

REPORT ON REGIONAL WORKSHOP FOR SOUTHERN AFRICA

Held June 21 and 22 in Pretoria, South Africa

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1.0 Background

As one component of the project entitled "Energy and Women: Generating Opportunities for Development," UNDP's Energy and Atmosphere office organised a regional meeting on women and sustainable energy for 10 countries in southern Africa, in collaboration with the UNDP Country Office in South Africa and the Minerals and Energy Policy Centre, a local non-government organisation. Country representatives were invited from Angola, Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe.

The purposes of the regional workshop were:

- (a) to gather and share information about the relationship between women and sustainable energy policies, including constraints affecting women's energy choices;
- (b) to support and build on existing energy networks; and
- (c) to discuss new approaches and potential pilot activities in support of women's access to sustainable energy services for productive purposes.

Although the Energy and Women project is not by itself intended to provide funding for new pilot projects, it is expected to provide technical assistance in designing new proposals and approaches regarding women's access to sustainable energy resources,

particularly for use in income-generating activities. The Energy and Women project will also undertake analytic studies on lessons learned from past energy projects, and on the role of micro-credit schemes in funding user acquisition of new energy technologies. Financial support for the Energy and Women project has been provided by the Swedish International Development Cooperation Agency (SIDA) and UNDP's Sustainable Energy Global Programme.

In many developing countries, particularly in rural areas, women are the primary users and providers of energy for household and informal productive uses. Often they are dependent on wood, dung and biomass residues for use as fuels because electricity and other energy resources are unavailable or unaffordable. Access to more efficient and environmentally sustainable energy services can provide women with more time and opportunities for income-generating work, and can also improve their overall health and living conditions, as well as the development situations of their families and communities. The geographical focus of the Energy and Women project is on Africa, where large numbers of people lack modern energy services, and where there is great potential for utilising renewable energy resources.

This workshop was the first of three planned in southern, western and eastern Africa during the next two years. In preparation for the regional workshop each country was asked to prepare a national report for presentation, preferably based on a national consultation or other participatory process involving stakeholders concerned with women and energy policies. The Energy and Women project offered financial support for these national consultations.

As this was the first regional workshop, it provided an opportunity for getting national-level reactions to the Energy and Women project objectives, and for gathering ideas about how UNDP and other development partners can provide more effective support for national actions regarding women and sustainable energy. The Energy and Atmosphere office expects to work with the country representatives attending the regional workshop in order to identify and support specific follow-up activities.

In addition to a draft agenda for the regional workshop, participants were provided with a briefing paper describing the Energy and Women project and a paper outlining draft criteria for selection of case studies on lessons learned from prior projects. Participants also received copies of all the country reports.

2.0 Workshop Participants

There was a lot of interest in the topic of women and sustainable energy, and very good attendance. All the countries invited sent well-informed representatives to participate and to present reports on energy conditions in their countries. In most cases, there was one person from a non-governmental organisation or university and one person from a government ministry, whose attendance was supported by Energy and Women project funds. A list of all the workshop participants is attached as Appendix 1.

The Swedish International Development Cooperation Agency (SIDA), the primary funding agency for the Energy and Women project, sent as a representative Lotta Sylvander, who is based in Pretoria and is a gender specialist. The Japanese International Cooperation Agency (JICA) sent a representative Toshiyuki Hayashi, who

is an energy expert and rural electrification advisor based in Malawi. The World Bank was represented by Dominique Lallement, manager of the Energy Sector Management Assistance Programme at the World Bank.

Joy Clancy from the University of Twente in the Netherlands represented ENERGIA, a network that aims to link individuals and groups concerned with women and sustainable energy. Members of the ENERGIA network have played an important role in the formulation of the Energy and Women project. Dean Cooper from the Southern Africa Renewable Energy Information Network (SAREIN) also attended and informed people about existing resources and information data bases on renewable energy projects in the region. More information about this network is available at www.sarein.org.za.

The Energy and Atmosphere office invited two people from Uganda, Steve Hirsch and Edward Kyalimpa, who are working on a UNDP/GEF funded Uganda pilot project on photovoltaic systems for rural electrification. (UPPPRE). They have begun working with a local women's bank to encourage women's participation in credit opportunities for purchasing PV equipment. This initiative is of special relevance to the financing and micro-credit aspects of the Energy and Women project.

Additional participants came from government offices and non-governmental organisations in South Africa.

Because there were more countries than expected that replied positively to the invitation, there was not enough project funding available to support the attendance of the UNDP Country office representatives from each country. As a result, there were only five UNDP Country Office staff people who attended - from Angola, Lesotho, Malawi, South Africa and Zimbabwe. Special efforts are needed to ensure the engagement of UNDP Country Offices in the follow-up process, and to support their attendance at future project meetings.

3.0 Workshop Proceedings

The workshop was facilitated by Winifred Mandhlazi from the Minerals and Energy Policy Centre in South Africa. It was held in a conference room adjacent to the offices of the South Africa Department of Minerals and Energy in Pretoria. The first day opened with introductions of all the participants. Welcoming remarks were given by Jaana Rannikko from the UNDP host Country Office in South Africa, and by Lotta Sylvander from SIDA, representing the primary project sponsor.

Gail Karlsson from the UNDP Energy and Atmosphere Programme in New York then made a brief presentation about the Energy and Women project and the goals of the workshop. She discussed UNDP's potential role in facilitating and supporting new approaches to energy planning that address women's energy needs, but also look beyond women's roles as providers of food and fuel towards women's engagement as entrepreneurs and profit-makers and community leaders. She also emphasised that the Energy and Women project is not promoting any specific technology or approach, but is seeking to support ideas on sustainable energy systems developed by people working within the participating countries.

The remainder of the first day was devoted to the country presentations and discussions

of the issues raised in those reports. Summaries of all the country reports are attached as Appendix 2. A discussion of topics covered in the country reports and presentations is contained in section 4.0 of this report, and an analysis of major concerns raised in the reports is presented in section 5.0.

The second day opened with a presentation by Joy Clancy about the ENERGIA network. She noted that there are several factors contributing to the lack of attention to women and energy, including weak linkages between women's organisations and energy organisations, unavailability of good relevant case studies, and the absence of energy programmes with gender as a key theme. There has been some progress made regarding the role of women in energy planning as more attention is paid to a sustainable energy paradigm, as new gender perspectives and analytic tools are disseminated, and as more women enter energy professions. Besides providing opportunities for networking and information sharing through its meetings and newsletter, ENERGIA aims to encourage identification and implementation of needed actions, and to empower women through training, research and advocacy. Joy raised the idea of establishing a regional ENERGIA network for southern Africa. She also stressed the importance of increasing the role of women, and consideration of women's concerns, in mainstream energy programmes, not just small-scale renewable energy projects.

