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With training such as this on improved stoves given at an energy workshop in Kunasi-Ghana in November 1998, women can become activists in organising improved energy services and redressing some of the environmental degradation caused by unsustainable energy practices. (Photo: Courtesy of UNIFEM)

## News from the Editors

### Implications of Renewable Energy for Women in Africa: Challenges and Opportunities

*Guest Editorial*

*Regina Amadi-Njoku*

**In Africa, electricity reaches only about 30% of the population, mainly those in urban areas.**

Hence, a major problem for rural people is the inadequate supply of power for lighting, pumping water, operating small workshops, and radio/TV, communication and security services. Petroleum product supplies, including diesel, kerosene and LPG are irregular and often subject to sudden price increases. Because of the

inadequate supply of these fuels, women trek great distances into the forest to collect fuelwood for cooking. It is estimated that fuelwood, charcoal and biomass residues from animals and agriculture, account for more than half of total energy consumption. Most of this is utilized for cooking and heating water in rural and semi urban areas and by the urban poor. It is frequently stated that there is a need to provide alternative renewable energy sources to enhance women's participation in, and benefit from, development.

Some progress has been made in the development of waste and biomass-to-energy conversion technologies. Sabina Mensah, in this issue of *ENERGIA News*, reports on a good example from Ghana of a

community, and particularly the women, benefiting from biomass-generated electricity. The best conversion methods are often capital intensive, as is the case with the Ghana project. The challenge is to make these technologies more accessible to rural people, especially those with low incomes.

## Energy and the environmental implications for women

**As long as** modern, efficient, energy technologies remain beyond the reach of rural people they must rely on more hazardous methods such as incineration and open burning. The hazards and health effects of burning solid wastes impact more on women due to their gendered responsibilities within the household, and include acute respiratory infections, chronic obstructive lung diseases, low birth weight and cancer and eye problems.

**Although there is** increasing recognition of the health implications for women from their use of fuel, there is less on the implications of climate change brought about by large scale fossil fuel combustion. Therefore, this issue's article by Fatma Denton is a timely awakening to the unrecognised implications of these global problems on women's livelihoods. For example, changes in sea level and currents may affect fishing stocks, and rainfall pattern changes will affect agriculture impacting on family food security, in which women in Africa play a primary role.

## Addressing women in Africa's energy needs are vital

**Increasingly we are** seeing renewable energy applications alleviating household chores for women and enhancing their economic activities, but their energy needs in community development have not been adequately addressed. For instance, renewable energy still plays only a limited role in rural clinics, lighting and community security, connecting rural areas to national affairs through telecommunications, radio, television, in distance learning and in educational programmes for the rural areas.

**The effective involvement** of women is critical to the adoption of sustainable energy systems in developing countries because women are frequently the primary users and providers of energy. Yet, they have rarely been included in energy project planning processes, or targeted as primary beneficiaries of energy services. Increased participation by women in the planning and implementation of energy projects could significantly enhance the overall effectiveness of these projects and, at the same time, improve the living conditions of women and their families. The Action Plan on Women and Sustainable Energy in Africa, developed at the recent Nairobi workshop (reported in this issue by Lydia Karanja), set out a number of approaches for increasing women's active participation in the energy sector.

**Since women have** generally been the primary providers of traditional energy resources, they have considerable experience in managing fuel use and availability. For centuries, women have managed forests and used forest products as fuel and fodder, and have in many cases developed sustainable ecosystem management methods that are now under threat. This knowledge is an important contribution they can make to energy planning, and so they should be active participants in designing innovative energy solutions, rather than viewed merely as passive consumers. Also, as Wendy Annecke points out in a thought provoking article in this issue, the process of acceptance of women's contributions by their male counterparts is not problem free.

**Moreover, women can** play a critical role as educators on management and use of fuels. With training, they can organise improved energy services and redress some of the environmental degradation caused by unsustainable energy practices.

**Energy planners' foci** must be more than just fuels; they should also consider women's labour. This is nicely illustrated in the case study by Nalini Burn and Laurent Coche on a women and energy project in Mali. The time and physical energy expended by women in performing survival tasks is one of the major barriers to advancing their education, personal development and income-generating activities. Better stoves and fuel supplies are not enough. Transportation of fuel, water and other materials is clearly a critical rural issue. Electricity for pumping water is also of importance since women often spend as much time and physical energy carrying water as they do searching for fuelwood.

**Many women have** very limited choice of energy input for economic activities. One way of promoting greater energy access for women would be to assist them in gaining credit for acquiring energy technologies and investing in productive enterprises. In most developing countries, women's share of credit from leading institutions is disproportionately small.

**Finally, there is** also the need to determine how women can remain in control of improved renewable energy sources. Experience has shown that as soon as technologies under women's control become more advanced they are hijacked by men, and women miss out on the advantages which can accrue. Project developers must be aware of this and incorporate strategies to counteract these effects. The UNDP supported project in Mali mentioned above and the UNIFEM/UNDP supported programme, Gender and Renewable Energy Systems Applications, are useful examples of addressing this problem and ensuring that it is women who are empowered.

## Capacity building in the energy sector

**It is desirable** that locally initiated development programmes take account of the multiple social roles of women. Grassroots women organisations operating in Africa should be encouraged to follow a more holistic approach when formulating and implementing strategies for providing sustainable employment and improving incomes. Networking could help to strengthen capacities and capabilities and so achieve these goals. *ENERGIA* can make an effective contribution through its commitment to building national and regional women and energy networks and, in particular, its women's leadership programme to develop women's capacity in the energy sector in Africa. ■



◆ Mrs. Regina Amadi-Njoku is the Regional Director of the United Nations Development Fund for Women (UNIFEM) Anglophone West Africa Regional Office, Lagos. She coordinates UNIFEM activities in Nigeria, Ghana, Liberia and Sierra Leone and supervises field-based personnel in the four countries. Before joining UNIFEM, Mrs.

Amadi-Njoku worked for numerous organisations. She has been a Vice-President of MayaTech Corporation, USA; a project coordinator for EDI, World Bank; and a member of the Coca Cola Advisory Board, Atlanta USA. She holds an MA in French and Comparative Linguistics, and an MBA in International Development. She has published widely and has travelled extensively in Africa, Europe and America. She can be contacted at:

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# Letters to *ENERGIA*

***ENERGIA* would like to support efforts made by women to secure employment in the gender and sustainable energy sectors by sharing with the rest of the network, information on the type of work that they would be interested in. Therefore, we invite you to send in letters like that of Jane Bridget Lynch published below.**

Dear *ENERGIA*,

Hi, thank you for your wonderful magazine, it is inspiring, informative and greatly appreciated on the other side of the world!

My name is Jane Lynch. I am 26 years old, Australian and have been working as an engineer in a small renewable energy research and development company for almost two years. I hope to work with women in community-scale appropriate technology, especially renewable energy, in developing and developed countries, as I believe it is extremely important that women everywhere have more input into the way technology is used in our world. I am also very interested in learning about appropriate technology from women from other cultures. In my current work I have been fortunate that I have been involved in engineering that I feel has the potential to make positive contributions to our world. Due to the small size of the company it has been possible to be involved in many aspects of engineering projects - project management, proposal writing, design and construction of equipment, experimental design, as well as practical work such as welding and gas plumbing. I have been involved in "Women in Engineering" advocacy programmes since 1992 and also with non-government organisations such as Community Aid Abroad and the Australia East Timor Association. My honours thesis in engineering involved the manufacture and testing of low-cost housing materials to assist the Philippines' National Shelter Programme and I subsequently spent a short period in the Philippines with other engineers working on the project. My main experiences in engineering are

in renewable energy and recycling of waste (wood, agricultural wastes, plastics) for building materials and fuels. I have also had some experience in tutoring science and speaking to groups on various aspects of engineering. Some of the things that I would like to become involved in are:

- Living and working in communities in both "developed" and "developing" countries
- Renewable energy
- Appropriate, community-scale, technology
- Working with women and other underrepresented groups in communities to ensure that they have input into the technology and engineering that affects their lives
- Working towards ensuring that children are protected and have all their physical, mental and emotional needs met
- Environmental sustainability
- Disaster relief

After almost two years of working in renewable energy I would like to become more involved in some of the other topics I have mentioned, particularly working in "developing" communities. I am currently beginning to look for this kind of work so if I am able to suggest any organisations who may employ me (paid or voluntary) I would greatly appreciate it.

Best regards,

**Jane Bridget Lynch, 18 Pulbrook Pde,  
Hornsby NSW 2077, Australia;  
Tel: +61.(0)2.4340.4911,  
E-mail: janelynch@hotmail.com**



To Members of the *ENERGIA* group,

I am delighted to see *ENERGIA News* returning after a long gap. I must congratulate all of you for bringing out a focused publication that is very relevant to everyone concerned with energy issues. I am basically a biomass energy scientist working at the Sinhgad College of Engineering (SCOE) and in association with a rural developmental organisation, Appropriate Rural Technology Institute (ARTI), in India. My work is concerned with R&D aspects of the use of biomass energy in rural India. Until coming across *ENERGIA*, I had not really given much thought to gender issues in this context - other than casually wondering why there are so few women scientists working in this area, which is so

important for rural women. The newsletter is certainly helping me to better understand the various aspects of gender issues in the energy sector. Keep up the good work.

Regards,

**Priyadarshini Karve, Sinhgad College of Engineering, Appropriate Rural Technology Institute, 6 Koyna Apartments, S.No. 133, Kothrud, Pune, 411 029 Maharashtra, India;  
E-mail: karve@wmi.co.in /  
adkarve@pn2.vsnl.net.in  
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<<http://members.tripod.com/ARTI India>>**



Hello!

I just received my copy of *ENERGIA News* 3.2 and thoroughly enjoyed reading it as usual. Having been actively involved in the Renewable Energy sector, I have always found the updated information on energy and gender issues in the magazine interesting. Thanks for forwarding the copy to my new address and I look forward to future issues.

**Kavita Rai, GPO 8975, EPC 4053,  
Town – Kathmandu, Nepal;  
Email: raiskb@wlink.com.np**



Dear *ENERGIA*

I am really impressed by the presentation and variety of topics discussed in your interesting newsletter: It gives me an inclination to look at issues concerning gender and energy. It is excellent and contains all the information I would expect and more. I have circulated the newsletter around the whole department.

Yours truly,

**Abdeen Mustafa Omer, P.O. Box 15007  
Khartoum / Amarat; Sudan**

*First of all could you please tell us about yourself and how you got involved in energy?*

I was born in Zimbabwe, where I had most of my education. I am married with three children (two daughters aged nine and seven, and a son aged three). I moved to South Africa with my family in 1994. I have got a first degree in Politics and Administration and a Masters Degree in Environmental Policy and Planning from the University of Zimbabwe. I have recently completed a Ph.D. in Environmental Management Standards with the University of the Witwatersrand.

I got involved in energy through my environmental work, and my interest in climate change and development issues.

*When and how did you get interested in gender issues?*

Being a woman, and having grown up in the rural areas, I have always had an interest in the advancement of women in development, as well as the development of gender-sensitive policies. It was therefore useful for me to get a good educational background on which to anchor my interest in gender and development.

*Tell us about the organisation you work for and what your role is?*

I work for an organisation called the Minerals and Energy Policy Centre (MEPC), which is based in Braamfontein, South Africa. The MEPC is a knowledge-based research organisation focusing on minerals and energy research, facilitation, capacity building, and information networking in Africa. The MEPC's stakeholder base comprises both the private and public sectors (including communities). The MEPC currently has two programmes in minerals and energy. I am currently acting programme manager for the energy section. The programme's work comprises several projects focusing on South Africa and the southern Africa region. We have projects on renewable energy, energy technologies, climate change, gender and energy, as well as short-term consulting projects such as Integrated Energy Planning which the MEPC is facilitating on behalf of the Department of Minerals and Energy. I am responsible for the development of new projects, as well as fundraising. I also supervise all the project work and manage project managers in the programme.

