Bulk discount passed to consumers (Oorja Store)



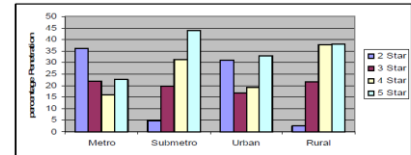
Impact - Employment generation

- Thaapabharani (ECV)
- CFL, LED assembly (Students)
- Solar lantern (Women NGO)
- Solar drying (Women NGO)
- Biogas plant (SEW)
- Improved Chulha (SEW)



Impact – EE equipment sales

Star Rating	Total sales	Percentage (%)
2 Star	124,387	24
3 Star	106,375	21
4 Star	119,313	23
5 Star	152,394	30
No rating	7,977	2



Penetration percentage of Star Rated refrigerators for different regions of Kerala

Impact - Recognitions

- Best State Designated Agency Award by Ministry of Power, Government of India to EMC – Kerala in 2008, 2010 & 2012



India Power Award for the Best DSM Initiative in 2010

Impact - Recognition

- UNIDO established its Regional Centre in EMC (SHP)
- USAID supported in establishing WISER



Impact – NGO linkage

- NGO exclusively working for encon has its beginning in Kerala & EMC supports them
- Professional body of certified energy managers & auditors of this country has its headquarters in Kerala; EMC extends support

Lessons learnt

- Awareness creation leads to energy conservation and efficiency
- Literacy plays a good role in program's success
- Environmental concerns and social obligation are factors in addition to cost saving
- Power cuts, load-shedding and cost hike (electricity & fuel) prompts encon
- Consumers aware on the need for encon; they want info on "how", "what to buy", etc.

Lessons learnt

- Enlightened consumers demand more services
- Women empowerment – umpteen programs; energy not a core issue
- Low priority for income generation/ job creation/ technological skill
- Interdepartmental linkage is a little low
- ECVs not getting enough participants for class
- NGOs act as catalysts

Modified Energy Clinic

- No classroom sessions
- House visits (20 houses as one unit/ INR 250)
- Case sheet
- Follow-up visits to understand impact

Need capacity building of ECVs

- Certified Energy Conservation Animators (3-day course + field visits + presentation)

For added services, need additional HR

Certified Home Energy Auditor (1 week course)

Recommendations

- Women as animators/ change agents
- Women as target group
- Establish linkage with essential services like health & water for better result
- Also education (literacy) & social welfare/ LSGs (women empowerment)
- Energy conservation awareness programs to be designed as a stimulator for women empowerment also

Recommendations

- This program as a vehicle for technology penetration to rural areas
- Gather field problems/ requirement in energy sector for exploring answers utilising the services of local educational institutions
- Also, as inputs for local level energy planning
- Use of local renewable energy resources should be a thrust area (improved chulha, biogas, pico hydro, etc.)

Recommendations

- Job creation should be a component
- Oorja store like added services
- Financial benefit, drudgery reduction, health impact, etc., as part of energy efficiency should be highlighted
- Encon awareness for students/children to be designed & implemented simultaneously
- Feedback analysis to be compulsory for amendments/ corrections



Summing up



**We have not inherited the earth from our fathers,
we have borrowed it from our children. - Unknown**

Thank You
hari@keralaenergy.gov.in



giz

Improved Cook Stove: A Pathway to Ensure Energy Efficiency and Women Health

Presented by:
M. Khaleq uz zaman, GIZ Bangladesh
at
Workshop on Household Energy Efficiency and Conservation
Organized by:
SAARC Energy Center and Power Cell
on
10-12 September 2013

giz

Traditional Biomass Stoves

- Different types of biomass stoves
- Charcoal, wood, agricultural residues, cow dung, briquette
- Inefficiency is due to
 - incomplete combustion
 - heat loss during heat transfer
 - during processing of fuel (e.g. charcoal processing)
- Inefficiency means: more fuel for cooking, more drudgery to collect fuel, more time to collect fuel and cook, more environmental degradation
- Inefficiency means more smoke that causes indoor and outdoor air pollution, which causes diseases
- Since women are responsible for collecting fuel and cooking, they suffer most

30.10.2013 Seite 2

giz

Effect of Smoke on Health

- Smoke contains small particles, carbon monoxide, toxic fumes (concentration many times higher)
- Result of smoke inhalation are chronic and acute diseases, e.g. headache, pneumonia, lungs cancer, asthma, eye diseases
 - Sufferings
 - Worldwide 4 million premature deaths (mostly women and children) every year
 - Cost for medicine

30.10.2013 Seite 3

giz

Traditional stove in rural Bangladesh



- 30 million households
- Efficiency: 5% - 15%
- Smoke in the kitchen

30.10.2013 Seite 4

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Impact of the use of traditional stoves

- Wastage of fuel
 - consumption of 80 million tons of biomass every year
 - fuel poverty
 - fuel scarcity leading to different social problems
 - use of cow dung as fuel (soil degradation)
 - deforestation
 - degradation of environment
- Millions of people suffer
- 14,000 women and 32,000 children die every year [WHO, 2006] due to indoor air pollution

30.10.2013 Seite 5

giz

Improved Cook Stove (ICS)

- ICS are efficient
 - better combustion
 - less heat loss
- ICS may be with chimney or without chimney
- ICS with chimney produces almost no smoke in the kitchen

30.10.2013 Seite 6

ICS in Bangladesh

ICS promoted currently in Bangladesh are with chimney and have following advantages compared to traditional stoves:

- efficient (efficiency 20% - 30%)
- fuel saving: 40% - 60%, 1 ton of wood and other biomass per year
- significant reduction of indoor air pollution,
- reduction of GHG emission (1.8 ton/ICS/year)
- acceptable by people
- usable for all types of biomass available
- locally available raw material
- sales price: 800 – 1200 Taka

30.10.2013 Seite 7



30.10.2013 Seite 8

Story

(from a small village in Tongibari of Munshigonj district)

- We visited this village in 2007. Our partner had installed some improved stoves there. Our purpose was to measure the efficiency of ICS and observe the overall performance of the stoves.
- We were working. One girl, about 15 years old, Khadiza, came to us. She started talking:
My sister-in-law was sick for long. We brought her to many doctors. We spent a lot of money. But she did not recover. Then the wonder happened. We bought an ICS six months ago. She started to cook. Now, all on a sudden she is no more sick. She does not take any medicine.