Next, Steve Hirsch gave a report on the Uganda Photovoltaic Pilot Project for Rural Electrification (UPPPRE). This is a project jointly funded by UNDP and the Global Environment Facility, and managed by UNDP in Kampala in cooperation with the Uganda government. It is a three year pilot program, begun about a year ago, designed to introduce PV systems on an unsubsidised basis to households, businesses and communities in areas unlikely to have access to the grid in the foreseeable future. The government wants to provide catalysts for the private sector to take over rural electrification efforts in a market-driven manner. Since the project is based on ability and willingness to pay, the strongest economic areas were chosen to begin to build the market. Credit arrangements, loan guarantees and extended payments are key elements of the financing schemes, which particularly focus on integrating solar investments into the lending activities of local banks. Although there was only minimal involvement of women in the project design, discussions with ENERGIA members helped prompt special attention to engaging women's banks in providing loans to women for purchasing PV systems, as well as in providing training for female end-users and technicians.

The rest of the second day was spent discussing various thematic topics selected by the workshop participants, with a general focus on strategies for designing better energy development projects and suggestions for possible UNDP involvement in supporting those strategies. The results of that discussion are summarised at length in section 6.0.

4.0 Topics Covered in National Reports

In preparation for the regional workshops, participating countries conducted national consultations or surveys, or prepared reports, in coordination with UNDP Country Offices, on the particular energy situation in each country, especially in relation to women's development needs and priorities. The object was to identify key energy bottlenecks and constraints, to discuss ways to support training and capacity building on

women and sustainable energy, and to identify recommended activities involving women, energy systems and entrepreneurship. The consultations and surveys included inputs from women's groups and other non-governmental organizations, energy and technology institutes, UN and bilateral agencies, governmental officials, and business representatives.

Reports on existing energy situations included information on such topics as the public and private organizations operating in the energy sector at national and local levels, the major sources of electrical power, the extent of the grid, the percent of communities and residents served in urban and rural areas, and the reliability of energy service. Most also identified major sources of fuel for cooking, heating, lighting, production, industry and agricultural work, etc.

With regard to particular energy needs and issues relating to women, the reports dealt with: the differing roles of men and women in household work, income-producing activities, and community management; particular needs of women for energy services for household and productive uses; special vulnerabilities of women and girls due to their use of fuels, including time allocation and health impacts; the extent of involvement of women in energy planning at different institutional levels; and constraints on women's participation in the design and implementation of energy services projects, including limitations related to literacy, social roles, training, and access to credit.

Participants involved in national consultations and surveys were also asked about past and current projects specifically targeted towards women: if there were ones that were successful; if so, what sort and how were they effective; if not, were there lessons that could be learned from projects that targeted women but were not successful, or that did not have any focus on the needs of women; and if there were ways projects could have been improved with more participation by women.

Countries were also asked to consider whether they had ideas for new activities or pilot projects that would better serve the needs of women, whether there were any such activities under way in the country that could be supported or studied, and whether there were any that specifically focused on income-producing opportunities for women.

5.0 Major Concerns Identified in Country Reports

During the presentations of the country reports, a number of common concerns emerged. Although not all the reports covered all the same topics, there were numerous similarities in the descriptions of overall energy conditions and particular difficulties faced by women. There were also similar patterns in the energy projects discussed, many of which dealt with improved cook stoves, briquette-making, wood lot management, solar electric panels, and solar cookers or food dryers.

The following is a summarisation of some of the major concerns raised in the country reports. The summary is drawn from the presentations given at the workshop and from a reading of the reports themselves, which were generally more detailed. Not all of the concerns listed below are contained in each report. Summaries of all the reports are attached as Appendix 2. The full text of each country report can be obtained from Gail Karlsson at the UNDP Energy and Atmosphere Programme office in New York or from Winifred Mandhlazi at the Minerals and Energy Policy Centre in Johannesburg.

5.1 Lack of energy services creates particular hardships for women.

Women are particularly impacted by the lack of modern energy services and growing scarcity of wood fuels, because generally they are the ones who collect fuel, cook over open fires, and have to use their own labour for daily household and production tasks. These daily tasks take up much of their time and physical energy, while subjecting them to health hazards caused by indoor air pollution and the difficulties of carrying loads of fuel wood over long distances. There is little time and opportunity for education or income generating activities. Without access to affordable energy services for productive activities, poor women cannot move towards sustainable livelihoods.

5.2 Energy planning processes, policies and projects generally have not been gender sensitive.

Women have had limited opportunities for decision-making at national, local and household levels. In most countries there is no real or effective framework for special attention to women's energy needs. Training is needed to help planners and decision-makers understand the special concerns of women, and to promote consultations with, and involvement of, women in local communities. The traditional roles of women and men need to be examined, as well as strategies for improving women's situations within particular countries and communities. Men need to be sensitised to gender issues so that they can become more supportive of changes leading to greater gender equality and improved conditions for women.

5.3 National energy plans need to be expanded and improved.

In most of the countries reporting, there are national plans for rural electrification, but most (and in some cases, almost all) rural households still lack energy services. In some countries, there are more women than men in rural areas because men have migrated to urban areas to seek employment. National energy plans have often focused on urban and industrial development rather than rural households, agriculture, and small-scale production. National and local government commitments are needed regarding expansion of energy options, with particular attention to the needs and concerns of women. Government energy policies also should be coordinated better with land use and forestry policies, and with general development strategies. There is a need for more accurate information and statistics about energy consumption patterns, which would contribute to more effective planning and policy formulation.

5.4 Better analysis should be done regarding past and current energy projects and policies.

Over time, a number of similar energy projects have been introduced in different countries, often promoted by outside donor agencies. Few of these have been successful. Past pilot projects need to be analysed for useful information. In general, this has not been done adequately. Too often, pilot projects have simply been discontinued and new ones begun without consideration of lessons learned from what was tried before.

5.5 Participatory approaches are needed in energy project planning .

Users of new energy technologies, who are often women, have generally not been consulted about their needs and desires in terms of energy choices. Community women have grassroots experience and indigenous knowledge about managing fuels and natural resources, and can make significant contributions to the development of the energy sector. But in all the countries represented at the regional workshop, the tasks related to policy formulation and project planning for the energy sector are conducted at the national level. Moreover, projects are often driven by donor technology choices. The involvement of communities in activities that focus on energy are very limited. Better consultation procedures with local communities and more participatory approaches are essential for successful energy plans and projects. Moreover, local cultural traditions and restrictions must be considered in the design of energy projects, otherwise new technologies will not be widely accepted.