*Does the question of women and energy fit into your work? Is this a major concern of the organisation?*

The question of women and energy is part of our work at MEPC. We are currently in the process of building up the gender and women network in South Africa and the southern Africa region, having been asked to

## Meeting **ENERGIA** Members



### **Hesphina Rukato**

**Acting Programme Manager  
Energy, Minerals and Energy Policy  
Centre (MEPC),  
Johannesburg, South Africa**

*Interviewed by Sheila Oparaocha*

be the national and regional focal point for the two networks at the March workshop in Nairobi. The organisation has always had an interest in working with disadvantaged groups, and it is our belief that women's needs still have to be advanced in the energy sector, particularly given the important role that women play in national and regional economic development.

*What was your impression of the "workshop on women and sustainable energy" that you attended in Nairobi? Where do you think things should go from there?*

I was significantly inspired at the workshop. It was the first time that I had been part of such an energised group of people from Africa coming together to discuss women and energy concerns. The diversity of the group served to confirm the fact that energy and women is an issue that is currently receiving scant attention from energy policy makers and funding institutions. Concerns about capacity building, shortage of resources (both human and financial), and a lack of prioritisation of women and energy issues are common, and there is a need for a concerted effort in addressing these issues.

Having identified our common problems regarding women and energy, we need an African to champion this theme. This will serve to sustain the interest that was evidenced by so many people attending the workshop. We need a champion for women and energy in the same way that we had Graça Machel championing the cause of children in conflict and wars. At the

implementation level, we need to develop the capacity of field workers, policy makers and implementers so that they can start integrating women and energy issues into their daily work. We should also start implementing projects that show what exactly we mean by "women and energy". Once these projects become successful, they can be replicated elsewhere. This way we can get rid of much of the scepticism that surrounds the issue of women and energy, and at the same time give hope to many women that their problems can be solved.

*How is the South African gender and energy network coming on? What are the most important issues/activities that you feel you should address? What kind of support do you feel you need?*

The South African network is coming on slowly. A proposal for network activities has been written, and is currently being circulated to potential network members for their comments. We are also currently fundraising for our first national consultative meeting, and *ENERGIA* is being consulted on this. The Department of Minerals and Energy (DME) is hosting a women and energy workshop in December, and we hope to use this event to ensure that the South African network's activities are drawn into the mainstream gender policy processes and activities. For us it is also gratifying to see that the DME has seen gender and women as an important issue that requires their attention. I therefore hope that our network will be well-established by January 2001.

*Finally do you have any plans for the future in your work?*

Yes, we are currently fundraising for a three-year project on women and energy in South Africa and southern Africa. This work will be done closely with both the national and the regional network. The activities of the proposed project focus on policy, energy technologies, raising awareness, and the participation of women in small and micro energy enterprises. We are also planning to integrate women and energy issues into our current project activities.

*Thank you for taking the time to share your thoughts and experiences with us. We wish you the best in your gender and energy work in South Africa! ■*

◆ If you would like to know more about Hesphina's work, please contact her at:  
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**E-mail: Hesphina@mepc.org.za**



# International Programmes: Focus on

## UNDP Project on Energy and Women: Generating Opportunities for Development

**In February 1999, the United Nations Development Programme initiated a project entitled “Energy and Women: Generating Opportunities for Development”, co-ordinated by UNDP’s Energy and Atmosphere Programme (EAP).**

**The project investigates** linkages between women and energy as an entry point for addressing both sustainable development and the advancement of women, two of UNDP’s major priorities. Approximately two billion people – one-third of the world’s population – rely almost completely on traditional energy sources and cannot take advantage of the opportunities facilitated by modern forms of energy. Many of those who suffer the most from lack of energy services are women.

**The project assumes** that access to more efficient, environmentally sustainable energy services will benefit women and girls in developing countries, through giving them more free time, improved health, and increased opportunities for income-generating work. The geographical focus is on Africa, where large numbers of people lack modern energy services and where there is great potential for utilising renewable energy resources.

**The main elements** of the project include: analysis of sustainable energy projects regarding their impacts on women; networking and information sharing; training and advocacy activities; and technical assistance to assist in developing energy projects and policies that benefit women as well as men. The Energy and Women project

receives financial support from the Swedish International Development Co-operation Agency (SIDA) and UNDP’s Sustainable Energy Global Programme.

### **Networking and information sharing**

**To gather information** on linkages between women’s roles and energy usage in Africa, the project sponsored, in spring 1999, national consultations in southern Africa. National experts, government officials and leaders of community organisations discussed the energy situation in different countries in relation to women’s development needs and priorities. Reports by representatives from Angola, Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe, were presented at a regional workshop held in South Africa on June 21 and 22, 1999.

**At this workshop**, many concerns were shared about the need for more attention to women’s energy problems, especially in rural areas, and for more involvement of women themselves in solving them. Many similarities existed among the energy projects discussed, dealing with improved cook stoves, briquette making, wood lot management, PV panels, and solar cookers or food dryers. Participants were frustrated with previous pilot projects that were donor-driven, where expected users were not consulted, and stopped when the funding finished without sufficient follow-up or analysis.

**Major concerns raised** in the country reports included:

- Lack of energy services creates particular hardships for women.
- Lack of gender sensitivity in energy planning processes, policies and projects.
- National energy plans need to be expanded and improved.
- Past and current energy projects and

- policies need better analysis.
- Lack of participatory approaches in planning energy projects.
- Education and training is needed to increase the role of women in energy plans and projects.
- More public information is needed about energy options.
- Financing arrangements are essential for project continuity.

**Many of these** themes were again echoed at the March 2000 workshop in Nairobi organised by *ENERGIA* in collaboration with the Environmental Liaison Centre International. Participating in that workshop provided UNDP with an opportunity to gather additional information about ongoing activities in Africa involving women and energy resources, and to consult with participants regarding possible projects for case study analysis or for receipt of technical assistance through the Energy and Women project.

### **Training and advocacy**

**In order to** provide an introduction to linkages between energy policies and women’s issues, EAP has prepared a briefing paper “Gender and Energy: How is Gender Relevant to Sustainable Energy Planning?” which has been distributed to UNDP country offices, energy planners and gender specialists. It also forms a chapter in EAP’s new publication “Sustainable Energy Strategies: Materials for Decision-Makers” prepared for use in national training workshops under UNDP’s Initiative for Sustainable Energy, and designed to give policy guidance to governments and planners on how energy activities can facilitate sustainable human development.

**Project information**, and the Gender and Energy paper, were distributed at Beijing+5, the June 2000 UN General Assembly meeting to review progress five years on from the international forum on women held in Beijing. At the meeting, UNDP sponsored a panel discussion on Experiences with Gender Mainstreaming in Natural Resources Management, including a presentation on Energy and Women project activities.

### **Case studies publication**

**The Energy and Women** project is putting together a case study publication on linkages between sustainable energy initiatives and improvements in the situation of women. The publication should be finished in March 2001, for distribution to development practitioners and national and international decision-makers. This

publication is expected to contribute to the discussions on energy at the ninth meeting of the UN Commission on Sustainable Development in New York in April 2001. Several members of the *ENERGIA* Support Group have agreed to assist UNDP by reviewing the design and contents of the publication.

### **Technical assistance for pilot activities**

**The Energy and Women** project promotes pilot activities identified through national and regional consultations, and discussions are in progress with UNDP country offices in Africa concerning technical assistance in developing new proposals on women and sustainable energy.

**The expansion to** other countries of an ongoing multipurpose platform project in Mali, reported elsewhere in this issue, is being supported. EAP has also had discussions with UNIFEM about supporting activities in Ghana and Nigeria involving women and the use of renewable energy for food processing enterprises, and with Swaziland on including gender considerations in the new national energy plan.

**In addition, EAP** will support the monitoring and evaluation of a UNDP/GEF project in Uganda designed to establish financial and institutional mechanisms for supplying PV electrical services to households, businesses and communities on a commercial basis. A pilot credit mechanism is currently being established with a women's

bank, Uganda Women's Finance Trust Limited, which will allow women to purchase PV systems. ■

◆ For further information, please contact or: **Gail Karlsson, Project Consultant, 258 Broadway 5A, New York, NY 10007, USA; Tel: +1.(0)212.2674293, Fax: +1.(0)212.5871148 E-mail: gkarlsson@igc.org or Michael Pedersen, the Project Co-ordinator, E-mail: michael.pedersen@undp.org**

# **Networking Around the World**

## **Building Gender Issues into Sustainable Energy Use in Africa: A Regional Workshop for NGOs, Research Institutions and Governments**

*Lydia Karanja*

**Throughout Africa the daily lives of rural women are greatly influenced by energy access and use.**

**Although traditional fuels** occupy a dominant place in household consumption, the energy sector in many African countries has received little attention in terms of policy, planning and investment. Lately, considerable interest has been focused on integrating gender and energy issues into mainstream policy and planning in Africa, by energy organisations and women practitioners in the energy sector. *ENERGIA*, the Environment Liaison Centre International, and UNIFEM recently

convened a series of one-day national consultative meetings of non-governmental organisations, community-based organisations, researchers and environmental organisations. UNDP's Women and Energy Programme held a parallel consultation process. The participating countries included Angola, Botswana, Ethiopia, Ghana, Kenya, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe.

### **National consultation reports**

**Similar perspectives on** women and energy emerged from within the three sub-regions (Southern, Western, and Eastern). In Africa, the vast majority of women are primary users, providers and managers of energy. However, women's access to "modern" energy sources and technologies is limited by:

- Micro-credit schemes and financial institutions which favour men, and only provide short-term finance to women.
  - Insufficient knowledge on the improved technologies that is necessary to make informed decisions on technology use.
  - The energy-planning sector is male dominated and there are only a few women in key decision-making positions. Policymakers and planners have not integrated the special energy needs of grass-roots women in energy planning.
  - A lack of consultation on women's needs and requirements during technology design results in poor technical skills for solving specific technology problems. Some of the crosscutting issues that emerged from the meetings were:
  - Inadequate information about alternative energy technologies.
  - The low literacy rate among women is a barrier to the introduction of technologies.
- The major perspectives that emerged from

the meetings were a need to recognise women's concerns, to share experiences between stakeholders working on energy, and the recognition that gender and energy issues need to be incorporated into all aspects of energy policy and planning.

**It was within** this context that sixty participants from Africa, Germany, the Netherlands and the USA attended the Regional Workshop on Women and Sustainable Energy held in Nairobi, Kenya, from 13-15 March 2000. The organisers of the workshop were *ENERGIA*, ELCI, UNIFEM and Winrock International. The workshop brought together participants from governments, academic institutions and non-governmental and community-based organisations, with expertise, experience and an interest in gender and energy, in order to develop an Action Plan and a Regional Network.

## Action plan on women and sustainable energy in Africa

**During the Regional** Workshop an action plan was elaborated. The key principles of the Action Plan were:

- **Information:** in order to provide sufficient and accessible information on gender and energy to all stakeholders, there is a need to identify the different stakeholders - in the community, policymakers, mass media and researchers. Information can be disseminated through the mass media, flyers and booklets.
- **Finances:** in order to increase access to credit and financial facilities, more pressure needs to be put on governments, donors and funding agencies to provide finances for small-scale enterprises and project implementation.

The workshop brought together participants from governments, academic institutions and non-governmental and community-based organisations, with expertise, experience and an interest in gender and energy, in order to develop an Action Plan and a Regional Network.

- **Mainstreaming gender:** include a gender approach in energy proposals; all stakeholders should lobby and advocate for more attention to be directed towards the integration of gender and energy issues in national energy planning.
- **Technology:** to increase women's participation in the identification and development of affordable energy technologies and their utilisation, it is essential to carry out a needs assessment survey and to involve women in all stages of technology design.
- **Policy:** there is a lack of integrated and



Participants at the regional workshop on "Women and Sustainable Energy in Africa" held in Nairobi, Kenya from 13-15 March 2000

holistic energy policies to address gender and energy needs. Actions include advocating for gender to be included at all levels of energy policy, sensitising men in energy policy formulation, and advocating for the political will and resources required.

- **Education and training:** in order to increase women's participation in energy development, stakeholders should hold workshops and seminars, and involve local curriculum experts, and network and non-governmental organisation experts.

## Networking

**It was discussed** and formally agreed by the workshop participants that

- That the established regional network strengthens the existing information exchange capacity of the participating organisations;
- To improve networking, the stakeholders will translate the principles of the Action Plan into an interactive regional network with focal points in Western, Southern and Eastern Africa;
- In each sub-region, Southern, Western and Eastern Africa, a coordinating organisation will be identified to coordinate the regional network's activities.