30.10.2013 Seite 9

Health Impact through ICS

- Women and children are the main beneficiary of ICS
- Health benefit for women and children are huge:
 - Less suffering from diseases
 - Less money to be spent for medicine: available for other purposes
- Universal adoption of ICS will save 46,000 lives yearly in Bangladesh
- Conservation of trees and forests will contribute to better environment that will foster better health
- Less time in collecting fuel will reduce drudgery of women and children significantly
- Less time for cooking will enable women more free time

30.10.2013 Seite 10

How far are we with ICS?

- BCSIR developed ICS in 1980s.
- GIZ started in 2006
- GIZ is working with many NGOs and micro-enterprises.
- We have reached only around 1 million households out of 30 million.

30.10.2013 Seite 11

Why ICS has not achieved universal penetration?

- Many reasons: not aware, cooking habit, affordability, etc.
- Most women are not aware about the disadvantages of using traditional stoves.
- Women are accustomed to cook in smoke and do not feel that smoke is dangerous for their health, although they suffer from headache, etc.

30.10.2013 Seite 12

Story from a village near Savar, Dhaka

- An old lady, may be 70, told to me:

If you brought ICS to us fifty years ago, I might have not to suffer my life long from asthma.

30.10.2013 Seite 13

Psychological Mistake Made by ICS promoters

- We - ICS promoters - are making a mistake:
We go to the women (who make their own stoves. Their mothers and grand mothers have also made their stoves.) and say directly or indirectly: your stove is not good; I have a good stove for you.

By behaving so, we have not noticed that we are hurting the women. Every person has a dignity; the woman also. By telling her stove to be a bad one, we are hurting her dignity.

- Our arrogant behavior is not taken well by stove users.
- To make the ICS attractive to the woman, we have to change our language how we approach her.

30.10.2013 Seite 14

How are we currently moving?

- We are interacting continuously with the users, partners, stove makers, entrepreneurs, and other people of the society and learning.
- The market is growing, the number of ICS sale is going up.
- Our entrepreneurs have sold:
 - In January: 10,000
 - In March: 25,000
 - In June: 35,000
 - In August: 55,000

Expected for December: 100,000
(There are also other organizations.)

- Bangladesh is preparing Country Action Plan for ICS.
- Our vision is to install ICS in every household of Bangladesh by 2021 (and ensure their use).

30.10.2013 Seite 15

WOMEN IN HOUSEHOLD ENERGY MANAGEMENT AND IN ENERGY GOVERNANCE SYSTEMS

Prof. Anoja Wickramasinghe
Emeritus Professor of Geography
University of Peradeniya
Sri Lanka

Coordinator:
National Network on Gender, Energy and Environment

SAARC Workshop on: Household Energy Efficiency & Conservation with women Participation, 10-12th Sept, Dhaka, Bangladesh

WOMEN IN HOUSEHOLD ENERGY MANAGEMENT AND IN ENERGY GOVERNANCE SYSTEMS

Questions in hand -

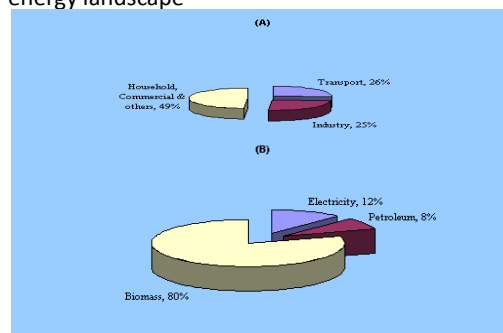
- Why should the household energy be treated in a priority?
- What roles that women play in Hh energy management?
- What is the position of women in energy governance?

APPROACH

Households include millions of informal organisations engaged in energy management; it is highly diverse includes a wide spectrum that extends beyond energy utility or the commercial types supplied through the formal stream. It also includes management of energy resources, supply chains, conversion and utilisation and also integration of energy into the household based livelihood. Women bearing household management responsibilities are also equipped with a key stake in managing the household energy.

WHY ARE WOMEN'S ROLES IMPORTANT

Stemming from the conditions of the total energy landscape



Women and the central energy hub

1. In the landscape women in the households handle a lion's share of energy.
2. Women contribute over 80 % of biomass energy.
3. Supply, conversion, energy applications and energy behaviour are integral to Hh
4. Hh and women illustrate informal practices in energy governance systems
5. women are in the hub of energy systems in most of SA countries
6. Hh energy is labour intensive, gender biased, heterogeneous, informal
7. System occupies women as producers, suppliers, converters, appliers and conservers.
8. Energy management goes beyond applications, managing the central hub of energy systems.

LARGE PORTION OF HOUSEHOLD ENERGY IS BIOMASS BASED This defines women's managerial roles in household energy

Household energy consumption in 2005 (Terajoule) by fuel type in some selected countries in South Asia (% are given in brackets)

Country	Wood	Dung	electricity	LPG	Kerosene	Natural gas	Other	Total
Bangladesh	271.1 (49.7)	27.2 (5.0)	34.1 (6.2)	910 (0.2)	30.3 (5.6)	75.2 (13.8)	106.6 (19.5)	545.43 100
India	2993.7 (49.7)	589.1 (9.1)	421.1 (7.0)	448.2 (7.4)	404.3 (6.7)	26.4 (0.4)	1178.4 (19.6)	6018.2 100
Nepal	124.4 (71.2)	13.2 (7.6)	3.0 (1.7)	1.6 (0.9)	11.2 (6.4)		21.4 (12.2)	174.8 (100)
Sri Lanka	54.7 (68.3)		11.5 (14.4)	5.1 (6.4)	8.7 (10.9)			80.1 (100)

GOVERNANCE

- Energy policy landscape of Sri Lanka consists of three tiers; national policy and strategies, Provincial statutes and the Divisional level by-laws .
- The informal practices of the end use units; the households play a silent role in energy management.
- Internally controlled practices are being applied to ensuring energy security, growth in cooking energy demand, changing cooking practices, and also by increasing reliable supply of biomass.
- Energy governance issues extend beyond formal governance assuring energy security of 80 percent of the energy used by the Hh (resource access, ownership, availability and the ability to procure enough resources).
- Division of energy related responsibilities within the household has structured special patterns in engaging in energy management; women in cooking energy and welfare related services, men with transport, draft animals and mechanical energy that lead to production enhancement.
- Patterns also differentiate labour intensive work done by women from the work with less labour required but more costly applications handled by men. Over 80 % of the commercial energy applications with 100 % related to transport energy is handled by men.