5.6 Education and training of women is needed to increase their role in energy plans and projects.

Educating women, and women's organisations, about energy issues can help increase their roles in establishing energy plans, policies and projects. Given opportunities, women can make positive contributions towards expanding energy options, both in terms of planning and implementation. Education of girls in science, engineering and other technical studies, as well as leadership skills, would increase their ability to participate in energy decision-making processes, and to undertake careers in the energy sector. Education of women in business management and entrepreneurial skills can help them be more successful in their income-generating activities.

5.7. More public information is needed about possible energy options.

Poor households and rural communities have very little information about alternative energy technologies or how to use them. This presents a barrier to introduction of, and demand for, new energy options. In plans for disseminating information, low literacy rates for women must be considered. Radio and TV could be used for information and publicity campaigns in some areas. Networking can also provide opportunities for sharing information about successful strategies and

initiatives, as well as support and encouragement for women.

5.8 Financing arrangements are essential for project continuity

Projects are not sustainable if they rely only on donor financing and involve short-term planning. In several countries, projects collapsed because donor funding was withdrawn or failed to materialise.

Long-term financing and marketing strategies are needed to make energy projects self-sustaining.

Affordability and financial credit are key elements for providing users with choices of energy

technologies. In some areas, special efforts will be needed to allow women access to

credit and

financing schemes.

6.0 Key Themes and Recommendations for Action

This workshop was meant to gather information from a number of different countries about their views and experiences. The format was somewhat flexible in order to respond to the interests and concerns of the participants. During the workshop proceedings on the second day, the participants identified several themes of particular interest and divided up into small groups to discuss them. The groups then reported back on their conclusions, and there was additional general discussion about these themes.

The themes chosen were: (a) income-generating activities; (b) financial issues; (c) new approaches to project planning; (d) capacity building and information sharing; and (e) networking and advocacy. Each group discussed past failures, new strategies, recommendations for future action, and potential ways that UNDP could provide assistance.

6.1 Income-generating activities. Income generation is critical for poverty alleviation. Energy services are needed for productive purposes, not just household uses. Women can't afford to pay for modern energy supplies for their homes if they have no sustainable income base. But there has been little planning or policy focus on energy for productive uses by women.

Some income-generating projects involve energy itself as a product. For example, in Swaziland and Malawi, charcoal briquette pilot projects have involved women in producing fuel for their own use as well as for sale. Other types of income-generating activities, such as food production and processing, require affordable and readily-available energy sources. Both types of activities require a reliable means of transportation to markets.

Economic sustainability is the measure of success for these projects. Continuing reliance on government funding or donor support will not lead to viable on-going activities. But in some cases women have good business ideas and only need some initial support, and capital for equipment, to get started. Without that support, good business ideas are often taken over by men. Women's businesses tend to be small-scale, labour-intensive and limited to the informal sector. Strategic assistance with skills training and access to credit could help small women entrepreneurs improve or expand their businesses.

The best entry point for training and supporting women in entrepreneurial activities is through already-organised women's groups that come together for collective productive purposes. Once trained, individuals can break away to pursue separate business opportunities. It is essential, however, to design projects with the potential for private sector development. It is also best to target people already involved in income-generating activities.

6.2 Financial issues. The legal framework for lending institutions sometimes limits

women's access to credit due to requirements for male consent, or collateral requirements that differ according to gender. Advocacy efforts are needed to eliminate these legal barriers for women. From a business perspective, banks are often reluctant to make the small loans typically sought by women because of high transaction costs. In addition, women experience difficulties because of limited education, literacy and business experience.

It would be useful to focus on developing women's banks, or lending institutions specially targeting women, in order to address some of these barriers. In addition, women need training in management and business skills, particularly in drawing up viable business plans that would enable them to get commercial credit. Bundling of small loans could also make providing credit for women's business needs more acceptable to commercial banks.

Micro-credit arrangements set up through existing banks, non-government organisations and communities themselves can be effective ways to provide credit for people without collateral. Generally these arrangements involve groupings of borrowers without collateral into solidarity groups whose members are all responsible for repayment of the group's loan amount. Although these schemes have proven to be very useful, they tend to provide short-term financing in low amounts which may not be sufficient to move women out of poverty.

Donor financing of projects is not sustainable on a long-term basis. Revolving funds relying on repayments to finance additional loans, and loan schemes supported by donor guarantees, tend to become depleted because of mixed business and development objectives, and loose repayment requirements.

6.3 New approaches to project planning. The top-down approach has not worked. Conventional planning is sector-based and does not take an integrated approach to development. It is not clear how communities can benefit from existing plans and resources. In addition, there is little consideration of the differing roles and needs of men and women. Where women's issues are considered, the focus is on practical and immediate needs rather than on addressing their low economic and social status in general.

Recommendations: Encourage community initiatives. Make use of indigenous knowledge systems. Support inputs emphasising women's perspectives and knowledge. Accumulate gender-disaggregated data to define existing situations. Create better information channels between planning agencies and communities. Decentralise project implementation processes. Document case studies on strategies that have worked, or not worked. Disseminate project information and results widely, including through local government institutions and public libraries. Conduct monitoring and evaluation from the perspective of community participants, not just outside consultants.

6.4 Capacity building and information sharing. Different stakeholders have different capacity building needs. End-users need basic knowledge about energy options, equipment, sources of products, funding possibilities, and bargaining skills. Community organisations need to develop gender analysis skills, techniques for defining community energy needs, resource mobilisation skills, information packaging and dissemination capabilities, and training programmes regarding energy and women. Entrepreneurs and

service providers need to develop marketing skills, technical know-how, and an understanding of the financial capabilities of end users. Energy planners, advocates and policy makers need to understand community needs as well as linkages between gender and energy, develop gender sensitivity, enhance their negotiation and communication skills, and improve their ability to disseminate information and mobilise resources.

Causes of past project failures include: a lack of gender sensitivity; too much focus on technical issues; a lack of funding for income-generating activities for women; inadequate facilities for training and experimentation; and insufficient funds for start-up capital.

New strategies should include the development of gender sensitivity programs in combination with skills training in appropriate technologies, project management, negotiation and communication, confidence building and decision making, information acquisition and dissemination, marketing and bargaining.

6.5 Networking and advocacy. In the past, there has been little in the way of networking and sharing of information. Exchange of information among those who are concerned with energy and women's issues in various countries can lead to better project design and less reliance on trial and error.