**This is an** exciting time for the organisers and the participants of the Regional Network. We are all looking forward to continuing the proposed network activities to ensure that gender and energy policy, planning and project implementation get the recognition they deserve! ■



◆ The author of this report, Lydia Karanja, has a M.Env in Environmental Studies from the Kenyatta University in Kenya. She is currently working for the Environment

Liaison Centre International as the Programme Coordinator of the Women and Energy Programme.

◆ For more information, or to obtain a copy of the workshop report, please contact:  
**Environment Liaison Centre International, Energy Programme Co-ordinator, Off Muringa Road, Kilimani, P. O. Box 72461, Nairobi, Kenya; Tel: +254.(0)2562022, Fax: +254.(0)2562175, E-mail: paminafrica@iconnect.co.ke**  
 Or contact **the ENERZIA Secretariat**

the ELCI Secretariat would act as the co-ordinator of the Regional Network for an interim period of one year. As a first step, ELCI will draw up Terms of Reference which will act as the guiding principles for the network's operations. The workshop also envisaged the expansion of existing networks with focal points in Southern, Eastern and Western Africa.

## Where do we go from here?

**Following the conclusion** of the Regional Energy Workshop it was agreed:

# Rural Community in Ghana Benefits from Rural Electrification: The Appolonia Biogas Plant

*Sabina Anokye Mensah*

**Appolonia, a rural community in Ghana, has been used in a demonstration project as part of the Ministry of Mines and Energy's Renewable Energy Programme. Biogas, produced from cow dung and human excreta, is used to fuel a combustion engine for generating electricity. The system generates 12.5kW of electric power which is fed to a local grid, supplying 230V electricity for domestic use. The biogas system was commissioned in 1990 as a research and demonstration project which was aimed at establishing the technical and socio-economic viability of biogas technology as an alternate source of energy for cooking and decentralised rural electrification in Ghana.**

## The Bio-power plant

**Cow dung and** human excreta are the chosen biomass feedstocks for generating the biogas in this project. The village, though small, has a cattle population of over 1,400 and therefore has abundant cow dung which hitherto was an environmental threat and a source of disease to the inhabitants. Primarily men own the cattle, although a few women also have cattle. Human excreta are also utilised directly from two bio-latrines connected to the digesters, and also from public septic tank latrines in a nearby shanty town.

**The system has** ten digesters (each with a capacity of 50m<sup>3</sup>) in which anaerobic fermentation of the dung and human waste take place. The digesters, similar in style to the Chinese fixed hydraulic dome, are constructed from fired bricks and designed for a hydraulic retention time of 50 – 60 days. There are two floating drum gasholders, each with a capacity of 13m<sup>3</sup>, suspended in a cylindrical

bath containing water. The biogas produced from the ten digesters is channelled through rubber pipes connected in parallel into these two gasholders. The functions of these gasholders are to store the gas and to deliver it at a constant pressure to the engine. Two Indian manufactured 8kW diesel engines were modified to operate on a dual fuel mixture of biogas and diesel fuel. Diesel engines were preferred to petrol engines because modification is simpler. In addition, it would always be possible to continue running the engines on diesel in the absence of biogas without interruption. Furthermore, the know-how for repair and maintenance of diesel engines is locally available as they are the mostly widely used engine type for agricultural processing in rural Ghana. These two engines are coupled to two generators with capacities of 5kVA and 7.5kVA respectively.

**The community was** involved in the construction of the biogas plant, providing free labour for the unskilled jobs. The women obtained and supplied water while the men did the excavation work.

## System operation

**Three men are** employed to operate and maintain the plant. One task is collecting the dung from the farmers, and this has effectively excluded women from finding employment as biogas plant operators. Local custom does not allow women to enter cattle kraals to collect dung. The belief is that if a woman is menstruating it can cause a pregnant cow to miscarry and, since it is difficult for the headsmen to identify such women, they banned all women from entering the kraals. Women do not have to carry the water needed for mixing with the dung, unlike in many other biogas projects, since water is now pipe-borne to the village as a result of the project.

**The project is** still under the management of the Ministry of Mines and Energy who subsidise the salaries of the plant operators. The current fees paid by the beneficiaries are inadequate to sustain the project.

## Who has benefited?

**The electricity generated** is transmitted at 230V through a local grid over a total distance of about 1km and, to date, more than 20 houses have been connected to the local grid. In addition, various social centres (2 churches, 1 mosque, 1 video centre and 2 drinking bars) have also been connected. The Junior Secondary School in the village has also been electrified to enhance educational activities. Twenty streetlights powered by electricity from the biogas plants have been installed throughout the village. The demand for



electricity has rapidly outstripped the supply. The use of other renewable energy systems, such as solar PV, to meet this increasing demand is being investigated. Four houses have so far been supplied by solar power.

**Results from the** scientific monitoring of the biogas system at Appolonia show that the diesel-biogas system has reduced diesel consumption by 66% in comparison to pure diesel generation. Based on the data collected so far, it is estimated that providing the people of Appolonia with electricity for 12 hours from diesel alone would require 25 litres of diesel, while in the dual fuel mode, the system will consume only 8 litres of diesel and 40.8 m<sup>3</sup> of biogas. This is a saving of 17 litres of diesel daily. The cost of one alternative, grid extension, is distance dependent and only competitive with biogas power for distances below 6 km from the nearest grid line. Appolonia is about 10 km from the nearest power lines.

**The effluent slurry** that is a by-product of the conversion process is used as a high quality organic fertiliser, and so reduces the expenditure by farmers on chemical fertilisers. Studies have shown that the use of this manure could increase crop yield by over 20%.

### What are the gender implications?

**The use of** animal and human waste for the production of biogas for generating electricity has drastically reduced the health risks to the people of Appolonia. Through the project, the community has acquired access to a potable pipe-borne water supply to replace the stagnant and seasonal water that was relied upon previously. This has also resulted in a saving of women's time and drudgery. The introduction of electricity has improved the social life of the community. Nightlife has become very brisk with people gathering under streetlights, in churches, at the video hall and in the drinking bars to socialise. Schoolchildren are able to read and study at night and adult literacy classes are held in the evenings. The village has become a tourist attraction as people make excursions to the project site to see the potential benefits of biogas technology and its socio-economic impact on the people of Appolonia. This has

given rise to small-scale industries and the construction of new buildings.

**Men have benefited** from the electricity mainly through socialising; watching TV, listening to the radio and music, and drinking. The women, on the other hand, use the power at night for income generating activities and night-time cooking. The sale of food and other commodities takes place under the streetlights. Women can also sew and weave at night. The fact that the churches were also electrified facilitates women meeting together for socialising in the evenings. It is also believed that the reduction in the birth rate in the village can be attributed to the presence of electricity – there are now alternatives to night-time entertainment in bed. Overall, there is a general feeling that women have benefited more than men have from the electricity generated from biogas. ■



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## RESEARCH STUDIES

### Energy, Environment and Sustainable Development: Addressing Gender Concerns in Energy Research within the Commission of the European Community

The Technology and Development Group of the University of Twente (TDG), IT Power Ltd and Cornland International are carrying out a study on behalf of the Research Directorate of the Commission of the European Communities (CEC) to examine ways of achieving gender equity within the non-nuclear and nuclear energy research programmes of the CEC. The aim is to produce recommendations that will lead to a better integration of the gender dimension in future research activities. Work began in June 2000 and must be completed by January 2001. The findings of this and seven parallel studies in other research areas, will be presented at an international conference in 2001.

The team would like to hear from women in the energy sector within the EC and other industrialised countries to help define "best practice" for incorporating gender concerns in research and identify women's priorities in energy.

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## AWARDS

### New Ashden Award for Renewable Energy

The Ashden Trust has joined forces with the Whitley Awards Foundation to launch the Ashden Award for Renewable Energy. The Ashden Award is offering up to £30,000 for an outstanding renewable energy project. The

Award's aim is to support a project that will provide support to a rural community in a developing country, in a way that alleviates poverty and improves the quality of life, while remaining fully responsive to existing cultural values. The project would need to provide an energy source either for income generation, agricultural activities or for improving educational or healthcare facilities. The project should have an exemplary value, that would encourage the use of environmentally friendly, sustainable sources of energy in similar contexts. Completed application forms for the award should be received by 15th October 2001.

◆ More information about the award can be found on the Website at:

**www.whitleyaward.org or  
Email: info@whitleyaward.org**

# From the Kitchen to the Boardroom: Reflections on Power Relationships in Gender and Energy Practice and Policy

Wendy Jill Annecke

**This article is based on a presentation given by Wendy Jill Annecke at the *ENERGIA* workshop in November 1999. It is different to many of the other articles that have appeared in *ENERGIA News*, dealing more with conceptual issues rather than field experiences. The editors consider that it raises some interesting and thought provoking issues about the way we approach trying to ensure that women's energy needs are incorporated into policies. Wendy argues that in order to succeed in identifying energy needs it is not sufficient to accurately describe women's roles but, rather, that we have to look in a broader context at the social and power relationships involved in day-to-day activities.**

**As a number of** women who have been working in gender have been proposing for years, this paper assumes that, as gender and energy experts and activists, we really want to "change the paradigm". I would suggest that we are not doing terribly well in this regard, and offer a possible new way forward. One reason that we have been unsuccessful in incorporating women into policies is that we try and draw distinct causal relationships between women and energy by focusing on women's roles, and then attempt to ameliorate or enhance them. We remain, in our research and implementation, at the level of description – often excellent, insightful description - but we lack an understanding of how the situation might change. While addressing symptoms, we know that energy is a necessary but insufficient condition for development, and that the vital condition is a redistribution of power and resources - but this is very difficult.

**To begin, I** propose that we take a new look at some questions of power and gender in the energy sector. Relationships between people are permeated by their gender. Power, as we know, constitutes an important element in the relationships between gendered beings, and these relationships are in a constant state of flux. To explore some of those gender and power relationships, and how they change, I will first employ some self-reflection by examining one of my roles – as a woman and a mother. More specifically I unpack the stereotypical, energy-related, routine

activity of cooking for a family. Then I look at a similar role performed by a woman in a very different socio-economic situation. I offer these insights tentatively, cautiously proceeding from personal experience, but suspecting, intuiting, that there is some significant material here which should enter the debates on what gender means in social and economic contexts, and how our understanding of this may play a part in our approach to energy policy, projects and markets.

**I want to** get to a point where I can argue that understanding (let alone changing) the relationship between women and energy-related activities is not possible within a narrow sectoral view of women and energy projects. Rather, we have to look more broadly at the social, and in particular the power, relationships involved in day-to-day activities, and be prepared to work in more interdisciplinary and democratic (anti-hierarchical) ways if we are to succeed.

## Domestic responsibility: 1

**At 34 I** had two teenage children and a relatively new male partner. Previously, as a single parent for ten years, I had cooked every night while the children were growing up, and I continued doing this for several years after my partner, Don, and I started living together. For whatever reason, guilt, socialisation, habit, as a good mother and loving partner I did it! Come evening I would be in the kitchen organising, chopping, peeling, monitoring the stove, while the family would be popping in and out making coffee, asking about homework, chatting, ironing a shirt, feeding the pets and, if I was lucky, laying the table under my direction. I was in control, not always willingly, not always with a Happy Mother smile, but there I was, dominating the space, directing operations, managing the expertise, and providing in a number of ways.

**One change made** possible by Don coming into our lives was that (apart from numerous work and parental responsibilities) I became very politically active in a women's anti-apartheid organisation. I could do this because Don was there to look after the children. When I first started attending meetings every Wednesday night I still managed to fulfil my motherly and wifely duties by making supper early and leaving it in the oven. After a while, Don took over making supper on Wednesdays. I remember watching the relationship between him and the children deepen because of this time they spent together without me and depending upon each other – and feeling pleased, and probably guilty, about not being at home all the time. I made sure I did other things such as bake over the weekends to "make it up" to them – especially as the political heat increased and we had comrade-refugees staying in our house, a duty roster for Saturday afternoon funerals, regular arrests, and endless other pressures. The electric oven produced delicious smelling symbols of nurturing which I thought made up for my frequent absences and provided evidence of my caring.