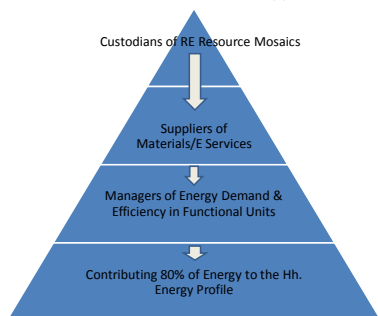
- Engagement of women in intra-household energy use and applications in the domestic domain is gender specific. Women make decisions on energy sources, types, use of appliances, bulb points, and also in reducing the cost of energy sources by using labour intensive types like biomass for cooking, water heating and ironing etc.
- Re-enforcement of women centred domestic energy management enables women to govern the composition of energy mix, biomass mix used in cooking; technology adoption including types of stoves and saving energy through the efficiency measures establishing energy saving stoves.
- Women are in the centre resourcing household energy requirements by deciding options, times and applying various forms of energy; electricity usage for additional work during off-peak periods; processing of agriculture products and food by smoke drying and sun drying; reducing use of biomass by preparing food for couple of meals.
- Meaning of energy governance is broader in regard to women. It includes efficiency in reducing the drudgery of work and ability to save labour. For instance efficiency in stoves is indicated by referring to reduced biomass consumption by 30 to 35 %, and possibility to reduce hours spend in cooking by 25 %, reduced smoke by 30 %, and also the time spent in providing fuelwood to the kitchen yard by around 30 %.
- Governance also includes technologies, practices enabling end users to get maximum output with minimum inputs or costs including their labour input. Such practices are to be compiled, disseminated and included into the national frameworks.

FIELD EVIDENCES

1. Energy is not equating with electricity- It is a energy mix serving different purposes, but a lion's share of energy and women are excluded from the formal system,
2. Energy management include management of informal system but energy mainstream is structured with commercial energy.
3. Households use mix of energy sources, labour and resource cost of energy to a households is heavy.
4. The consumption/ demand vary within and between households and also by the geographical areas. Women organise the demand, attending to labour intensive work and changing behaviour.
5. Household energy management is under the purview of women and their authority is greater on cooking energy/ NRE resources than on grid electricity or commercial types
6. The variability is driven by intra household factors, access to sources, ownership of energy producing assets; land, agroforests, trees etc; traditional practices, devices used and their efficiency, and the needs for having specific types for cooking, heating, lighting, ironing, drying etc.

7. Awareness on women's contribution to energy management is low among energy technologists.
8. In the present context **three crucial issues** are important,
 - a) **Women's rights to energy.** This is an overarching factor affecting the inclusion of the excluded sector 'women' into energy.
 - a) The second point revealing in all our countries is the need for **gender sensitive conceptual framework** for energy changing the ideology from 'providing energy for women' to have a inclusive approach that including '**energy by women**'.
 - b) The third is the **women's custodianship over energy.** From the stage of managing the resources; the RE and the sources to the level of intra household energy management women have a strong stake.
- 9 Existing formal governance system (national, provincial, divisional) is not inclusive of household and community governance

Energy by Women and Their Role in Household Energy



CRUCIAL ISSUES

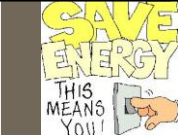
1. Women's rights to energy beyond their silence engagement in managing the household energy. (affordable energy, economic empowerment)
2. Women's energy custodianship into mainstream energy and the 'energy provided by women'.
3. Lack of conducive policy environment for including the excluded energies and the operational units, systems and the governance.
4. Women's authority over energy and institutional mechanisms to integrate conventional practices,
5. Poor capacity, lack of access to energy information and technology, energy extension services to work with women
6. Financial services for women and energy entrepreneurship.
7. Women's social organisations are not available to work with line agencies

Recommendations

1. Household energy inclusive framework capturing the energy provided by women in national policy and their custodianship into energy management and conservation strategies.
2. Household energy be placed in the fore of energy supply, demand management and applications. It is a unique operational unit for securing data, planning and implementation of sustainable energy development, expanding energy services for reducing poverty, gender gaps; advancing Hh economies.
3. Energy mainstream should include the energy mix that provides services to the household sector for engaging women as key stake holders,
4. Women inclusive informal energy governance approaches internalising energy management, bridging formal governance systems and informal practices.
5. National programme and institutional mechanism to increase awareness on conservation, energy efficiency, and management.
6. Women's social capital developing energy entrepreneurships by women and directing services including financing, training and representation .







Women & Energy

Efficient Energy Management at the Household Level

Qurat Ul Ain Ibrahim
Team Lead Gender Strategy,
USAID Power Distribution Program,
Pakistan




Challenges and Issues....

- Issues at generation side of business
- Poor distribution and transmission infrastructures
- Low distribution of energy/ power in rural areas and urban areas
- Theft on energy lines
- Load shedding
- Issues at government and political levels (instabilities/ lack of will / lack of funds)




Through Women...

- Target women frequented places to distribute flyers for energy conservation at the household level
 - Shops
 - Restaurants
 - Beauty Parlors
 - Other public places
- Use advertisements on television and articles in magazines to convey easy tips on energy conservation




- Parenting role of women
 - Teach their children about the benefits of energy conservation on a regular basis
 - Instill this ethic in children by doing it themselves (setting an example for children)
 - Make it a rewarding behavior for children (e.g. one piece of candy for switching off the light when they leave the room)




Through Government Initiatives...

- Encourage the public to buy energy star qualified products
 - They use less energy
 - They save money and improve quality of living
 - They help protect the environment





- Spread awareness of energy star products through:
 - Government TV channels
 - Newspapers
 - Electricity bills
 - Private and public billboards



Should be made mandatory to display the caption example:
"Save Energy for a Brighter Future"

Through College Principals, Teachers and Students...