Suggestions for better networking related to women and sustainable energy: (1) establishing a national focal point in each country, maybe within the UNDP Country office or an interested non-government organisation, to disseminate information within the country, especially to those without e-mail; (2) setting up an e-mail network, at least for those attending this workshop (see Appendix 1 for the list of available e-mail addresses for participants); (3) setting up an Internet web site; and (4) holding an annual round-table conference.

The World Bank Energy Sector Management Assistance Program and the ENERGIA network are already working with UNDP on ways to share information about best practices regarding energy and women. ENERGIA has been putting out a newsletter on women and sustainable energy, and the World Bank information system has a data base and web page with energy project information.

In terms of advocacy activities at the international level, one focus could be on providing inputs into the Beijing + 5 process - the UN review of what progress has been made in the five years since the international conference on women held in Beijing. Some countries are holding preparatory meetings, and there will be opportunities to provide inputs to delegates regarding the role of women in providing sustainable energy for development. Another opportunity for international advocacy will be provided by the ninth meeting of the UN Commission on Sustainable Development, which will focus on energy and transport. It would be possible to make a presentation at that meeting about women and sustainable energy, and about successful project strategies.

6.6 Recommendations regarding UNDP's Role.

The workshop concluded with a discussion about how the Energy and Women project could help support country programmes on women and sustainable energy. Key activities included:

(a) Gathering and disseminating information about energy projects, existing networks and technology options. Information gathering and networking is clearly a key aspect of the Energy and Women project, and the workshop itself is part of that effort. Yet the extent to which continued networking and information sharing occurs will depend in large part on the degree to which participants from different countries, and UNDP Country Offices, become engaged in and committed to that process. Dissemination of information within each country will require the creation of intra-country networks supported by the groups represented at the regional workshop and in the national consultations.

(b) Providing critical analysis of energy projects as a basis for strategic planning. Through a lessons learned study, the Energy and Women project already calls for an analysis of some past and current energy projects to see if there is useful information that can be applied to future energy activities. The lessons learned study, however, will have to be selective and strategic rather than comprehensive. Much of the information required to conduct project analyses will need to come from individuals within different countries involved in projects of general interest and applicability. Regional workshop attendees received a paper outlining draft criteria for cases to be considered in the lessons learned study, and Energy and Women project staff will follow up with country representatives on some of the case study information contained in the country reports.

(c) Supporting training programmes and technical assistance for national planners and local institutions. The suggested purposes of these efforts would be to promote education about women and energy choices, training for women in business management skills, and the need for better credit access for women. The UNDP-supported national consultations held in preparation for the regional workshop were intended to begin to focus national attention on the role of women in sustainable energy. As part of the Energy and Women project, UNDP's Energy and Atmosphere Programme staff will be preparing a briefing kit and training materials on gender and energy, which could be used for national and local training of energy planners. In addition, the UNDP Initiative for Sustainable Energy (UNISE) will be conducting training workshops in various countries, for UNDP staff, government officials, non-governmental groups and private sector representatives, and this will include a component on gender and energy. Micro-credit and financing issues will be covered to some extent by the materials prepared for the UNISE and Energy and Women training sessions, but general business management skills for women entrepreneurs are not. Perhaps other agencies or institutions have prepared training materials on that topic that could be distributed by the Energy and Women project.

(d) Providing analysis and technical assistance in designing projects to be financially self-sustaining. The micro-credit study which is part of the Energy and Women project will address some of the financing issues brought up at the regional workshop, but it seems that a more comprehensive look is needed at how projects are designed so that they can become self-supporting rather than relying on donor financing and being abandoned when the financing runs out. Some countries may want to consider pilot activities that focus in part on addressing this concern.

(e) Supporting advocacy about women, gender sensitivity and sustainable energy in national, regional and international fora, including follow-up to the Beijing Conference

and preparations for CSD 9. The Energy and Women project can certainly play an important role in calling attention to issues concerning women and sustainable energy at international meetings, and in connecting up national and local energy planners and activists with international discussions.

7.0 Potential Pilot Projects

The Energy and Women project calls for the development of pilot projects trying new approaches to sustainable energy projects, particularly ones that promote income generating activities for women. Project funding is available to provide technical assistance in the preparation of pilot project proposals.

Some countries did come with proposals for pilot projects which were outlined in their reports, but these were not discussed in any detail at the workshop.

All participants were asked to consider how to use the workshop information for follow-up action and application within their own countries. The Energy and Women project staff will confer with national representatives who attended the regional workshop and with UNDP Country Office staff about the possibility of incorporating projects focusing on women and sustainable energy into the next cycle of UNDP/Country Co-operation Agreements on development programmes and priorities set to begin in 2001. Where there is interest at the country level in designing new pilot activities, the Energy and Women project can provide some technical assistance.

In some cases, rather than starting to design new pilot projects, it might be more useful to add on to or redesign existing energy projects by helping to incorporate gender perspectives, to arrange for increased participation by women, to promote economic self-sustainability, or to reorient the project towards income generation opportunities for women.