**The children grew** and the relationships between us changed. I was trying to study again, and the political struggle was grim and exhausting. After eighteen years I was tired of being responsible for supper most nights of the week. One night, soon after my youngest child had finished school, I announced that I wasn't going to cook supper any more. Each person would now be responsible for cooking and cleaning on one night (over the weekends we would fend for ourselves although I would see that the cupboards were stocked). It was not exactly revolutionary thinking from a feminist-in-training, not a lot to expect from nearly grown-ups and grown-ups, and I should note that, after the initial surprise, there was enthusiasm and acceptance.

**The issue here** is my response to my liberation. Having wanted and directed this change, I found I couldn't implement it. I couldn't keep out of the kitchen at suppertime. I noted myself being present: questioning judgements, offering advice, reminding what else needed to be done. How difficult it was for me to give up control of the kitchen and supper routine! Unbeknown, or unacknowledged by me, an important part of my identity had become defined in doing these useful and nurturing activities.

## Domestic responsibility: 2

**I want to** move on now to an illegal informal settlement, Canaan, where I was involved in a women's group resisting forced removal. Most of the women were refugees from the townships around Durban and had fled the political violence that racked KwaZulu-Natal in the run-up to the first democratic elections. The women were very poor; they were rebuilding their lives, and constructed their houses from materials scavenged from a municipal dump. Because of political suspicion and fear, they kept largely to themselves. Most of the women were not formally employed, and divided their time between caring for their children, doing domestic tasks and the dump.

**I will describe** one of the many evenings I sat on a bed in Gretta's shack both observing and participating in the evening cooking routine. Preparations began in the early evening and, including cooking, could take up to three hours. I watched Gretta's demeanour change as she took charge: her shoulders straightened and her voice deepened. Children were sent to collect *mfino* – greens which grew wild. When they came back they were sent out to buy a litre of paraffin. Water was put on to boil. Salt was found and added. Mieliemeal was measured and sprinkled into the boiling water. On this particular evening, as a special treat, there was thick sausage given by a neighbour who had been to her rural home, and whose children Gretta had cared for. The single flame cooker meant that the sausage had to be fried once the *phutu* was cooked. This all took some time. A school-going child sat next to me and did his reading homework, the other children ran in and out, asking several times when supper would be ready. Gretta's partner came in, sat on the bed and turned on the radio. His legs got in Gretta's way and after a while he got up and walked out, telling the children to call him at the shebeen when supper was ready. This is an interesting reflection on whose space this was: Gretta's authority was absolute; her position was central, not only physically but also to the endeavour.

**Gretta continued her** tasks, then served the food, deciding who should have what. She served herself last and sat down in the corner to eat. When I looked up she was suddenly smaller, bent and quiet. The children started talking again and her partner spoke above them. When eating was over, the plates were cleared and stacked without her moving. Her presence and importance had diminished and this continued as the squabbles about clearing up and going to bed took over. Her partner reprimanded the children and sent them to bed.

**What these two** cases show is that, despite the differences in privilege and position, there is ebb and flow of power in day-to-day relationships within households. Cooking, in both cases, was a form of empowerment and control for the women, even if it was found burdensome at times. However, they need not realise the significance of the task, the family, and the practical and structural facets of oppression.

**From these two** tales of everyday life of women, with all their similarities and differences, we can move on to wider issues of family and oppression, exploring ideas on the location of power which may be helpful when we have to think strategically about influencing policy and planning.

**Clearly, cooking – standing** here for the everyday experience of 'the family' – is not in itself equally oppressive to all women. For me, the continual expectations and responsibility for thinking about "what's for supper, mum?" was burdensome. Gretta's burden - not having enough food – was of a different order of magnitude, as are the physical demands placed on rural women by the collection of fuelwood and water. It is noteworthy that many women enjoy cooking if it is for a celebration or a special occasion, demonstrating that, under certain conditions, women are able to identify the pleasure or the advantage that we derive from performing this activity.

**Generalising from my** own experience I posit that democratising these tasks leads to a loss of authority and that relinquishing any form of authority is difficult. The degree of difficulty may vary with heightened cognisance and/or similar authority in other identities. Energy projects, even when aimed at income generation, need to offer women more than a reduction in their primary power relationship. They can do this, step-by-step, through increasing strategic knowledge among participants and by providing an ability to change the discourse of roles.

## Generating and balancing power relationships

**The need to** understand our own exertions in search of power was further brought home to me when I asked several women: "how would you react if your husband suddenly became a feminist?" or "what would your reaction be if the government passed a law enforcing communal childcare?"<sup>1</sup> The response which concretised my intuition and gave me insight was: "Hey! I wouldn't trust him."

**Isn't that how** we think? Hey! I wouldn't trust my family to do supper properly, and, anyway, if I did relinquish this power, then I wouldn't trust them to still honour me. Hey! Men don't trust women to write policy and do planning – and if they do patronisingly give us a chance, who is to say we'd still respect them when we discovered we could do it ourselves? Hey! The northern planners and funders don't trust us women energy experts in the south to know what we want for ourselves, because if they do, and we do things our way, they might lose their power and control over us.

**We set considerable** store by being able to understand the decision-making process in the energy sector - what choices, however constrained, about fuel, food and appliances, are women making? A strategy we use to determine power relationships in households is to gain an understanding of the decision-making processes. Why not use this strategy to begin unpacking power relationships and asking why things continue as they do? Who

<sup>1</sup> I owe this idea to Joan Meyer's "Power and love: conflicting conceptual schema"

commands the power and does not trust us enough to share it? Who has sufficient trust? Decision-making processes will be better understood if they include an analysis of hierarchical positions and cultures as well as race, class, gender, age, etc.

**The concept and practice of power** is the key here, and an adequate feminist model of power would have to acknowledge that, while power can be a potentially positive and enabling force, sharing it requires a degree of trust and negotiation. Unfortunately, there is little agreement among feminists on where power is vested or located, and how it could be shifted and shared. What we need is a concept of power which enables us to link agency to structured relationships involving domination and subordination and which, at the same time, allows us to reinstate women as agents without blaming them for social inequities. Work has to be done by and with all the agents involved.

### What can we learn from this?

**If we could** change the social relationships of subordination and domination what difference would this make? It is a mistake to equate social change with institutional change – in South Africa we have learned bitterly that much institutional change does not profoundly affect people's everyday lives. Taking over the state (or development) apparatus is meaningless if it means simply adopting the very system that we wanted to abolish.

**I am not** suggesting that the resolution of individual problems, or women and energy projects, or even gendered energy can lead to a political system. Foucault (1980) maintains that no profound changes will take place in society unless the power mechanisms (such as gender discourses) that run parallel to sovereign power are changed in tandem. We have got to look at, understand, and analyse the micro-interactions throughout the system. Only by doing this can we establish the direct connections between the gender-incorporating power-relationships operating from the kitchen to the boardroom.

**An example of** this from the energy sector is Bronwyn James' (1999) analysis of the process of writing the first post-apartheid Energy White Paper in South Africa. James looks at how the interactions among race, gender and power operating in an institution (the Energy and Development Research Centre where I work) played a critical role in the writing of the new energy policy, and how women, despite their efforts to organise, were systematically marginalised out of the final writing process by men with higher status both in the EDRC and in the Department of Minerals and Energy.

**James' attention to** the shifting and differing positions throughout the process provides valuable indicators as to how power relationships can be examined and understood. Comparisons with the relationships in the Canaan experiences referred to earlier can be drawn in terms of the disciplinary discourses of trust and competence. The male hierarchy simply did not trust the ability of women to produce policy on anything other than domestic use of energy, and in so doing ensured that women continued to lack the expertise and experience in the petroleum and electricity sector that would alter the balance in expertise. (Initially men also lacked this competence but they were given the opportunity to acquire it while women were not.) James highlights the need to know the content of the sector, but I have the feeling that women, if they had been trusted, would have done a better job of writing a holistic energy policy, integrating the sub-sectors and ensuring empowerment of the previously disadvantaged community. This would have been achieved not only through the establishment of black-owned petroleum companies (which changes only the colour of power

relationships), but also through engaging the agency of the majority of domestic users and eventually shifting the paradigm.

**If adequate gender policies** were implemented at international, national and local levels then we would be a great deal closer to an egalitarian society. At the moment this remains a Utopian dream. It is heartening, however, to remember that *ENERGIA* is doing precisely what Foucault recommended in order to contribute to changing the relationships of power and, eventually, the paradigm. He argues that to create alternative mechanisms of power we need to investigate, both historically and in the present, how concrete mechanisms of power function; and we should construct strategies such as power networks that are anti-disciplinarian and non-coercive. This is precisely what a network such as *ENERGIA* could achieve if it works horizontally (*not* hierarchically) and democratically, and pays careful attention to individual agency and local conditions.

**An implication of** this is that those of us in positions of power – as mothers, lovers, researchers, funders or workers – should not insist on maintaining our authority. We must be willing to listen more and do less, trusting in the ability of those less powerful to be competent or to develop competence.

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This paper is a much reduced version of a paper presented at the *ENERGIA* Workshop held on 2-3 November 1999, which will be posted on the *ENERGIA* website. It remains very much work-in-progress, as well as somewhat elliptical – more theorised than theoretical. A fuller version of the paper, including a substantial bibliography, is available from the author and it has been submitted for publication elsewhere. ■



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Fatma Denton

# Gendered Impacts of Climate Change - A Human Security Dimension

**The contribution of women to environmental policy is largely ignored.**

**Decision-making and policy formulation at all environmental levels, i.e. conservation, protection and rehabilitation, and environmental management, are more or less a male preserve.**

**The point of** this paper is not to provoke a polemical debate on the power relationships between men and women but simply to discuss vulnerability and resilience to the potential impacts of climate change, and place women among these vulnerable groups. Women's roles are complementary to men's and their ability to uphold the social cohesion of the family is far too important to be restricted to a gender power play scenario. Climate change analysis has so far been science-driven, presented in terms of greenhouse gases and emissions. While the scientific analyses remain crucial, social imperatives must be taken into account. Although there are no obvious direct linkages between climate change and women, its potential impacts in terms of socio-economic vulnerability and adaptation place women in a key position. The fact that there are few trained women environmentalists may accentuate the gender deficit in environmental, and particularly climate, policy.

## 1. Introduction

**The notion of** gendered impacts of climate change may be perceived by cynics as yet another attempt at academic babble; a systematic attempt at gender mainstreaming in key development policies. After all, climate change is a phenomenon of our times that may alter the lives of humankind in general. Just as hurricanes, storms and floods strike indiscriminately, so too will the consequences of climate change. So, what gender differences could be expected?

**This paper focuses** on the human dimensions of climate change and looks at potential impacts of global warming on vulnerable groups, particularly on women. It places women at the centre of environmental stress and the ultimate climate change impacts. The topic of gender and climate change is new, and so many of the findings are theoretical rather than empirical.

## 2. Dynamics of Climate Change, impacts, vulnerability, resilience and adaptation

**The release of** greenhouse gases through human activities is creating a thick blanket in the atmosphere. Carbon dioxide resulting from the burning of fossil fuel is the largest single source of greenhouse gas emissions. Concentrations of this and other greenhouse gases (GHGs) will continue to increase global warming. Physical impacts such as rising sea levels will dramatically alter the natural balance of local and global ecosystems, flooding low-lying delta areas, increasing

salt-water intrusion, and intruding into human settlements. From a human security perspective, poor and vulnerable people will be most affected by climate change.

### 2.1 Socio-economic vulnerability – economic sectors and women as primary victims

#### • Fishing industry

**The problem of** rising sea levels is crucial, especially in terms of small islands and low-lying areas. These areas are inhabited by a significant percentage of the human population whose main sustenance comes from their natural habitat. Water contamination of ground water by seawater would also occur in low-lying deltas. In Senegal, fishing largely depends on the circulation of ocean waters, which will be profoundly affected by climate change. This could reduce the fish resource and cause seasonal fish such as *thiof* to disappear entirely. Women involved directly or indirectly (as fish traders) will see their income fall significantly. Considering the importance of the fishing industry to the Senegalese economy, climate change impacts could give rise to job losses and an increase in the price of fish leading to social upheaval. Natural catastrophes such as floods and storms could result in severe infrastructural damage on the coast and lead to population displacement. In their quest for remunerative activities, women may be unable to adapt to the vagaries of the weather and their remunerative activities could be severely disrupted.