- Organize awareness campaigns at girls' colleges and educate students about efficient energy saving habits
 - Energy saving flyers and banners
 - Prize winning competitions
- College students – “Energy Monitor Groups” visit households and personally convince consumers to save energy

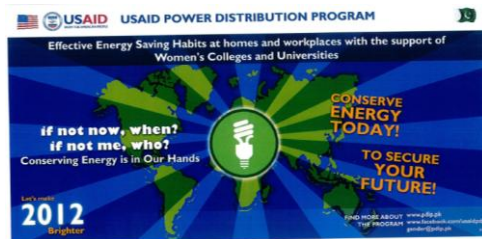
- College principals should work in collaboration with teachers and students and act as energy monitoring tools
 - Conduct campaigns on a regular basis
 - Conduct pre-project and post-project surveys to assess the effectiveness of the campaigns

Through Children...

- Educate children about easy energy conservation methods
 - Through cartoons
 - Through school plays
 - Through prize winning competitions
- Children are effective recipients and naturally motivating

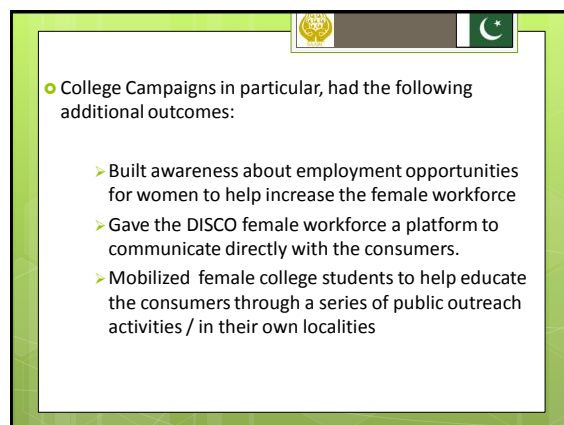
USAID PDP success story

- Gender specific awareness programs for energy conservation held by USAID PDP at girls' colleges in six DISCO regions
- USAID PDP Communications Team conducted energy conservation campaigns in schools



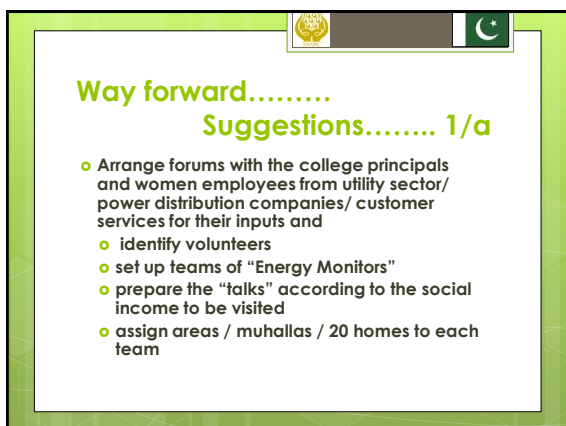


Communications Outreach



- College Campaigns in particular, had the following additional outcomes:

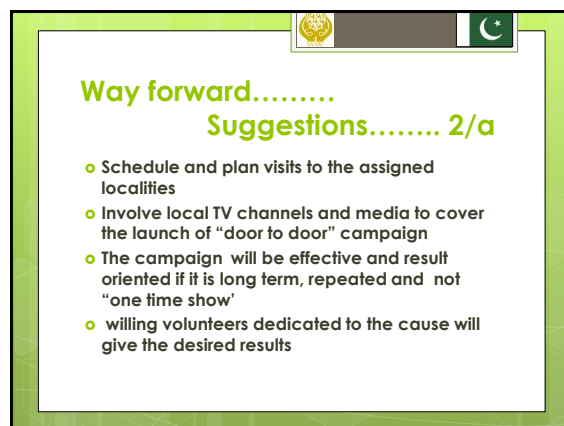
- Built awareness about employment opportunities for women to help increase the female workforce
- Gave the DISCO female workforce a platform to communicate directly with the consumers.
- Mobilized female college students to help educate the consumers through a series of public outreach activities / in their own localities



Way forward.....

Suggestions..... 1/a

- Arrange forums with the college principals and women employees from utility sector/ power distribution companies/ customer services for their inputs and
- Identify volunteers
- Set up teams of "Energy Monitors"
- Prepare the "talks" according to the social income to be visited
- Assign areas / muhallas / 20 homes to each team



Way forward.....

Suggestions..... 2/a

- Schedule and plan visits to the assigned localities
- Involve local TV channels and media to cover the launch of "door to door" campaign
- The campaign will be effective and result oriented if it is long term, repeated and not "one time show"
- Willing volunteers dedicated to the cause will give the desired results



Way forward..... Let's decide now..... 1/b

- Who will take the lead?
- Volunteers to come up with ideas
- Set up meetings for the forums to plan the activities
- Document the strategy, arrange regular meetings, formalize the action plan
- Start with 10 homes and two teams for three months – 2-3 visits in a month



Way forward..... Let's decide now..... 2/b

- Who will take the lead?
- Volunteers to come up with ideas
- Set up meetings for the forums to plan the activities
- Document the strategy, arrange regular meetings, formalize the action plan
- Start with 10 homes and two teams for three months – 2-3 visits in a month



Educate the Preacher to Educate the Public.....

- Make the public aware of the cost implications of utilization
- Estimating appliance and home electronic energy use to invest in a more energy efficient appliance
- Adopt an attitude to switch off unnecessary lights
- Encourage use of energy saving bulbs (share example of free distribution of free energy saving bulbs and recovery in small installments through the bills)..



Thank you



EMPOWERING WOMEN THROUGH EFFICIENT ENERGY INTERVENTIONS

JAGRITI

KULLU, (Himachal Pradesh) INDIA

CONTEXT

AGRO - PASTORAL ECONOMY - FOREST DEPENDENT LIVELIHOODS: GRAZING, FODDER, FUELWOOD, TIMBER, NTFPs ETC.