APPENDIX 1 REGIONAL WORKSHOP PARTICIPANTS

Angola

Paul Mathaha SADC – Technical Assistance Unit sadctau@ebonet.net

Phone 244 2 340 182 Fax 244 2 343003

Munzila Jackson Dodao National Director for Energy

Phone 244 2 390385 17 Fax 244 2 343003

Liss Schanke UNDP Country Office liss.schanke@undp.org

Fax 244 2 335609

Botswana

Lapologang Magole University of Botswana magolel@noka.ub.bw

Phone 267 355 2509

Mmatlala Makwati Bosele Conservation Stoves Group

Phone 267 845 4024

Lesotho

Letlamoreng Mosenene Machobare Foundation

Jerry Seithleko Department of Energy solawind@lesoff.co

Phone 266 310 360

Lineo Mdee UNDP Country Office lineo.mdee@undp.org

Phone 266 313 790 Fax 266 310 042

Malawi

Lingalireni Mahowa Coordination Unit for Rehabilitation malawicure@malawi.net

of the Environment

Phone 265 645 757 Fax 265 645 492

Grace Mloza Department of Energy

Phone 265 781 934 Fax 265 784 110

Flemming Nielsen UNDP Country Office flemming.neilsen@undp.org

Phone 265 783 500 Fax 265 783 637

Mozambique

Fatima Arthur Mozambique Electric Company decedm@zebra.uem.mz

Phone 258 1 490959 Fax 258 1 493002

Mauricio Xirinda Department of Natural Resources dngm@zebra.uem.mz

Phone 258 1 465843 Fax 258 1 465849

Namibia

Njeri Wamukonya EDRC wamukonya@energetic.uct.ac.za

Lahja Amaambo Ministry of Mines & Energy lahja@iafrica.com.na

South Africa

Winifred Mandhlazi Minerals & Energy Policy Centre winifred@mepc.org.za

Phone 27 11 403 8013 Fax 27 11 403 8023

Molatelo Montwedi Department of Minerals & Energy mola@mepta.pwv.gov.za

Phone 27 12 317 9214 Fax 27 12 322 5224

Thembi Burhali Department of Minerals & Energy t.burhali@mepta.pwv.gov.za

Phone 27 12 317 9327 Fax 27 12 322 3416

Daisy Malatse Department of Minerals & Energy daisy@mepta.pwv.gov.za

Phone 27 12 317 9142 Fax 27 12 322 5224

Janna Rannikko UNDP Country Office jrannikko@un.org.za

Phone 27 12 338 5300 Fax 27 12 320 4353

Swaziland

Dr. Mduduzi Mathunjwa University of Swaziland nergyswa@realnet.co.sz

Phone 268 518 4011 Fax 268 518 5276

Peterson Dlamini Min.of Natural Resources & Energy nergyswa@realnet.co.sz

Phone 268 404 62244/8 Fax 268 404 2436/7252

Zambia

Wezi Nkana Zambia Women's Democracy Centre msl@zamnet.zm

Phone 260 1 250800

Langiwe Chandi Department of Energy doe@zamnet.zm

Phone 260 1 251337 Fax 260 1 254491

Zimbabwe

Washington Nyabeze ITDG/WEDS washy@harare.iafrica.com

Phone/Fax 263 4 668 049

Wilson Chuma Africa 2000/GEF Small Grants

Phone 263 4 700 938 Fax 263 4 700 946

Catherine Masaka UNDP Country Office catherine.masaka@undp.org

Phone 263 4 792 681 Fax 263 4 728 695

Other Participants

Joy Clancy ENERGIA - University of Twente J.S.Clancy@tdg.utwente.nl

Phone 31 53 489 3537 Fax 31 53 489 3087

Dean Cooper Southern Africa Renewable Energy dcooper@mega.bw

Information Network (SAREIN)

Toshiyuki Hayashi Japan Intn'l Cooperation Agency toshihayashi@malawi.net

Phone 265 781 644

Steve Hirsch Uganda PV Pilot Project for upppre@infocom.co.ug

Rural Electrification (UPPPREE)

Phone 256 41 34999277

Fax 256 41 230220

Lynette Hlongwane UN Pretoria lhlongwane@un.org.za

Phone 27 12 338 5033 Fax 27 12 320 4353

Gail Karlsson UNDP Energy & Atmosphere - NY gkarlsson@igc.org

Phone 212 267 4239 Fax 212 587 1148

Edward Kyalimpa Uganda UPPPREE uppre@infocom.co.ug

Phone 256 41 34999277 Fax 256 41 230220

Dominique Lallement World Bank ESMAP dlallement@worldbank.org

Phone 202 458 2849 Fax 202 522 3018

Nomawethu Qase EDRC noma@energetic.uct.ac.za

Phone 27 21 650 3230 Fax 27 21 650 2830

Deepak Singh M.L. Sultan Technikon singh@wpo.mlsultan.ac.za

Phone 27 31 308 5360 Fax 27 31 308 5400

Lotta Sylvander SIDA lotta.sylvander@sida.se

Fax 27 12 426 6464

APPENDIX 2 SUMMARY OF COUNTRY REPORTS AND PRESENTATIONS

ANGOLA

Munzila Jackson Dodao, Head of the Rational Use of Energy Department in Angola, gave a presentation on energy conditions in Angola and on past projects to promote energy efficiency and introduce alternative energy technologies.

Angola has a population of 12.6 million, 26% urban and 74% rural. Migration of the population to urban areas has increased in recent years due to internal war. About half of the land area is covered by natural forest. Wood and charcoal together provide 56% of the primary energy supply, electricity only about 2%. Biomass is the source for 85% of household energy consumption, electricity 1%, LPG 9% and kerosene 5%.

Case studies/projects:

Salted fish drying project: This was a demonstration project introducing the use of plastic solar greenhouse dryers. The dryers were expected to reduce the time required to dry fish and improving the quality of the dried fish. The project was not successful because it was designed by technicians, without the involvement of the target group – women who

dry and sell fish. The women were not interested in participating and the technology was not widely disseminated. The project was funded by oil companies operating in Angola, through the Citizen Co-operation group, and ended when the donor financing stopped.

Improved wood fuel and charcoal stoves project: This project was designed to survey household energy use and consumption, draw lessons from successful improved stove programmes in Africa, introduce energy efficient stoves, and train local artisans in the fabrication of improved stoves. The household survey indicated wide use of wood fuel, and a preference among women for LPG (which is not widely available or affordable). The stoves currently used by women were found to be energy inefficient. The project stopped after three months because the manager was transferred to other duties and the funding agency, UNICEF, then stopped funding the project.

Improved fish smoking kiln: This was a SADC project intended to improve energy efficiency in rural industry. It involved an assessment of wood fuel use, mathematical modeling of fish drying and design of an energy efficient fish smoking kiln. The new kiln is twice as energy efficient, uses locally available material, works in a much shorter time, can handle more fish at the same time, and produces better quality smoked fish. But due to lack of funding, promotion of this kiln was not undertaken, nor was the training program to teach local artisans to produce the improved kiln.

Lessons learned

(1) Women who are the target group for a project should be consulted during the planning stages of the project. (2) The government needs to make a commitment to ensure stable and continuous management during project implementation. (3) Projects collapse due to excessive reliance on outside donor funding.

BOTSWANA

A report was prepared for the regional workshop with funds from the UNDP Energy and Women project. It was presented by Lapologang Magole, a lecturer at the University of Botswana and a member of the GEF/Small Grants Committee. She consulted with a number of women's groups, NGOs, energy experts and government officials in preparing the report.

Botswana has had a significant increase in GDP over the past 20 years, but investments have been concentrated on developing urban infrastructure and mining industries. There has been a significant influx of men into urban areas for employment, leaving women behind in poorly developed rural areas. The main source of household energy is fuel wood, used mainly in rural areas. Electricity is available only in urban areas. The net energy supply for the country is composed of 69% fuel wood, 19% petroleum, 5.6% coal and 5.8% electricity. People in rural areas, as well as the urban poor, the majority of whom are women, lack high grade energy that can be used to power machines, as an input for productive activities.