#### • Agriculture

**For many developing** countries, agriculture, tourism and the agro-industry are the economic mainstays. Coastal systems already subjected to much stress as a result of population pressure would be increasingly affected by sea-level rise. Equally, environmental constraints such as desertification, climate change, loss of bio-diversity and their inherent ramifications could worsen the lives of millions of people in developing regions and increase their vulnerability. Many women in the Sahel are responsible for the cultivation and production of agricultural crops (68% of the population active in agriculture are women). It is estimated that 59% of the world's food production - 80% in some parts of Africa - rests squarely on the shoulders of women. Already, women have to contend with environmental stress such as cultivating arid land, especially in a drought-stricken Sahel. Climate change will exacerbate the situation.

#### • Food insecurity

**Land degradation could** well bring about economic and food insecurity. If climate change may worsen agricultural production and, consequently, exacerbate food insecurity, then it should be considered as a threat to food and human security in general. Women who are centre stage in the food chain, in production and in distribution, could see their basic human rights eroded. In other words, food security cannot be divorced from basic fundamental human rights of which access to education, employment and health services should be considered a part.

## 2.2 Socio-economic implications of environmental degradation at local and global levels

The problems relating to managing the environmental common assets will become worse with global warming. Food and water insecurity, is already a major threat to many people in the developing world, and the situation is set to worsen with climate change.

According to the IPCC (1990), climate change may heighten the problem of human migration. Worldwide, 150 million people will become homeless due to coastal flooding, agricultural disruption and shoreline erosion (Myers, 1992). Because women are key actors in maintaining the social cohesion of the family, this possible impact of environmental degradation could be very destabilising. Migration and environmental change could also trigger economic and social instability. Desertification is already taking a heavy toll on the activities of women and livestock, especially in the Sahel region. But, in addition, climate change is predicted to cause serious health problems related to cardiovascular, respiratory and other diseases. Heat waves due to warmer temperatures could see an increase in deaths although they could also arguably have the opposite effect (due to warmer temperatures in colder climates). Women and children may be exposed to greater water-related health risks since they are responsible for drawing water and have to contend with unhygienic and unsanitary conditions.

Today, environmental degradation is already affecting women's rights to sustainable livelihoods. Climate change is simply a much graver example of the complexity of environmental stress and how it could affect women. Women have a multi-dimensional role as mothers, providers, carers and often natural resource managers, many head the family. Climate change related hazards could mean a loss of revenue for women in agriculture, industry, fisheries and also in the informal sector.

### 3. Gendered dimensions of poverty

It is a widely held view that assisting women in their fight against poverty is essential for economic development. Climate change is predicated to accentuate the gaps between the world's rich and poor, and women are among the poorest and most disadvantaged.

Women constitute the majority of low-income earners. Perpetually imprisoned in cycles of dependency and co-dependent roles, women have to strive to maintain the household and its nutritional needs. Defining poverty is not easy, yet indicators such as per capita income, access to credit, ownership of assets, differential access to land rights, life expectancy, education, all put women in an unfavourable position in comparison to their male counterparts. In addition, because poor people and poor women specifically tend to have isolated lives, they find themselves marginalized and do not figure in poverty indicator analyses. Although women are not denied loans per se, increasingly high interest rates and demands for collateral mean that women are, a priori, excluded from taking advantage of credit or loan facilities.

### 4. Conclusion

Climate variability is already causing unpredictable damage and making already vulnerable people, including women, more vulnerable. Current socio-economic and cultural constraints affect women in a disproportionate manner. Women often develop adaptive strategies, yet the nature and scale of environmental stress is such that it may overwhelm women's ability to contribute effectively to socio-economic development. Women have a key role in development, and any potential environmental policy should take cognisance of women

as key players particularly given their role as natural resource managers. Measures need to be taken today to ensure that the effects of climate change do not further impoverish women and further plunge them into a poverty and dependency abyss. ■

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## Enda Tiers-Monde

### ENDA - Energy Programme

**ENDA TM – Environment** and Development in the Third World is an international organisation with diplomatic status based in Dakar, Senegal. The organisation is committed to the struggle against poverty, and it aims to work with grassroots groups based on their needs and objectives; contributing to the search for alternative development possibilities at all levels. Founded in 1972, ENDA is an association of autonomous entities co-ordinated by an Executive Secretariat. The organisation consists of teams and programmes working synergetically through a network of decentralised nodes worldwide.

**The objectives and** activities of the ENDA Energy Programme, carried out by one of ENDA TM's teams, are to contribute to a better technical, economic and socio-cultural understanding of energy problems. This includes the energy situation in African countries, energy information systems, energy planning, energy management, rational energy use, and energy policy. The aims are to contribute to the identification of the conditions needed for increased dissemination of the most efficient energy technologies among the most underprivileged groups; to analyse the relationships between energy, the environment and development; and the problem of climate change and its relationship to African development priorities (agriculture, forestry, energy); to help professionals in Africa master tools and instruments for analysing the energy and environmental problems of the continent; and to contribute to the strengthening of co-operation and dialogue between African countries and other Third World and Northern countries.

**In the ENDA Energy Programme,** emphasis is constantly placed on the interactions between certain key elements including research, action and training. Moreover, the programmes and work are generally undertaken in collaboration with other organisations. The ENDA Energy Programme is involved in work across the African continent. Depending on the nature of the work, it is undertaken at a regional, national or local level. ■

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# The Multifunctional Platform:



Nalini Burn

## Decentralised Energy for Gender-aware Poverty Reduction in Rural West Africa



Laurent Coche

**This article outlines the ongoing experience with a project concerned with decentralised mechanical and electrical energy supply.**

**The project, which** is supported by UNDP, is explicitly targeted at reducing poverty and achieving gender equality in villages in Mali and, through a regional project, other countries in Sub-Saharan Africa. Energy Platforms, that is to say small engines to which a variety of end use equipment can be attached (mills, alternators, oil presses etc), are promoted. The basic aims of the project are to reduce the time and energy poverty of women and to enhance the opportunities this creates for reducing income poverty and for achieving desirable outcomes in terms of other indicators of well-being and empowerment. The project, using its partners, can achieve these outcomes through the benefits of water pumping and water point provision, electric lighting and education.

**The intervention strategy** is to endow women's associations that request the Platform with the equipment, to build up their capacity to sustain ownership and control over time, and to develop the managerial and entrepreneurial competencies needed to enhance economic and technical viability. The entry point for vesting ownership and management in women is through concentrating on end-use characteristics, drawing attention to the traditional gender division of labour. The design and monitoring mechanisms explicitly focus on the recognised risk of male appropriation of technology and income generated from this technology.

**Further, this article** engages with the current thinking and debate about gender, poverty and energy linkages and interventions.<sup>1</sup> While the project focuses on the micro-level of the household and the village, its design, monitoring and evaluation use a conceptual, analytical and results-based management framework which links the micro to the meso and macro levels of development. This gender analysis framework also takes into account the link between the marketed, productive sector of the economy and the non-marketed, uncounted, productive, as well as reproductive, or domestic sector of the economy.

<sup>1</sup> It particularly focuses on the issues raised by the Briefing Paper prepared by Elizabeth Cecelski for a Brainstorming Meeting on Asia Alternative Policy and Project Development Support : Emphasis on Poverty Alleviation and Women, Asia Alternative Energy Unit, The World Bank, Washington D.C., 27 January 2000.



*The basic energy infrastructure of the Platform consists of an 8 hp or 10 hp (approx 7 kW) diesel engine (the Indian-made Lister engine, widely available in rural areas of Mali and Burkina Faso). (Photo: Multifunctional Platform, Mali)*

### How the platform addresses rural women's activities and specific energy needs.

**Smallholder agricultural or** livestock production, which occupies the overwhelming majority of the women, men, girls and boys of Sub-Saharan Africa, is characterised by a variety of gender and age-specific productive and reproductive tasks. These tasks, which make intensive use of energy and time to varying degrees, are subject to significant trade-offs in terms of income generation, time for inter-personal care and other capabilities and well-being enhancing uses of time. Many activities undertaken by women enhance the capacity of both men and women to engage in smallholder production and sustain social and cultural life on a daily basis. These form the primary target of the Platform for electrification and mechanisation.

**The Platform is** a technology which has been specifically designed to address the multiple uses of women's (as well as girls' and boys') time and energy in a variety of daily unpaid and uncounted productive/reproductive activities, most of which are gender-based obligations. Post-harvest food processing (grinding, dehulling, oil extraction), water extraction, transport and distribution are the most important of these. The Platform also caters for lighting needs and other end-uses of electricity that occupy women's, girls', boys' and men's time, including income generation, entertainment and leisure, social and cultural activities; and capability building, such as reading, writing and studying.

## The nature of the platform technology.

**The innovative aspect** of the Platform is that it combines energy supply with a variety of tools for different end uses. It consists of the basic energy infrastructure, in the form of an 8 hp or 10 hp (approx 7 kW) diesel engine (the Indian-made Lister engine, widely available in rural areas of Mali and Burkina Faso). The engine, which is mounted on a platform, can drive equipment also installed on this platform such as alternators for electricity generation for lighting, battery charging, welding, powering carpentry and joinery machinery. Mechanical equipment can also be connected such as grinding mills, hullers, oil presses, straw shredders. These end-use tools, given the gender division of labour in rural economies, can save women, as well as men, time and energy, and generate income.



*The Platform technology can be used to readdress the bottlenecks in the time and energy-intensive multi-tasking activities, such as post-harvest food processing (grinding, dehusking, oil extraction), in which rural women in Mali engage in are engaged. (Photo: Multifunctional Platform, Mali)*

**The platform is** thus multifunctional and flexible. Different pieces of dedicated equipment, for different end-uses, can be combined simultaneously and/or sequentially, for different uses and users. This is particularly appropriate for the time and energy-intensive multi-tasking that women engage in at particular times of the day, which can lead to bottlenecks in meal preparation, household maintenance, inter-personal services to husbands, the elderly and children before and after field work.

**For instance, the** engine can operate simultaneously, a water pump producing between 1-8 cubic metres per hour, a mill rated at 150 kg per hour, a battery charger, and still provide lighting (capacity of up to 135-180 25 watt bulbs). This engine is widely used elsewhere well below its capacity (for example for single use in private mills). However, simultaneous multifunctioning is not possible with welding, rice hulling and mechanical saws. The platform is an example of a decentralised energy supply combined with flexible mechanisation, which allows the possibility of economies of scope.<sup>2</sup>

## Decentralised energy supply: diesel or renewables?

**The average size** of a village in Mali is about 1000 inhabitants. There are some 7,000 such villages dispersed over a wide area, typically with poor communications and infrastructure. This is unfavourable for centralised grid electrification; and decentralised supply is the only viable option at present. The question is, which decentralised technology is best and are renewable energy options more desirable than fossil fuel based ones? The sustainable development discourse and practice which focus on the links between energy, natural resources, agriculture and poverty (and which now attempt to “factor in” gender) have tended to opt for renewable energy options. Before making such a choice in reality, however, it is important consider a wide range of issues and factors in the local context.

<sup>2</sup> Potential economies (costs of time, information, transaction, human and material resources [fuel, construction]) through a combination of a number of activities at one undertaking or establishment, even on a small scale, in contrast to economies made by undertaking one activity on a large scale.

**This issue is** best put into perspective from the vantage point of a village women’s association considering energy substitution. They have to balance their ability and willingness to pay for equipment to supply energy services, and for a variety of different end-uses, against the alternative: the supply of their own physical energy. If the different types of equipment (renewable and non-renewable) were offered under the same financial and institutional conditions, a platform run on diesel would be the most affordable and effective option, whatever the time perspective, when compared to solar and wind power, in the present context in Mali and other parts of the Sahel.

However, renewable equipment is often very heavily subsidised. Solar powered water pumps for instance are donated (a single end-use) with free provision of services and, in some cases, solar lighting systems have also been supplied entirely free of charge. However, it is a principle of the Platform project that the equipment be selected, at least partially, using market criteria.