HARSH CLIMATE, REMOTENESS, POOR SERVICES IMPOSE GREAT DRUDGERY ON POOR HHs ESP. WOMEN;



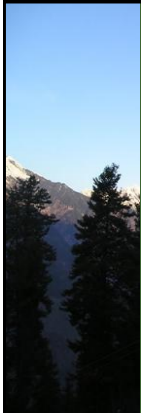
Context - 2

REPETITIVE, DAILY GRIND FOR WOMEN & GIRLS (*working upto 16 hours / day, 365 days*)

INDOOR AIR POLLUTION ADVERSELY IMPACTING HEALTH

DEEP ROOTED SOCIAL DISCRIMINATION RESTRICTS SCHEDULED CASTE SETTLEMENTS TO PERIPHERY – literally and in terms of social exclusion

OVER-EXPLOITATION & CONTINUED DEPENDENCE ON FOREST RESOURCES – RAPID DEPLETION OF AVAILABLE RESOURCES IN THE AREA;



THE ENERGY CHALLENGE

- AVERAGE HOUSEHOLD ROUGHLY USES 2000-2500 KG OF FIREWOOD A YEAR IN RURAL MOUNTAIN AREAS;
- BESIDES COOKING, FIREWOOD IS USED FOR SPACE HEATING, WATER FOR BATHING AND FOR WASHING;
- THE BURDEN OF GATHERING, CUTTING AND CARRIAGE OF FIREWOOD FALLS SQUARELY ON WOMEN & GIRLS;



THE ENERGY CHALLENGE - 2

- SHARP DECLINE IN REGENERATION OF SLOW GROWING SPECIES LIKE OAKS & PINES RESULTING IN HIGH FOREST DEGRADATION;
- DECLINING NATURAL RESOURCE BASE ADDS TO WORK BURDEN AND DRUDGERY OF WOMEN;
- INEFFICIENT & WASTEFUL USE OF FIREWOOD
- POORER WOMEN OVERBURDENED WITH HH WORK - ILLITERATE AND UNSKILLED FOR ANY REMUNERATIVE JOBS, UNABLE TO SUPPLEMENT HH INCOME;



JAGRITI (Registered in 2003 under Societies Act) IS A COMMUNITY BASED ORGANISATION WORKING FOR EMPOWERMENT OF POOR, DISADVANTAGED HILL WOMEN

JAGRITP's INITIATIVES

- **DISSEMINATION OF PACKAGE OF EFFICIENT ENERGY DEVICES, INCLUDING:**
 - LPG STOVES AND PRESSURE COOKERS;
 - HAMAMS (WATER HEATING DEVICES)
 - IMPROVED TANDOOR (SPACE HEATING)
- **PROMOTION OF ENERGY CONSERVATION MEASURES;** including CFL bulbs
- **PLAN TO PROMOTE PARABOLIC SOLAR COOKERS & INDUCTION PLATES** in future



STATUS OF ONGOING PROGRAMMES

ENERGY DEVICES								
LPG		Cookers		Hamams		Tandoor		
OC	SC	OC	SC	OC	SC	OC	SC	
309	367	173	34	633	849	116	127	
674		207		1482		243		

OC: Other caste, SC : Scheduled Caste

FINANCIAL MECHANISM

- **TO ENSURE WIDER USAGE OF DEVICES MEMBERS CONTRIBUTED 60-80 PERCENT OF THE COST; (60 % FOR SCs)**
- **MEMBERS ENCOURAGED TO TAKE INTRA GROUP LOANS FOR PURCHASE OF ENERGY EFFICIENT DEVICES;**
- **INSTALLMENT BASED FLEXIBLE RE-PAYMENT SYSTEM;**

INDICATORS OF CHANGE

- **NOTICEABLE INCREASE IN WOMEN'S PARTICIPATION IN DAILY WAGED WORK AND OTHER ECONOMIC ACTIVITIES;**
- **INCREASED SOCIAL MOBILITY AND ACTIVE PARTICIPATION IN DECISION MAKING PROCESS WITHIN AND AT COMMUNITY LEVEL;**
- **POORER HHS WILLINGNESS TO SHARE COST OF THE DEVICES AND REGULAR USAGE HAS SIGNIFICANTLY IMPROVED QUALITY OF LIFE AND SELF ESTEEM;**

BARRIERS TO MODERN ENERGY ACCESS

- **INITIAL HIGH COST**
- **FREE ACCESS TO FIREWOOD, WOMEN'S UNPAID WORK & DUTY;**
- **PATRIARCHAL DISPOSITION – SEEN AS LUXURY / WASTEFUL EXPENSE**
- **ABSENCE OF APPROPRIATE SCHEMES ESP. TARGETING/DESIGNED FOR POOR HHs**
- **LACK OF FINANCING TO FACILITATE EASY ACCESS TO ENERGY EFFICIENT SERVICES;**

IMPACTS

- **REDUCTION IN FUELWOOD CONSUMPTION:**
ANNUALLY 1.5 MT OF FUELWOOD SAVED
PER HH BY USE OF EE PACKAGE;
- **TIME SAVED:**
TIME SAVED IN COOKING AND IN FUELWOOD
COLLECTION- APPROX. 3 HOURS SAVED DAILY IN
ADDITION TO 12-13 hours saved weekly forest trips.
- **ACTIVE PARTICIPATION OF MEN AND CHILDREN IN
HOUSEHOLD CHORES: EASY AND CONVENIENT
SMOKELESS**

IMPACTS - 2

- **REDUCTION IN INDOOR POLLUTION:**



- **INCREASED SCOPE FOR ENGAGING IN
ECONOMIC & SOCIAL ACTIVITIES:**



LESSONS LEARNED

INTERVENTIONS IN IMPROVING ENERGY ACCESS
KEY TO IMPROVING ECONOMIC OPPORTUNITIES
FOR POOR HHS;

- **HIGH COST OF EFFICIENT DEVICES: A BARRIER TO
THEIR ADOPTION BY THE POOR, BUT WITH
ENABLING SUPPORT THEY ARE WILLING TO SHARE
COSTS;**
- **HH MEN MORE OPEN TO WOMEN PARTICIPATION
IN OUTSIDE ACTIVITIES, WHEN OPPORTUNITIES
FOR ENHANCEMENT OF INCOME ARE SEEN;**
- **LEADS TO IMPROVEMENT IN STATUS OF WOMEN
WITHIN AND OUTSIDE THE HH**