Fuel wood is becoming depleted, especially around settlements, which has led to increased commercialisation of fuel wood collection, transportation and distribution. Most

women are not able to profit from this commercialisation, however, since it is generally men who own donkey carts, bicycles or vehicles to transport the wood for sale. Poor women increasingly have to travel longer distances to collect fuel, carrying the wood themselves, or have to pay for fuel wood.

Women's role in energy planning is very limited. Planning is centralised and local institutions only implement policies. The master plan makes no reference to the gender or economic status of users. Policy goals deal more with environmental concerns than with socio-economic issues. The government has a rural electrification program under which the government pays 90% of the connection cost and the individual pays the rest. But that 10% is still about \$1000, which is not affordable by rural women, who are generally unemployed or lack a reliable source of income. Without access to energy for productive activities, poor women can't move towards sustainable livelihoods. Without the involvement of rural and poor urban women in policy formulation, their needs will not be known or addressed.

Recommendations:

In order to ensure attention to women's energy needs, energy policy and planning should be decentralised to a local level where women can participate. Organisations and individuals working in energy research and innovation should also work closely with women, and involve communities in development efforts. Part of the reason why there are not many innovative energy projects to improve access for women is that there are no organisations set up specifically to deal with this issue. A good deal could be achieved by organising women into groups that can lobby and fund-raise for women's energy needs. When women are educated in energy issues and are aware of available alternative sources of energy, they will have the courage to stand up for their energy rights.

Case studies/projects:

The Manyana pilot project, implemented in 1992, involved installation of street lights and generation of decentralised PV electricity in several villages to test its social acceptability and economic viability. There were reported increases in economic activity, reading time for students, and social activity. A feasibility study indicated that there was a willingness and ability to pay, at least among some villagers, although it is doubtful that most poor women could afford PV electricity without assistance.

The Motshegaletau PV power station is a pilot project providing a small village with power for the school, clinic and households. It just opened in June 5, 1999, as a test of the technical and social viability of a PV power station.

Energy efficient stove project: This project has been approved for funding by the GEF Small Grants Committee, but has had problems taking off. The project proposal was prepared on behalf of women in the three villages with the objectives of reducing fuel wood consumption, promoting community-driven initiatives to reclaim degraded land, and manufacturing improved cooking stoves for sale. Efforts to introduce efficient stoves to replace wood fires have often failed because they have not recognised socio-cultural, economic, and environmental factors relevant in local contexts. This project emphasises the participation of the beneficiaries. However, transportation and logistical difficulties,

and inter-village conflicts, have hampered the initiation of project activities. If this project gets off the ground, however, it could provide a good model for a project that improves the sustainability of fuel wood use, and increases the income generating capacity of women - through sale of stoves, and also through increased time available for productive activities.

Other possible future projects could focus on improved management of trees and fuel wood so that this important energy resource is not over-exploited. Women should be encouraged to use at least one hectare of their land to grow preferred wood species. In areas with excess supplies of fuel wood, women could work with NGOs to acquire land from the land authority and obtain exclusive rights to manage and harvest fuel wood for exportation to deficit areas. Community woodland management sites can be set aside for natural recuperation and tree farming, as well as vegetable gardening. Women can also be encouraged to plant rows of trees in fields along with their crops. While outside technical advice will be necessary, people in rural areas where wood is harvested have much useful information that should be sought out.

LESOTHO

Jerry Seithheko from the Department of Energy and Letlamoreng Mosenene from the Machobare Foundation prepared a paper for the regional workshop.

More than 70% of the population of Lesotho is rural, with high dependence on traditional biomass fuels like wood, shrubs, cow dung and crop residues. Residential energy consumption accounts for more than 85% of total energy consumption in the country. Only 2-3% of the households are electrified, and those are mainly in urban and peri-urban areas.

Cooking and fuel collection are viewed as women's responsibilities. Women in rural areas spend more than 2.5 hours per day on fuel collection. As population increases, traditional fuels are becoming scarcer and women are spending more time and traveling longer distances to find fuel. Other forms of energy are not affordable to most of the rural population, so women are forced to continue seeking biomass fuels regardless of the environmental implications. Women are very

active in afforestation programs, however, forming the core of the tree committees and participating in drawing up the laws that run these committees.

In urban and peri-urban areas, women use biomass mainly for income generating activities like beer making and maize roasting. Other income generating activities, such as sewing and knitting clubs, water pumping and irrigation schemes, and poultry raising could be performed better if renewable energies such as solar were utilised. But because of the expense, it is difficult for rural women to tap this opportunity. The government feels that more support is needed for renewable technologies to be used in these types of businesses.

Lessons learned: Some prior pilot projects have failed because women did not participate in the early stages of planning. In other cases, development projects, like

bakery projects by rural women's groups, were not seen as energy projects and as a result energy issues were overlooked. There have also been problems with funding solar projects through revolving loan schemes. For instance, funding for the Lesotho Renewable Financing Agency under the FINESSE project has not become available as yet.

MALAWI

A national consultative meeting, funded by the Energy and Women project, was held on June 7 in preparation for the regional workshop. There were about 26 participants from government, NGOs, the private sector, and research institutes. Lingalireni Mihowa from the Coordination Unit for the Rehabilitation of the Environment (CURE) facilitated the meeting and prepared a report on its findings. Grace Mloza from the Department of Energy made a presentation at the regional workshop.

Over 85% of Malawi's 9 million people live in rural areas, and more than half the population lives below the poverty line. It is estimated that 70% of the female rural population are full time farmers, but women frequently lack access to the same tools, equipment, agricultural extension services, training and credit as men. As a result, their work is more time consuming and labour intensive. Women also experience low levels of literacy, education, political representation, and formal employment opportunities.

Trees provide about 93% of the country's energy, most of which is used at the household level. As supplies become scarce due to deforestation, women have to walk long distances to gather fuel, and cook fewer and less nutritious meals.

Malawi is in the process of developing a National Energy Policy. To date, only 4% of the population has access to electricity. Less than one per cent of rural homes are electrified, due to high capital costs for grid extension, high connection fees, and low income of potential consumers. The government has established a Rural Electrification Programme which will be partially funded through a levy on fuel. The programme is expected to encourage the establishment of agro businesses and small-scale industries, improve health services, increase agricultural production, and reduce dependence on fuel wood.

Firewood and charcoal are currently the major sources of energy for formal export industries such as tobacco and tea, as well as for small-scale industries such as brick making, fish processing and lime production. The sustainable biomass supply is estimated to be lower than current national consumption, a situation that is contributing to deforestation. Development of renewable energy sources is severely constrained by inadequate local knowledge and high costs.