**Its acquisition requires** financial outlays from the energy entrepreneurs (that is, the Women’s Association), who need to make an assessment of financial, economic and social viability based on market demand and supply conditions. The rationale for this, from the point of view of the project, is the sustainability of the technology transfer beyond the project life and the life of the equipment. It is for this reason that access to the energy services of the platform is market-based and fee-paying.

## The option of renewable feedstock for the platform: *pourghère* (*Jatropha curcas*).

**There is scope** for the platform to use renewable energy but this is not currently financially viable and may never be economically viable in many regions. The Indian-made Lister engine can run on vegetable oil as well as diesel. *Pourghère* is a shrub that grows in different parts of Africa. It is not eaten by goats and is often grown as hedges to protect vegetable plots against animal predators. It thus also has an anti-soil erosion value and acts as a wind break. Most interestingly, its seeds can be pressed using an oil press mounted on the platform, and the oil poured directly into the fuel tank of the platform. The remaining seedcake can be used as organic fertiliser.

**To the women** energy entrepreneurs, any competitive advantage of *pourghère* over diesel will depend on the relative price of diesel, the seasonal labour requirements for *pourghère* production compared to other gender-specific uses of time and energy, the level of income poverty and agro-climatic conditions. With the prevailing prices and energy policies, diesel is still the cheapest option. The potential multiple end-uses of the *pourghère* are under-exploited at present. However, the platform has the potential to be an engine of synergy, if the many end-uses of this vegetable fuel can be coordinated to increase the value-added by each activity.

## The financial conditions

**Currently the project** offers finances up to \$1500, which is around 20 to 30% of the cost of the basic platform, provided that the installation of the equipment is economically, socially and technically



viable. The basic platform includes the engine, an alternator (for the lighting of the building) and a mill, and is available on a demand-driven basis. The remaining financial outlay has to be mobilised by the village; clients pay for energy and end-use services.

**There are separate** financing facilities available for a mini-grid for lighting or a mini-water network if the community so requests. Around \$10,500, 90% of the total cost, can be provided, if the proposal is viable in the economic, social and technical senses. For instance, a minimum of some 100 bulbs are necessary, at current financial arrangements, for electric lighting to be viable at the rate of 1000 FCFA (about 1.30\$US) per month per bulb for 3 hours of lighting daily. This can mean that up to 100 households are needed in the network, depending on purchasing power and other commercial and institutional users.

## Ways of thinking: women, time and energy poverty

**The literature on** energy-poverty-gender, as well as the platforms of action for gender equality and women's empowerment, concentrate on widening access to energy. The access paradigm locks one into a pattern of thinking that perceives women primarily as users and consumers of energy. In actual practice, women *are* the source of energy, as the story in the box shows.

In 1998, in one village, Maurolo in Mali, a group of women told the evaluation team why they needed a platform.  
 "At this moment it is harvest time, we spend all our time until well after dark in the fields. Tonight the children will go to bed without food, and the men will go back to the fields without breakfast. You see, we do still have cereals in the granary, but we simply do not have time to grind and cook food. We are exhausted. Tomorrow, we will stay behind and find the energy to prepare lunch to take to the men and the other women in the fields. They won't be able to work as they need to on an empty stomach"

**Energy poverty is** usually conceived of as energy deprivation, as traditional sources of biomass energy become depleted. Energy poverty can better be seen as the inability to afford alternative sources of energy when one's own supply, or own provisioning is exhausted. This poverty exists because of an inability to command the energy and time of others using money or coercion (market or household provisioning) and to make more productive uses of one's own time. This adds another dimension to the issue of sustainability, that is, the sustainable use of women's labour.

**Moreover, it is** a gender-biased poverty since women

provide their energy and time to others for free as an obligation towards husband and family, so taken for granted that is considered natural. In contrast, motorised equipment is for the exclusive use of men, paid for out of agricultural income. Indeed macroeconomic models and accounting systems consider women's unpaid labour as valueless in the economic sense. Even when gender analysis is mainstreamed in project preparation, the economic analyses carried out in parallel fail to include what is arguably the largest sub-sector of transport and energy in sub-Saharan Africa: human traction, haulage and energy.

**Time and energy** poverty are both the causes and the consequences of income poverty, and the associated conditions in education, health, nutrition, and the lack of security, opportunity and empowerment. The real target for gender-aware poverty reduction and gender equality could thus be the disappearance of the human energy self-provisioning subsector, particularly for women. ■

◆ Nalini Burn holds a first degree in economics from the London School of Economics and a master's degree in development economics from the School of Oriental and African Studies, University of London. She has worked as a university lecturer for many years both in England and Mauritius and has been active in a number of women, as well as environment, NGOs in Mauritius. She now works as an international freelance consultant specialising in gender analysis, mainly for international agencies. She has been involved in the multifunctional platform project since 1997, developing participatory tools for design, monitoring and evaluation of the project as well as training of project staff and other partners.

◆ Laurent Coche graduated in international law and political sciences, and has a post graduate degree in development economics. Laurent is the regional coordinator of the Regional Cell for the promotion of the energy platform in Mali. The aim of the programme is to assist interested countries to adopt the platform in their own projects, initially as a pilot experience, to evaluate how efficient it is as a means of poverty alleviation.

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## ENTERPRISE INITIATIVE

### The Africa Rural Energy Enterprise Development Project (AREED)

The goals of AREED are to create rural energy enterprises and to build up the capacity of non-governmental organisations and financial institutions to facilitate their development. The AREED initiative seeks to create sustainable energy options for the rural poor of Africa by increasing the capacity of the private sector to offer energy services using clean, efficient, and renewable energy technologies. Using a proven method of coupling enterprise development services with modest amounts of start-up finance, the initiative will, in five African countries (Botswana, Ghana, Mali, Senegal and

Zambia), help seed new businesses that apply "best-practice" approaches to the supply of modern energy services that are affordable to the rural poor. In so doing, the AREED initiative endeavours to broaden the depth of organisations and people who have the capacity to nurture energy entrepreneurs. Specifically, the initiative will:

- assist a number of local entrepreneurs to establish rural energy service companies
- increase the capacity of regional NGOs to identify and support small and mid-size energy enterprises through their critical start-up phase, and
- assist regional financial institutions to assess and ultimately invest in this sector.

AREED is looking to work with NGOs, financial institutions and entrepreneurs in Botswana, Ghana, Mali, Senegal and Zambia. Since its launch in April 2000, AREED has identified a number of women entrepreneurs.

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# Resources: Book Review

## Rural Energy Matters: the Dhanawas Experience

Authors: Preeti Malhotra, Soma Dutta, R. C. Pal, Shishupal Sharma, P. Venkata Ramana

Published by: TERI, Tata Energy Research Institute, 2000

Review by: Njeri Wamukonya

**In 1984, Tata Energy Research Institute (TERI) became involved with Dhanawas, a village in northern India, to gain field experience in planning for the energy needs of a rural community and finding sustainable solutions to meet these needs.**

**Dhanawas, is a** fast growing village with strong linkages to the urban areas and is representative of a large number of villages that can be termed as peri-urban rather than rural. This book describes a comprehensive action – oriented research experience in the village over 15 years. Chapters 1 to 10 present characteristic details of the village, and the technologies that were introduced are depicted in four distinct phases.

**The first phase** focused on trying to understand the energy scenario in a rural setting through detailed surveys, informal discussions and rapport building. “In keeping with the energy usage pattern in rural India, the people of Dhanawas are primarily engaged in agriculture, the rural populace depend heavily on biomass for their energy needs, especially for those in the household sector” (page 48). Cooking is established as the major energy consuming end use in the village. This inception phase was followed by a period during which several technologies such as biogas plants, improved cook-stoves and biomass gasifiers were developed and field tested in the rural setting and later modified to suit the specific requirements of the villagers. Other types of technologies such as solar water heaters and solar cookers were also field tested but later dropped when found to be unsuitable for the village. The third phase of TERI’s work began with the acceptance of the technology

by the villagers. This brought with it the interplay between institutional issues and the need for capacity building of the villagers to plan, design and install renewable technology devices in line with their needs. The final phase was the gradual withdrawal of TERI’s presence from the village. This involved putting in place requisition systems that would ensure a smooth withdrawal, and the complete hand over of the management of the technologies to the villagers. In chapters 11 through to 13, the book provides a critical analysis of TERI’s experience in Dhanawas, the lessons learnt and directions for future energy policies and programmes.

**This book provides** an excellent insight into the problems faced by energy researchers and energy-focused development workers in rural areas, particularly in Dhanawas but also very relevant to other developing countries and areas. It is a great reference for those working in these fields or intending to. For those aiming to raise awareness of the complexities of working in rural areas to donors, government planners, policy makers and other organisations, especially on the dire need for long term planning and projects, it will be a valuable asset. TERI has presented their experiences in a forthright but also critical manner that acknowledges their own mistakes.

**This book provides an excellent insight into the problems faced by energy researchers and energy-focused development workers in rural areas, particularly in Dhanawas but also very relevant to other developing countries and areas.**

**After reading the** book I couldn’t help but wonder whether anyone could really claim ignorance of some of the issues discussed as reasons for failure. One also can’t help wondering if energy is an important development issue at all, whether people do not have coping mechanisms which enable them to focus on other more important issues.

**Some of the** important findings are:

1. Energy is not a priority issue in rural

areas. This finding is important as it confirms the necessity of an integrated development approach where energy becomes part of a package, or rather ‘piggy-backs’, on other activities. This lesson could be valuable for various projects. These include: a rural SEED project being undertaken by EDRC; energy surveys in Botswana with the aim of introducing intervention measures to reduce fuelwood use to a sustainable level, by EDRC and RIIC (Botswana); assessment of energy needs that are replaceable with solar, by BOTEC (Botswana); the GTZ solar cooker project in South Africa (it may be quite useful to compare experiences here!).

2. Benefits that will accrue to communities should be made quite clear prior to commencement of projects/programmes to prevent disappointments which could lead to withdrawal and hence project failure.
3. Importance of listening/understanding community needs and not pushing own technologies and own agenda. This was evident from the introduction of TARA chulhas and solar cooling systems. Only technologies that fill a gap should be introduced. Improved stoves should only be introduced in areas where the communities perceive that they are facing fuelwood scarcity (this lesson has

also been noted in the work by Kirk Smith “why improved stoves fail”).

4. An emphasis on targets compromises quality, the importance of meeting user requirements and the sustenance of projects. If the project’s rate of delivery becomes the main focus, activities such as awareness raising and training are neglected. (a good lesson for the solar electrification projects unfolding in South Africa).
5. The importance of long term monitoring

for identifying problems and enabling modification.

6. Technologies need to be piloted over extended periods in the field before they can be disseminated.
7. Initiatives need to have policy forums, as these are critical if the lessons learned are to be of national importance or to be sustainable. The initiatives undertaken by TERI did not have such a forum despite the fact that the government was involved in similar activities elsewhere and cross-pollination could have easily occurred. Researchers should seek and maintain the ear of policy makers. Development workers are obliged to market their work if it is to have impacts beyond selected areas.
8. Development workers/researchers should be trained to address common community problems including dispute resolution. Energy issues cannot be handled in isolation. People will not invest in, or take an interest in, energy if they have other more pressing issues.
9. Communities are rarely homogenous and hence long preparatory periods in a community are necessary to understand its dynamics before embarking on a project. Community politics should be expected to influence projects and hence due attention should be given to understanding the political situation. Rapport building is crucial and communities need to be seduced into projects.
10. Withdrawal plans should be designed from the outset to avoid untenable situations being perpetuated.
11. Environmental benefits will not sell a technology as they accrue only in the long term. Tangible benefits have to be demonstrated.
12. Subsidies: how long and how much? This remains a difficult issue, but it is not confined to renewables, grid electrification is subsidised. However, it is important to establish how long is long enough, and then withdraw when an initiative has failed.