LESSONS LEARNED - 2

- **IMPROVED INCOME NECESSARY FOR REGULAR
USAGE AND MAINTENANCE OF DEVICES**
- **EASE OF USE AND PROVEN EFFICIENCY
ENCOURAGES OTHER HH MEMBERS TO USE
DEVICES CONTRIBUTING TO GENDER EQUALITY**
- **ADOPTION OF DEVICES TO CRITICAL LEVEL
ENSURES BETTER SUPPLY AND SETS IN MOTION
A RIPPLE EFFECT;**
- **USE OF PROVEN TECHNOLOGY AND ROBUST
SUPPLY CHAIN SYSTEM IMPORTANT FACTORS
INFLUENCING ADOPTION & REGULAR USAGE OF
DEVICES;**

SUSTAINABILITY

- 6 TO 7 YEARS AFTER COMMENCEMENT DEVICES BEING USED AND DEMAND FOR MORE;
- MEMBERS WILLING TO SHARE COSTS;
- IMPACTS AFFECT ALL MEMBERS OF THE HH;
- AFTER PROJECT COMMENCEMENT, SEVERAL NON MEMBER HHS PROCURED DEVICES;
- INCOME LEVELS OF MEMBERS UP AFTER ADOPTION OF DEVICES AND ENGAGING WITH IGAs;
- IMPROVEMENT IN HEALTH OF WOMEN

TRADE OFF BETWEEN UP FRONT COSTS AND RECURRING COST OF USAGE

GRADUAL TRANSITION:

PROJECT SUPPORT / INCENTIVES NECESSARY FOR CHANGING MINDSETS:

CREATING ADDITIONAL INCOME OPPORTUNITIES CRITICAL TO ENSURE EFFECTIVE USAGE:

KEY CHALLENGES FOR DELIVERY

- INITIAL RESISTANCE IN HH TO INVEST MONEY FOR WOMEN?
- GETTING WOMEN USED TO THE IDEA OF SAVINGS, then INTER-LOANING
- UNFOUNDED FEARS OF THE DEVICES
- OPPORTUNITIES FOR EXTRA INCOME MADE MEN MORE OPEN TO LET WOMEN PARTICIPATE
- RECURRING COSTS – A CHALLENGE – GOVT POLICY TO SUBSIDIES LPG COSTS FURTHER FOR FOREST FRINGE VILLAGERS? OR THRU PAYMENTS FOR ENVIRONMENTAL SERVICES MECHANISMS?

BEST PRACTICES IN EXPANSION OF ENERGY SERVICES FOR THE POOR

- TARGETING OF POOR HOUSEHOLDS
- COST SHARING
- FLEXIBLE AND LOCALLY APPROPRIATE FINANCING MECHANISM
- ALIGNING ENERGY INTERVENTIONS WITHIN THE ORGANIZATIONAL OBJECTIVES
- A PACKAGE OF ENERGY SERVICES

Role of Media on domestic energy efficiency and conservation

Dr. R Harikumar
Head – Education & Training Division
Energy Management Centre - Kerala

SAARC Workshop, Dhaka
10-12 September 2013

Energy Management

- **Energy conservation**
 - Switching off unwanted end-use systems
 - 60 Watt lamp, 80 lakh consumers, 480 MW, 50% realisation, 240 MW; Rs 0/W [Rs 8cr/MW]
- **Energy efficiency**
 - 60 Watt ICL with 14 Watt CFL
 - 46 W saving @Rs 150; Rs 3.2/W
- **Renewable Energy**
 - 14 Watt with solar PV; Rs 100/W

Mass awareness campaign

Subject thrust

- Supply-demand gap
- Cost saving
- Next generation
- Environmental impacts

Strategy

- Partnership (media house, utility)
- Celebrities & Leaders
- Local language
- Public involvement
- Give tips, prizes & Gain commitments

Targeting Women

- Malayala Manorama (120 year old Daily, 1.7 million)



മനോരമ
2012 മാർച്ച്
വില: ₹ 5

എലോഴും കൂട്ടായിക്കൊണ്ട്...

SAVE
₹ 50,000
₹ 25,000
₹ 15,000
SOLAR LANTERN

മനോരമ
2012 മാർച്ച്
വില: ₹ 5

വൈദ്യുതി ലാഭിച്ചാൽ സമ്മാനപ്പെരുമേ!

SAVE
₹ 50,000
₹ 25,000
₹ 15,000
SOLAR LANTERN

മനോരമ
2012 മാർച്ച്
വില: ₹ 5

അരയ്ക്കൈയും പൊടിക്കൈയും

SAVE
₹ 50,000
₹ 25,000
₹ 15,000
SOLAR LANTERN



Targeting Youth

SAVE
₹ 50,000
₹ 25,000
₹ 15,000
SOLAR LANTERN

Targeting Youth

SAVE
₹ 50,000
₹ 25,000
₹ 15,000
SOLAR LANTERN

- To send bimonthly bills
- daily reading register
- an essay narrating methods adopted, cooperation from family members and other personal experiences



Serve As a Volunteer for Energy

- To build up excitement competitions in cartoon, painting and crossword with energy saving as theme
- Selected entries were published



A K Balan, Minister for Power, distributing prizes



- Laptop computers, energy star refrigerators and large number of CFL worth total of Rs. 400,000 given as prizes
- sponsored by EMC.

Benefits

- 300 MW peak demand reduction
- Advertisement revenue of about Rs 5.5 million from ads on energy saving inserted by KSEB
- WAN-INFRA Award to Malayala Manorama

Circulation Growth (May-November 2008)

Month	Circulation
May 08	1611409
June 08	1644850
July 08	1666671
August 08	1666305
September 08	1693430
October 08	1693514
November 08	1728076

World Association of Newspapers and News Publishers (WAN-IFRA)

- World Young Reader Prize Winners – 2009
- TOP PRIZE: PUBLIC SERVICE - Malayala Manorama
- (Kottayam, India - 1.7 million daily) for SAVE (Serve As a Volunteer For Energy)
- WHAT THEY DID: The SAVE energy conservation community contest is an environmentally friendly reader participation opportunity that helps household budgets and the environment. The program creates awareness about the need for saving energy and provides practical methods for achieving that goal. With a clever acronym, which clearly labels the project and its purpose, this project uses competition to maintain momentum and interest. Children's personal stories are published along with the contests, puzzles and cartoons. Different media platforms are used to ensure the campaign is given a high profile throughout the contest and the campaign seems to generate its own energy. It not only created an awareness of the carbon footprint but also gave participants a constructive project to actually do something now, rather than just talk about the problem. Income revenue from advertising was another major advantage of this campaign.