Provision and usage of wood is primarily the responsibility of women. Diminishing supplies increase the demands made on women's labour time and limit their ability to engage in other productive activities. Women lack ox-carts and bicycles for transporting firewood, so carry the wood as head loads. Apart from these burdens, there is also a tendency to involve women in community projects without compensatory measures. Increased workloads for women often lead to increased reliance on female children as a

source of additional labour, reducing their educational and recreational opportunities.

Alternative technologies have been introduced in Malawi through a number of initiatives, but adoption rates have been low. Reasons for this include: (1) Unequal decision making at the household level on energy issues and low economic status of women. Women are looked upon as subordinates. Pilot projects exclusively targeting women have been unsuccessful because men lack vital information on these initiatives and as a result may not give women the necessary support to sustain the process. But if effective strategies for maintaining a balance in power relations between men and women are not in place, men tend to do the decision making and women the implementation. (2) Low literacy rates of women. (3) Cultural restrictions. The three stone fire is a symbol of unity for the family. Families also like to sit around the fire for social reasons. More efficient replacement stoves are therefore often unacceptable.

Women have been marginalised in the central planning of the energy sector. Yet, given opportunities, women have the ability to design and manufacture reliable energy devices and utilise existing credit facilities to invest in the energy sector.

Particular needs of women in the energy sector were identified as follows: increased levels of decision making in the household; better access to information about alternative sources of energy and technical know-how (taking into account low levels of literacy and education); greater control over land and natural resources; reduced work loads; and alternative sources of income.

Strategic objectives:

1) To enhance collaboration among the stakeholders in the energy sector through networking, sharing information, and documenting successful initiatives. (2) To make the energy sector more sensitive to women's needs and priorities through user training, creation of new marketing, commercialisation and investment opportunities for alternative energy products, encouragement of women's participation, and establishment of gender sensitive funding mechanisms.

(3) To promote gender-related participation in the formulation, implementation, monitoring, and evaluation of energy policies and practices, by means of gender sensitisation sessions for men and women, participatory approaches and gender sensitive indicators. (4) To identify projects that have positive impacts on women and document lessons learned from pilot projects. (5) To increase women's decision making roles in the energy sector at all levels, including women professionals and rural women with traditional knowledge. (6) To increase women's contribution to the development of, and their access to, energy technologies.

Case studies/projects

Ceramic stoves project: Women make ceramic liners to sell to tinsmiths who have been trained to make these stoves. The project has been somewhat successful, but the credit facility to finance purchase of the liners from the women was not implemented effectively.

Biomass briquettes project: This project presents good opportunities because of the

availability of local and cheap raw materials, the willingness of women to adopt the technology and easy adaptability of the technology, but women lack financing for commercialisation, e.g. to buy the pressers needed to make the briquettes.

Biogas project: Trained personnel are available, as well as plenty of animal waste, and locally available installation materials, but constraints are high capital costs for small biogas plants and difficulties in distribution of the gas to households at a larger scale.

Chikangawa softwood charcoal production: Softwood trees are available at Chikangawa forest plantation and there are opportunities for marketing charcoal in urban areas, but softwood charcoal was not successful in competitive markets because of preferences for charcoal made from indigenous hardwood trees.

MOZAMBIQUE

A presentation was made by Fatima Arthur from the Mozambique Electric Company, from a report prepared with Mauricio Xirinda from the Department of Natural Resources..

Approximately 82% of the population of Mozambique lives in rural areas. Almost all of the women in rural areas are engaged in agricultural production for household consumption or informal trading. Although women are household managers, any income they generate is often turned over to the man in the family. Men are generally the owners of land and houses, and decide on the distribution of cash resources, often with different priorities than women. Women are actually better as heads of families than men, with 71% of women-headed households above the poverty line.

Development programs should be designed for the whole community, not only for women. The key to improving the condition of women is to educate men to accept change. Women's income generation is affected by limited access to education, few employment opportunities, and high fertility rates. Improvement of conditions for women is closely linked with the existing family structure and opportunities for better incomes for the whole family.

Because Mozambique is mostly a rural or peri-urban country, with very low income levels, an energy development plan focused on rural areas would have a major impact on the population as a whole. Almost all rural households use firewood for cooking, as do 40% of urban households. Over half of the rural homes use firewood for lighting also, compared with 3% of urban homes, many of which use kerosene. Less than one quarter of urban homes have electricity for lighting. Energy choices are constrained by lack of accessibility and affordability of LPG and electricity. There is a need for better retailing of LPG and electricity supplies.

Factors relevant to sustainable energy development include:

Geographical diversification: Supply options need to be area-specific because levels of demand, end uses, consumption patterns and ability to pay vary throughout the country.

Good information and democratic choice: Customers have to be fully informed on the

technical and social costs and considerations involved in energy choices. Both men and women must be informed, since if men are not aware of the benefits of an energy option and it requires extra cash expenditure, they will not support it and the programme will fail.

Technical appropriateness: Energy options must meet the customers' expectations in terms of quality and reliability of supply. Higher efficiencies can reduce household costs. Energy consumption levels and patterns have to be adapted to the social, economic and technical realities of the communities served.

Affordability: Energy supply has to have a price that customers are willing and able to pay. Many low-income families depend on a daily, or seasonal, rather than monthly income. They may not be able to afford the investment of paying for electricity on a monthly basis or even buying a 11kg bottle of LPG that can last about a month. Payment schemes, like pre-paid energy meters, or small retailing options are needed to allow for smaller or irregular capital outlays.

Availability of credit facilities: The introduction or promotion of different energy forms should be supported by credit facilities for potential consumers for the acquisition of appropriate appliances. Promotion programmes must target both men and women, since men must approve family lifestyle changes and cash expenditures.

It is important to identify the needs and capabilities of target communities, analyze the social structures of communities, and formulate policies, laws and regulations that nurture integrated sustainable development. The intervention of the state is key to community development and sustainable energy development. It should be done through regulation and policies, drawn after extensive studies, surveys, analysis, and slow capacity building at the community level.

More important than designing development programmes for women is nurturing the development of communities as a whole. Development should be seen as an integrated process in society, supporting the establishment of infrastructure, economic opportunities, education and health facilities. Monitoring is needed to assess the impact of programmes on different social groups, since they will be characterized by differing interactions, capabilities, needs and opportunities. Improving the quality of energy supply as a whole will result in direct social and economic benefits to the population and women will know how to make use of the increased opportunities.