## Gender issues

**Were gender issues** addressed? It appears that, from the outset of the project, gender was certainly not in the equation. When some issues arose, such as the training of women to make chulhas, the total environment in which the women operated was not adequately taken into account, rather the fact that these would be a new source of income for women seems to have been the major driver. The ability of women to make decisions relating to cooking and other energy needs seems not to have been investigated in depth. The ability of women to spend earnings from the chulha business was not discussed. It is also

not very clear why women could not construct the chulhas in other people's houses. Was there a category of women who might have been able to do so? Could men have done this and, if so, why were they not targeted after the approach using women failed? Were there any women's or men's groups in the village? If there were, it is not clear the extent to which they were used in the project.

### Some notes:

- Training included women although it did not address the cultural barriers preventing women from constructing stoves in other households.
- The term 'manpower' is used a lot even when discussing women's labour.
- It does not address the disparities in increased workload between women and men resulting from biogas plants, but rather reports aggregated information.
- TERI sought to represent women's interests by having women on a committee.
- It is evident that having a woman on a committee does not necessarily translate to a representation of women's interests. Socio-cultural barriers prevented the woman voicing her concerns. Would having more than one woman have made a difference?
- The cultural barriers preventing women from communicating among and with their own men folk does not seem to extend to other men, and seems also to be dependent on the status and affiliation of the men. Women were able to communicate freely with TERI workers – some of whom were men from their own communities.
- Women are seen as consumers and promoters of the technologies but are not involved in design or project planning.
- The work does not seem to have comprehensively addressed the role of women in the household and the community.

## Relevance for Africa

**There are many** parallels with rural Africa as I have noted in some of the points above.

**For the future** of solar technologies, the need for the training of locals to ensure accessible service is noted. Such an approach was adopted and implemented in Namibia - however the people trained then tended to move, leaving the areas uncatered for. Perhaps the training should be given to elderly people whose level of mobility is lower-but is this really sensible? The working loan, as proposed for the technician trainees in Dhanawas, has been offered to solar technicians in Namibia. While such a loan can be useful in setting

up the business, such a business is still only sustainable where there is a critical mass of consumers of the technology in a given area. TERI has also recommended 'the cluster approach'. Such an approach is however only feasible where the income levels are fairly high and similar across households.

**As would be** expected from any comprehensive and informative piece of work, such as this book, there are always some questions that a reader would like to ask the author. I would have liked some more details on TERI's withdrawal plans, financial arrangements for the various technologies (e.g. what were the experiences with repayments?), some technical aspects of the technologies, the dynamics of operations and maintenance (e.g. were there gender disparities?), impacts of training on women etc. ■



◆ The reviewer, Njeri Wamukonya, until recently worked as a researcher on energy and climate change policy, at the Energy and Development Research Centre

in Cape Town. She will be joining the UNEP Collaborating Center on Energy and Environment, at Risø National Laboratory, Roskilde Denmark, as of 1st September 2000

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◆ If you wish to obtain a copy of the book "Rural energy matters: the Dhanawas experience", please send your requests to: **TERI Information Dissemination Services, Darbari Seth Block, Habitat Place, Lodhi Road, New Delhi – 110 003, India; Tel: +91(0).11.460.1550/462.2246, Fax: +91(0)11.462.1770 or 463.2609 E-mail: mailbox@teri.res.in, Website: http://www.teriin.org**

## Correction:

In the last issue of **ENERGIA News** 3.2, the title of the book "Rural energy matters: the Dhanawas experience" was wrongly given as "Renewable Energy in India" in the "The Bulletin Board" section on page 15. The **ENERGIA News** editorial team wishes to apologise for this mistake.

# Resources: Book Review

## Energy Efficiency For Small and Medium Scale Enterprises

Authors: Elizabeth Muguti, Saskia Everts, Bob Schulte, and Linda Smallegange

Published by: Intermediate Technology Publications in association with UNIFEM, 1999

Review by: Hespina Rukato

### The aim

The book is aimed at providing the necessary information for helping women to make technological choices and seek further technical assistance to increase the efficiency of their enterprises. Women can benefit from energy savings and increased profits, with energy savings through the use of cleaner technologies, and contribute to sustainable development by using less fuel. The book aims to highlight the benefits of increased energy efficiency and increased enterprise profitability, and how women in particular can take advantage of this energy efficiency-economic viability balance.

### The target group

The book is targeted at fieldworkers and policy makers who work with women in small and medium scale enterprises. The book offers advice on enterprise operational improvements through energy savings and improved energy efficiency, in other words: *making quality products at the least possible energy costs while maintaining economic efficiency.*

### Chapter 1: The importance of energy efficiency programmes

This chapter analyses the role of small and medium enterprises in income and employment creation as well as the part women play in the majority of these SMEs amidst a wide range of difficulties. The many reasons for the high-energy consumption per unit of production in small enterprises are explored, including the externalities of low-cost, subsidised and/or "free" energy.

Energy is highlighted as the most important input into any business venture and, as such, its efficient use can determine the viability of a business. The potential benefits of applying an Energy Efficiency (EE) programme to small business ventures are analysed in this chapter, as well as the resultant benefits which range from financial and health to environmental and social. The difficulties of initiating an EE programme are explored, and a "cold

storage" case study from India is used to demonstrate the importance of EE training in the success of small female-headed enterprises.

### Chapter 2: Analysis of the existing situation (step 1)

Chapter 2 explores the first of the three steps that the book offers in a step-by-step demonstration of how to initiate an EE programme.

An energy audit or analysis is considered to be the most critical step in reducing energy losses. Carrying out an energy audit requires looking into the nature of a business; exploring opportunities for increased production, and deciding whether or not a business is worth further or increased investment. The authors make good use of exercises, demonstration tables and examples that can assist readers in reaching conclusions and making energy decisions about their own enterprises.

### Chapter 3: Identifying immediate energy saving potentials (step 2)

Chapter 3 advances from step 1 in chapter 2 by demonstrating how the information gathered in the energy audit or analysis can be used to identify areas of potential energy savings. Suggested ways of cutting energy consumption include behavioural, technological, and investment changes. The most common and "easily detectable signs and causes of" energy losses" are listed, as well as ten simple actions that can save energy in small enterprises. Three case studies demonstrate how simple changes can lead to significant energy savings.

### Chapter 4: Technology options for energy savings

Chapter 4 offers a comprehensive description of various energy technology options that are available to small and medium enterprises owners. The authors note that while some of these technologies may be out of the reach of many small

business enterprises, it is nevertheless important for entrepreneurs to know what options are available so that they can decide on the suitability of these technologies for their own enterprises. The chapter is divided into six sections that deal with electricity use; energy efficient technologies and energy efficient methods; energy efficient stoves and biomass use; and the use of waste heat from one process as a heat input into another process. The fifth section explores the potential of wind and solar energy, and the investments required, as well as the potential benefits to be derived from their use. Detailed figures and case studies are used to demonstrate the types of technology, and the way the technologies work.

### Chapter 5: Choosing the best option

This chapter should, in my view, have been placed before chapter 4 since it flows directly from chapter 3. The most important factors that need to be considered in making effective technological choices are analysed. These technological choices have to be made from the array of technologies described in chapter 4. The factors include potential energy savings, financial factors, the production system in use, the technology in use, the market implications of changing technologies, as well as environmental and social factors. The chapter offers a comprehensive checklist that can be used by readers as a guide when making technological decisions and choices.

### Chapter 6: Implementation (step 4), monitoring (step 5) and evaluation (step 6)

The final chapter of the book effectively comprises steps four, five and six. These steps pull together the various steps, guidelines and options that were discussed in the preceding chapters. Once readers have made their technological choices, and decided to implement an EE programme, the next step is the implementation of the programme, followed by its monitoring and evaluation.

## Implementation

**Implementation is the** fourth step that calls for an action plan. The action plan should consist of clear and achievable objectives, specific activities to be undertaken, and the expected results. A budget is highlighted as a critical aspect of the implementation plan, as well as the allocation of tasks and responsibilities, and the timeframe and time schedule of activities. The content of an implementation plan has been described in detail, and the importance and role of external expertise and advice have been highlighted.

## Monitoring

**Monitoring is intended** to give an insight into the effectiveness of an EE programme. It should give an entrepreneur an idea of where the programme has failed, and where it has been successful. The various monitoring steps are listed in this section.

## Evaluation

**The final step** should be an evaluation of how an EE programme has been implemented, whether or not there are any deviations from the original action plan, and if these deviations can be brought back on track. The evaluation should highlight

the achievements and constraints of the EE programme up to the time of evaluation. Critical aspects that need to be considered in an evaluation are listed in this section, as well as advice on scheduling EE programme evaluations.

## Overall impressions

**The book is** a long overdue resource book, not just for policymakers and field workers, but for all those who are involved in any form of energy use, right down to the household level. The book clearly addresses the information gaps that exist as far as women entrepreneurs are concerned. While the book meets the needs of the target groups, its distribution should be widened to cover educational institutions including schools and higher institutes of learning such as technical colleges. The book could also be used by institutions and enterprises that want to cut their energy costs. There is a potential for a wide application of the comprehensive options and advice that the authors of this book offer.

**Readers are provided** with a basic understanding of the various energy technologies, how they work, the benefits to be derived from their use, as well as the financial implications of their use. The authors make use of tables, examples and exercises that will assist readers in

understanding the economic implications of various energy technology options on their business operations. Wide-ranging case studies from Asia, Africa and Latin America will help readers in grounding the various issues in contexts that have an immediate resonance. The authors have also provided checklists that will assist readers in making effective energy technology decisions.

**It is clear** that a lot of thought, expertise and diverse experiences have been put together to come up with this very elaborate guide to EE programmes for small and medium enterprises. While the authors pre-suppose access to the energy sources that would make many of the energy technologies a reality, the book remains a must for all who wish to make a difference in the energy sector, both from an individual and an institutional point of view. ■

◆ For more information on the reviewer, please refer to Meeting *ENERGIA* Members.

◆ If you wish to obtain a copy of the book, please send your requests to:  
**Intermediate Technology Publications Ltd., 103-105 Southampton Row, London WC1B 4HH, UK;**  
**Tel: +44.(0)20.7436.9761,**  
**Fax: +44.(0)20.7436.2013,**  
**E-mail: orders@itpubs.org.uk**

# Internet Resources



**Regional Wood Energy Development Programme in Asia:** There have been recent developments on the website of the Regional Wood Energy Development Programme in Asia <http://www.rwdep.org>. Three publications have been added to the site. RWEDP report no.44 at: <http://www.rwdep.org/rm44.html> contains the findings of a study tour in India on the topic of wood energy planning. RWEDP report no.45 at: <http://www.rwdep.org/rm45.html> focuses on the production, utilisation and marketing of fuelwood in Lao PDR. RWEDP report no.46 at: <http://www.rwdep.org/rm46.html> considers the linkages between wood energy, women, and health; and contains the findings of a sub-regional training course. All of these publications may be downloaded. You may check the 'What's New' page at: <http://www.rwdep.org/whatsnew.html> for the latest additions to the site. Any

questions regarding these additions, or other questions related to the site, may be e-mailed to: [webmaster@rwdep.org](mailto:webmaster@rwdep.org)

**Synergies:** it is worth taking a look at this (French language) newsletter of the CARE Haiti Energy Project, which may be downloaded from: <http://www.olade.org/cc/haiti/synergie/index.html>. The latest edition includes an interesting article on fuel, money and CO<sub>2</sub> savings for a range of improved cookers in use in Haiti. This information has been passed on by HEDON member Grant Ballard-Tremeer

**Solstice:** is the Internet information service of the Renewable Energy Policy Project and the Centre for Renewable Energy and Sustainable Technology (REPP-CREST). The site provides information on renewable energy, energy efficiency, and sustainable development; and offers services such as professional website hosting and design, mailing lists, database publishing, and online commerce. Solstice is also the home of websites for more than 50 other renewable energy organisations. Visit the website at: <http://solstice.crest.org/index.shtml>.  
**Energyinfo.net:** some energy literature is posted at: This is a trial arrangement by

Elsevier Publishers and includes articles from previous energy related journals. At the moment it is free, so take a look while you have the chance. This information has been provided by Wim Klunne, a HEDON member.