Magazines & Newsletters





**Speech of the Honorable Secretary, Power Division
For
SAARC Workshop on Household Energy Efficiency & Conservation
With Women Participation**

Honorable Director from SAARC Energy Centre, Distinguished Guests from SAARC countries, foreign experts, guests from different sectors and dear participants Ladies and Gentlemen, Good Morning and a very warm welcome to all of you to Bangladesh.

It is indeed a great pleasure for me to welcome you all to the SAARC Workshop on **“Household Energy Efficiency & Conservation With Women Participation”** organized by the SAARC Energy Centre (SEC) in collaboration with Power Cell, Power Division, M/O Power, Energy & Mineral Resources, Govt. of Bangladesh.

SEC was set up with the vision to act as a catalyst for the economic growth and development of South Asia region by initiating, coordinating and facilitating regional as well as joint and collective activities on energy. The mission of SEC is to provide technical inputs to the SAARC member states on energy issues and facilitate accelerated integration of energy strategies within the region by providing relevant information, state of the art technology, policy support and expertise. One of the primary goals of SEC is to promote more efficient use of energy within the SAARC region. As a part of that goal, today’s workshop on Energy Efficiency & Conservation with Women Participation is being held here.

Distinguished Guests,

Energy efficiency is a soft energy path to reduce the over-use of energy and wastage through control, replacement of old & inefficient appliances with modern, efficient appliances. An effective and energy efficient selection of lighting, cooling and heating system in urban household, industrial and commercial installations can save energy in megawatts. One megawatt saved is one megawatt generated without a million dollar investment. Individuals and organizations are the direct consumers of energy. There is an urgent need to conserve the energy to reduce fuel dependence. It shall be an empowering contribution to the society as well as to the environment.

To implement Energy Efficiency programs skilled and trained personnel is essential. I strongly believe that from this workshop, the participants will acquire knowledge which will help them to conserve energy in their daily life.

Dear Ladies and gentlemen;

As you know, Bangladesh is striving hard to alleviate poverty like other SAARC countries since long. Energy plays a major role in the development and economic activities of any country. Government of Bangladesh has already given highest priority for the development of the power sector. Immediate, short term, medium term and long term plan for the development of power sector has been drawn up by the GOB. The government has been able

to add 4220 MW of electricity to the national grid in the last 4 and half years and more power plants are under construction and procurement process. But still we are suffering from energy and power crisis. We must use our energy resources in a planned manner to maintain sustainable development. To achieve that goal, GOB has given equal emphasis on increasing energy use efficiency. In the National Energy Policy Government has declared energy efficiency is the 3rd fuel for power generation.

Energy conservation does not imply avoiding essential use of energy for productivity and comforts. It involves avoiding wastages of energy without affecting productivity and comforts.

Dear Participants,

Towards that end, GOB has already set up an organization named “Sustainable and Renewable Energy Development Authority (SREDA)” with a mandate to look after Energy Efficiency, Energy Conservation and Renewable Energy issues. Other policy instruments are in the process of development to operationalize SREDA. The draft of Energy Efficiency & Conservation Rule has been developed and is in the process of approval. In the meantime, we have already prepared an Energy Efficiency Action Plan. In the Energy Efficiency Action Plan the government has set up a target of 10% of primary and secondary energy saving by 2015, 15% by the 2021 and 20% by 2030. Some interventions have also been identified in the plan.

To conserve electricity and to ensure efficient use of electricity implementation of Load Side Management (LSM) and Demand Side Management (DSM) programs are being implemented. Shifting peak load by changing shop closing times, staggering holidays, shifting irrigation load to off-peak hours (11 P.M.-05 P.M.), use of CFL bulb in Government & Semi-Government offices, distribution of CFL at free of cost, replacement of conventional street lights by LED and solar, replacement of single cycle power plant with Combined Cycle Gas Turbine, repowering of inefficient old power plants, limiting air-conditioner temperature at 25⁰C & above, reduction of technical and non-technical system loss etc. are being implemented by Government.

Distinguished Participants,

The SEC has given due importance on women’s involvement in energy efficiency issues through holding Workshop on “Household Energy Efficiency and Conservation with Women Participation” in Bangladesh.

Actually, I would like to mention that in Bangladesh, lots of women are involved directly & indirectly with power and energy activities. I am very happy to see that most of the workshop participants are women. I hope through this workshop, their knowledge will be enhanced and they will be motivated to implement Energy Efficiency and Energy Conservation programs. The Government has introduced the energy efficiency building concept in the National Building Code, introduced the energy efficiency issues in the national text book curriculum of school, madrasas and colleges and a wide program has been taken up to distribute

Improved Cook Stove through NGOs and development partners. All these activities have direct participation of the women in the energy efficiency sectors.

Dear Participants;

There is a saying “Charity Begins at Home”. If we rephrase it a little bit “Energy Conservation Begins at Home” and who best to teach than women. If the mothers of today’s child can teach and build up the habit of energy conservation in a growing child, I am sure in the later life that child will definitely conserve energy in his daily life.

Women in rural Bangladesh still prefer inexpensive, traditional stoves for cooking over modern ones despite significant health risks. Value added approach is becoming a need of the sector to take out those under-privileged people out of the poverty line, particularly the women who are economically more vulnerable. The issue of labeling the efficiency is getting voices and sustainability of the programmatic approach currently undertaken still need further attention. So, with the hope of major contribution from the women in our struggle for energy efficiency & energy conservation, I welcome you all to the workshop.

Dear Guests!

Energy conservation and energy efficiency is a multi-sectoral issue and different stakeholders within the government, non-government and private sectors must play an active role in reducing their energy consumption through efficient use of energy. There are lots of challenges as well. In view of the above, Government of Bangladesh has felt it as the need of the time to coordinate and harmonize the EE issue in the region. Also it is necessary to identify the barriers and their possible solutions.