**The following reports can now be downloaded from:**  
<http://www.epa.gov/crb/apb/publications.htm>  
Smith KR, Uma R, Kishore VVN, Lata K, Joshi V, Zhang J, Rasmussen RA, and Khalil MAK, (2000) *Greenhouse Gases from Small-scale Combustion Devices in Developing Countries, Phase IIa: Household Stoves in India*. EPA-600/R-00-052, U.S. Environmental Protection Agency, Office of Research and Development, Washington, D.C., June.  
Smith KR, Pennise DM, Khummongkol P, Chaiwong V, Ritgeen K, Zhang J, Panyathanya W, Rasmussen RA, Khalil MAK, and Thorneloe SA (1999) *Greenhouse Gases from Small-scale Combustion Devices in Developing Countries. Phase III: Charcoal-Making Kilns in Thailand*. EPA-600/R-99-109, U.S. Environmental Protection Agency, Office of Research and Development, Washington, D.C., December.

# Resources: Focus on Training

## Addressing Gender Needs in the Energy Sector: Capacity Building in Africa

22

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Despite the long standing recognition that women have special energy needs, policies to meet these needs are developing only slowly in Africa.

**Why? Recent workshops** in the region (see the article by Lydia Karanja and under in this issue) identified the cause as male domination of the energy sector, leading to a lack of gender sensitivity in energy policies, planning processes, and projects. How can we change this? Both workshops identified education and training as the mechanism to increase women's participation in energy planning and projects. In addition, more effective lobbying and advocacy with policy makers is needed. Overall, women's capabilities have to be built so that they can begin to shape their own choices within the energy sector. These capabilities need to range from grass-roots women's capacity to articulate their own needs and interests to increasing the number of professional women working in the energy sector. There is also a need to consider the role that training can play in enabling male energy policy makers and planners to take a more gender-sensitive approach.

**Building women's capacity** in the energy sector through training is one of ENERGIAs objectives, and it is a priority activity within the Second Phase. As a follow-up to the Nairobi workshop, ENERGIAs wishes to support the development of a capacity building programme within the energy sector in Africa. This programme would contribute to the development of a critical mass of women and men leaders to change the policies, programmes and practices that affect women and energy. ENERGIAs firmly believes that the women of Africa should define their priority needs for capacity building. Currently there is a consultation process to identify what sort of training is needed and for whom. We are also trying to ascertain what gender training has already taken place in the energy sector and which African institutions have carried out such training or have the capacity needed. This will help identify potential partner institutions for implementing a capacity building programme. To assist us in this task we have a Technical Advisory Group (TAG) consisting of women and men active in the energy sector, from Anglophone and Francophone Africa, who represent NGOs,

the private sector and government. The process is conducted via email using a virtual conferencing technique which proved very successful in the lead up to the Nairobi workshop. The TAG members are sent questions and should respond by a given date. The replies are synthesised and returned to the Group for comment with follow-up questions. In this way, a consensus is developed.

**The consultation process** should be completed by the end of 2000, after which ENERGIAs aims to develop a proposal for a capacity building programme. A future edition of ENERGIAs News will report on the outcome of the TAG consultation and the proposal. ■

◆ We would be delighted to hear from anyone else in Africa who has views on this topic. Please contact:

**Joy Clancy, Technology and Development Group, University of Twente, P.O. Box 217, 7500 AE Enschede, The Netherlands;**  
**Tel: +31.(0)53.4893537 or 4893545,**  
**Fax: +31.(0)53.4893087,**  
**Email: j.s.clancy@tdg.utwente.nl or the ENERGIAs Secretariat**

### VACANCIES

#### Position at the Environmental Sociology Faculty

The Energy and Resources Group (ERG) at the University of California, Berkeley seeks someone with a Ph.D. in sociology, anthropology, geography or related discipline whose emphasis is on the social dimensions of energy, resources and/or the environment to fill a junior faculty, tenure track, position starting in 2001-02. The ERG runs a graduate programme and comprises natural and social scientists engaged in a multidisciplinary programme of research, education, and public service on the social, economic, technical, and scientific dimensions of energy, resources,

and the environment. The appointee will keep abreast of a broad range of social developments related to the programme, undertake specific research (for example, on resource extraction conflicts, social movements, environmental justice), and seek an integrative perspective. Field research experience and the ability to teach field methods are critical. In addition to the course on research methods, the appointee will provide additional courses complementing her or his research interests, be encouraged to co-teach with faculty staff in the natural sciences or engineering, and oversee graduate seminars and student-initiated reading groups. The nature of the position and the qualities of the individual

selected should lead to substantial public and professional service. A curriculum vitae, a letter articulating the scope of the applicants interest in, and qualifications for, this position, and a dossier including three letters of recommendation, should be sent to: Chair of the Social Science Search Committee, Energy and Resources Group, MC #3050, University of California at Berkeley, Berkeley, California 94720-3050, USA.

The deadline for receipt is October 15, 2000. The University of California is an Equal Opportunity Affirmative Action Employer.

## CONFERENCE INFORMATION

### The sixth session of the UN World Conference on Climate Change

From 13 to 24 November 2000, the Netherlands will host the 6<sup>th</sup> session of the UN World Conference on Climate Change (COP 6). The Hague conference will be the most important session since the Kyoto Protocol was adopted in 1997. It is expected to bring to a conclusion the Buenos Aires Plan of Action, an ambitious programme of work that was agreed at COP 4 in Buenos Aires in November 1998, and thereby set the stage for the Protocol to enter into force. The session is expected to especially focus on flexible mechanisms to reduce carbon dioxide levels. All the parties under the Framework will meet in The Hague. Government ministers, diplomats, bureaucrats, industrialists, international organisations, scientists, consultants and NGOs will participate in the conference.

◆ For more information on COP 6, visit the web site at: <http://www.unfccc.org>

### International conference on Solar Cooking

From 27-29 November 2000, under the patronage of the South African Department of Minerals and Energy, an International Conference on Solar Cooking will take place at Kimberly in the Northern Cape Province. Besides solar energy, issues concerning other renewable sources of thermal energy will be included. Of particular interest to *ENERGIA* members will be the plenary session on 27 November on "Barriers to the utilization of Renewable Energy for Solar Thermal Application". During this session, issues of Social Acceptability and Gender will be discussed. A wide range of international organisations and individuals are expected to participate.

◆ For more information, please contact:  
**Ms N Lisa Director, Department of Minerals and Energy, Private bag X59, Pretoria X59, South Africa;**  
**Tel: +27.(0)12.317.9107/9213,**  
**Fax: +27.(0)12.322.5224,**  
**E-mail: [lisa@mepta.pwv.gov.za](mailto:lisa@mepta.pwv.gov.za)**

**Seminar on Rural Energy Provisions in Africa (SEREPRO) 9-11 October 2000,** United Nations Gigri Headquarters, Nairobi, Kenya. This ISES Utility Initiative for Africa project is aimed at fostering the sustainable development of rural energy provision on the African continent, from policy through to the

implementation of projects. This is achieved by motivating African governments and utilities to form Renewable Energy Enterprise Zones (REEZ) where individual energy concepts can be developed for each area linked to their most urgent needs. In each zone the tailor-made energy concept should be implemented using state-of-art technologies, as well as an appropriate training and maintenance strategy.

◆ For more information, visit the web site at: <http://www.ses.org>

### Village Power 2000

From the 4-7 December 2000, the National Renewable Energy Laboratory (NREL), the World Bank, the UNDP World Bank Energy Sector Management Assistance Programme, the US Agency for International Development (USAID), and Winrock International will host the Village Power 2000 Conference in Washington DC. The theme of the conference is "Empowering people and transforming markets". Representatives from governments, the private sector, non-governmental organisations, and financial institutions worldwide are expected to attend.

◆ For more information, please contact:  
**Barbara Ferris, 1617 Cole Blvd., Golden, CO 80401 USA; Tel: 303-275-3781,**  
**Fax: 303-275-4320,**  
**E-mail: [barbara\\_ferris@nrel.gov](mailto:barbara_ferris@nrel.gov) or visit the web site at:**  
**<http://www.rsvp.nrel.gov/vpconference/vpconference.html>**

## PUBLICATIONS

### Electricity in Households and Micro-enterprises: Energy and Environment Technology Source Book

*By Joy Clancy and Lucy Redeby*

This source book aims to provide practical help in gaining accessibility to electricity for those living in remote or rural communities as well as individual homeowners and small businesses. The book is intended to provide resource material appropriate for use by extension workers, trainers and project staff working with women, who consider that access to electricity can play a significant role in their projects. Women's groups active in promoting women's enterprises and education could also use it for self study or discussion.

◆ For more information and orders, please contact:

**Intermediate Technology Publications Ltd., 103-105 Southampton Row, London WC1B 4HH, UK;**  
**Tel: +44.(0)20.7436.9761,**  
**Fax: +44.(0)20.7436.2013,**  
**E-mail: [orders@itpubs.org.uk](mailto:orders@itpubs.org.uk)**

### Appropriate Household Energy Technology Development – Training Manual

*By Lydia Muchiri and Mya Sengendo*

Based on lessons learnt whilst working with East African partners in energy-related activities, this guide provides a series of practical tools for training those involved in community development, particularly sustainable energy activities, as well as for harmonising the training methods provided by various organisations and individuals.

◆ For more information and orders, please contact:

**Intermediate Technology Publications Ltd., 103-105 Southampton Row, London WC1B 4HH, UK;**  
**Tel: +44.(0)20.7436.9761,**  
**Fax: +44.(0)20.7436.2013,**  
**E-mail: [orders@itpubs.org.uk](mailto:orders@itpubs.org.uk)**

### The Role of Women in Sustainable Energy Development

*By Elizabeth Cecelski*

This study explores the question of how sustainable energy development – specifically, decentralised renewable energy technologies – can complement and benefit from the goal of increasing women's role in development. It is based on a paper originally presented, at the fifth World Renewable Energy Congress held in Florence, Italy, in September 1998, as a contribution to the National Renewable Energy Laboratory's (NREL) programme on gender and energy.

◆ The study is available electronically at:

**<http://www.doe.gov/bridge>**  
A paper copy of the study can be purchased from: **U.S Department of Commerce, National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161 USA; Tel: +1.(0)800.533.6847,**  
**Fax: +1.(0)703.605.6900,**  
**E-mail: [orders@ntis.fedworld.gov](mailto:orders@ntis.fedworld.gov), online ordering:**  
**<http://www.ntis.gov/ordering.htm>**

# Next Issue

The next **ENERGIA News** (vol. 3.4) will be devoted to the "World Renewable Energy Congress – Energy and Gender Workshop" that was held on the 6<sup>th</sup> November 2000, in Brighton, England.

**ENERGIA News** plans to publish the *ENERGIA* directory of the names and contact addresses (postal address, telephone and fax numbers, email and web site addresses) of all subscribers. The directory will also be posted on the *ENERGIA* web page. If for privacy reasons you do not want any part of your address published or posted, please write and let us know. We kindly urge you to fill in the Data Sheet enclosed with the last issue, which will also help us to update our records. When completed please send it to the **ENERGIA News** Secretariat.

*ENERGIA* is an international network on Women and Sustainable Energy, founded in 1995 by a group of women involved in gender and energy work in developing countries. *ENERGIA's* objective is to "engender" energy and "empower" women, through the promotion of information exchange, training, research, advocacy and action aimed at strengthening the role of women in sustainable energy development. *ENERGIA's* approach is to seek to identify needed activities and actions through its membership, and then to encourage, and if possible assist, members and their institutions to undertake decentralised initiatives. **ENERGIA News** is the principle vehicle for this approach.

**ENERGIA News** is produced jointly by Energy, Environment and Development (EED, Kurten, Germany), the Technology and Development Group (TDG, Enschede, the Netherlands) and ETC Energy (Leusden, the Netherlands) which houses the secretariat. The focus is on practice, with a conscious effort to *interpret* and *learn* from this practice.

Subscribing to **ENERGIA News** is free of charge but we do ask in exchange that our subscribers contribute to the newsletter by sending in their own articles, letters, publications, reports, notes, resources, announcements, photographs, news and events. To become a subscriber to **ENERGIA News** or with any query please contact:

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## Themes for future **ENERGIA News**

WREC - Energy and Gender Workshop Issue: Volume 3>Issue 4>  
Deadline for submissions: 6<sup>th</sup> November 2000

Southeast Asia Issue: Volume 4>Issue 1>March 2001  
Deadline for submissions: 4<sup>th</sup> February 2001

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