We hope that the SEC will continue their support to catalyze the ingredients essential for scaling up EE & EC programs in the SAARC member countries. I also believe that the SEC would finally be able to establish a household energy platform to carry forward this sector coordination initiative.

Finally, I want to thank SAARC Energy Centre to facilitate this workshop. Special thank to Director SAARC Energy Centre. I also want to thank all participants from SAARC member countries; I also express gratitude to Power Cell, the Ministry of Foreign Affairs and other Ministries and department for dedicated support towards organizing this event.

Thank you all.



SAARC ENERGY CENTRE

697, Street 43, E-11/4, (NPF), Islamabad
Phone: 051-222-1943, Fax: 051-222-1937

Welcome Address by Mr. Shahzada Khalid Deputy Director, SAARC Energy Centre, Islamabad

Honorable Additional Secretary -Mr. Tapos Kumar Roy, Power Division, Ministry of Power, Energy & Mineral Resources, Government of the People's Republic of Bangladesh.

Distinguished Delegates from SAARC Member States,
Guests and Participants from Bangladesh,
Resource Persons,

Ladies and Gentlemen.

Assalam u Alaikum and a very good morning to all of you.

I am very pleased to see delegates from different SAARC Member States including Afghanistan, Pakistan, India, Sri Lanka and of course Bangladesh, joining this invaluable SAARC workshop focusing on house hold energy efficiency and conservation with the participation of women.

On behalf of SAARC Energy Centre (SEC), I express our gratitude to Mr. Tapos Kumar Roy, Additional Secretary, Additional Secretary, Power Division, Ministry of Power, Energy & Mineral Resources, Government of the People's Republic of Bangladesh for finding time to be here with us today and to inaugurate this workshop. Of course his presents Bangladesh's commitment to encourage and support all endeavors with respect to energy conservation and efficiency.

I would also like to acknowledge the cooperation extended by Power Cell in organizing this workshop. We look forward to maintain and enhance these linkages for further activities in the energy efficiency and conservation.

For those who are not aware about the activities of SAARC Energy Centre, let me take this opportunity to first make some introductory remarks about us. The SAARC Energy Centre was established in the year 2006 with the objective to have a regional institution of excellence for the initiation, coordination and facilitation of SAARC programmes in energy. It became functional in the year 2007 and during a short period of 6 years has emerged as the most vibrant and effective SAARC regional centre – 11 in all in different member countries. It is funded by the SAARC Member States and is supervised by a Governing Board represented by all Member States.



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The professional staffs selected from the Member States whereas expert services are also obtained through outsourcing depending on the nature of the tasks.

Since the year 2007, SEC has managed to develop international networking with a number of international organizations such as the UN, ESCAP, ADB, ASEAN, Japan, US and Germany.

Our program activities are focused on five thematic areas:

1. Energy Trade.
2. Integrated Assessment of Energy, Transport, and Environment.
3. Reducing Oil Imports through induction of Renewable Energy and Energy Efficiency.
4. Technology Transfer and sharing Best Practices.
5. Rural Electrification and Energy Poverty Alleviation

Our work program comprises studies, workshops and demonstration projects. In the field of energy efficiency, we have prepared on the directive of SAARC Summit, the SAARC Action Plan on Energy Conservation. I must add that it is a voluntary plan and does not propose any binding obligations. It has been circulated to all Member States for their consideration. We held a dissemination Workshop in Kathmandu a couple of months ago on Energy Efficiency in the Brick Kiln Sector to conclude our landmark study on the subject. We are engaged in a pilot project for field trials and tests of *SAARC Chullahs* (Improved Cook Stoves that have been designed by us) in various selected geographical regions so as to standardize them for introduction in SAARC region on a massive scale. Last month we held a workshop on Energy Audit and efficiency in Lahore Pakistan and end of this month we are organizing a Seminar on Role of Private Sector in Regional Power Trade in Delhi, India.

Ladies and Gentlemen,

The Workshop will provide an opportunity to concentrate on encouraging women to adopt household energy efficiency and energy conservation practices. The following are envisioned objectives of the workshop:

- (a) Share knowledge and good practices on energy conservation and energy efficiency in homes.
- (b) Promote energy conservation measures in homes through active participation of women.



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- (c) Measure local/ in-home through awareness raising on energy efficiency practices.
- (d) National level advocacy and capacity-building on these issues through women's organizations and regional "south-south" cooperation between South Asian countries.

Thematic Areas of Workshop:

The thematic areas of workshop are

- (a) To examine current thinking of women on energy conservation, including highlighting the advantages in adopting energy efficient household appliances, and defining and measuring potential impacts.
- (b) To share and review the participation of women in adopting energy efficient household appliances.
- (c) How different women organizations (private and NGO's) are promoting energy efficient household appliances and how successful they are.
- (d) To determine initiatives and way forward required to move in ensuring an conclusive approach.
- (e) Synergize SAARC Member States to integrate and mainstream policies to support women in the conservation of energy with their participation.

Out-come of the Workshop:

In this workshop, our expectations should be but not limited:

- (a) Understand and recognize women's role in promoting energy efficient house-holds for energy conservation through awareness raising on energy efficiency.
- (b) Provide a forum for networking between different stake holders at regional level and explore opportunities and challenges in the adoption of energy efficient house-holds with the participation of women through women's organizations and South-South Co-operation between South Asian countries.
- (c) Suggest ways and means to commit to integrate and mainstream women participation in the policies, plan and projects in the field of energy conservation.
- (d) A comprehensive report on the workshop proceedings and its recommendations.



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Finally, I would like to reiterate the commitment of SAARC Energy Centre to mitigate energy poverty through fostering energy cooperation within and across South Asia for a better tomorrow and I am extremely pleased to acknowledge the contribution of all of you in supporting our endeavors.

I once again welcome you all, Ladies and Gentlemen, to this beautiful city of Dhaka and hope that you will find some time to see the city. In particular, I thank Mr. Tapos Kumar Roy and Mr. Iqbal Ahmed for kindly attending this important event .

I thank you very much.