NAMIBIA

Ngeri Wamukonya prepared a report based on a consultative process funded by the Energy and Women project. Inputs from relevant stakeholders were obtained by means of questionnaires.

Despite a rural electrification programme initiated by the government in 1991, only about 10 - 15% of rural households have access to electricity, compared with 76% of urban households. Between 73-93% of rural households rely predominantly on biomass. In the communal agricultural sector, the main form of energy is human labor. Women and men

in rural areas expend enormous amounts of energy, often with high health risks

Wood is the predominant fuel for cooking, a task mainly performed by women and girls. About 75% of rural households use wood for cooking, and almost 40% of urban households. Almost 40% of urban households use electricity for cooking, but less than 10% of rural households. Besides cooking and lighting, other desired energy services include operating a TV, radio, torch, iron and refrigerator. Grid connected rural households use electricity for these services. Unelectrified households use dry-cell batteries for radio and torch, lead-acid battery for TV, paraffin and gas for refrigerators and wood for ironing.

The government has an Energy White Paper, but it contains only one explicit reference to women's energy needs. However, stated policies regarding rural woodland depletion, fuel efficient cooking technologies, rural electrification, forest management, commercial fuel accessibility and renewable energy awareness programmes could all improve the energy status of women if implemented in a gender sensitive manner. For the most part, there has been minimal consideration of gender-related issues in energy policy, planning and implementation at the national and local level. There is no framework for special attention to women's needs and most planners and implementing agencies are not gender sensitive.

The government's rural electrification programme is designed to connect socio-economic centres to the grid. Households within 500 meters from the transformer are connected at no charge. Identification of priority settlements is done in consultation with regional offices. There is no special consideration of women in the electrification process. Where women are members of the regional council they are involved in the consultations. Women are also involved in the construction work of power lines.

The main types of income generating activities engaged in by women are food processing, gardening, sewing and baking. Fuel wood is the principal energy source for baking and food processing. Because wood is not available close to settlements, women spend a lot of time and physical energy gathering fuel wood at the expense of other activities. Women are often unable to participate in development activities and meetings due to lack of time. Their ability to switch to alternative energy sources such as paraffin, gas and electricity is limited by inaccessibility and high costs. The majority of households are too far from transformers to be connected for free, and cannot afford to extend the grid.

Women are often consulted in household decision making, and make most of the decisions about household energy use if energy is not being purchased. If large capital outlays are involved, men and women would make the decisions cooperatively. Matters relating to the community such as land allocation are often in the hands of men.

Case studies:

Energy efficient wood stoves and briquetting machines. The project was started October 1998 by the Ministry of Mines and Energy in two communities. Workshops were held to inform communities of the project and get feedback. Twenty households were provided with clay stoves to test, and some were trained to make stoves and briquettes. A number of orders for stoves have been received from a Regional Awareness Project and from

private households, but it is too soon to judge the sustainability of the project. So far, all the financing, training, technical support, and hardware has been provided by the government.

Lihepurura Kavango Trust, an NGO, started projects in 1996-97 to improve the income status of rural communities through gardening, sewing, baking and brick making. Financial assistance was provided by Oxfam. There was inadequate training on management, however, and the roles of the donor and recipients were not well understood in the communities. The projects have not been able to continue without external support, in part because of bookkeeping problems, and lack of markets for the products.

Solar home systems: In 1996, the Ministry of Mines and Energy established a revolving fund for loans to buy solar home systems for lighting in rural areas. Selection of loan applicants is income dependent, so the poor, most of whom are women, are excluded. About 100 technicians from all the regions have been trained to install and maintain the solar systems, but only 10 of these are women due to the general belief that technical work is a male domain. The project has a market oriented approach and could be sustainable if customer satisfaction is assured. Repayment has exceeded 90%, with few defaults.

Community forest management: The Directorate of Forestry started a project in 1997 to create a suitable extension service and initiate community level discussions about forest management. The foresters at the local office are women and women have been consulted through gender separated workshops intended to gather baseline information. It is expected that both men and women will harvest timber and non-timber products from communal lands with agreed access rights. Loans will be provided for starting forest-related income generating activities.

PV pumping: In 1997, the Department of Water Affairs and GTZ installed PV water pumps at communal water points. Women were not involved in the planning, but two of the ten people trained on pump management were women.

Proposed energy projects to benefit women:

(1) Introduction of wood saving stoves in urban markets where food is prepared using wood fires. (2) Dissemination of appropriate solar stoves for households in southern regions with good solar resources. (3) Strategies to allow switching from wood to gas in low income urban sectors. (4) Provision of appropriate credit schemes to allow the poor to purchase solar home lighting systems. (5) Provision of mechanised ploughing equipment to women's groups. (6) Intensified rural electrification through grid and solar. (6) Capacity building to upgrade the Renewable Energy Information Network into an information centre.

Strategies to promote gender responsive policies:

(a) Gender training for the Directorate of Energy, NamPower, Northern Electricity and all other players in the energy field. (b) Soliciting opinions on energy issues from gender experts and the Department of Women's Affairs. (c) Seeking opinions from grassroots women and involving them in project implementation. (d) Setting up a mechanism to

evaluate energy projects at all stages for gender sensitivity. (e) Encouraging women to take up science and engineering degrees. (f) Informing and educating the public on linkages between energy and gender. (g) Establishing coordination and collaboration mechanisms among government offices dealing with women, energy, forestry, planning, housing and local government, to enhance access to energy.

SOUTH AFRICA

A national consultation meeting was held on March 29, 1999 in preparation for the regional workshop. The meeting was coordinated by Winifred Mandhlazi from the Minerals and Energy Policy Centre and funded by the Energy and Women project. It was attended by about 25 participants from government departments, policy research institutes, community based organizations, unions and the energy industry.

Since the Government of National Unity came into power, government energy policies, as contained in the white paper on energy and the national electrification strategy, have been aimed at achieving social equity, environmental sustainability and economic efficiency. Other policies, in the form of Affirmative Action and the Employment Equity Bill show government's commitment to addressing gender imbalances in the sector. But women and gender issues deserve more attention in order for women to feel empowered and to benefit from economic and natural resources. Women's issues are still viewed in terms of household energy requirements, and are addressed without considering the total system under which women live and operate.

The main problems identified concerning women and gender in the energy sector were:

(A) Access to energy and services. The affordability of energy by low income households is a major concern. Energy policies and programmes make no distinctions among different energy end-users. At the household level, men use energy, in particular electricity and batteries, to power radio and television sets or to engage in some income generating activity. Women, however, although they may use energy to generate income, primarily use energy for cooking and heating.

The availability of fuels is a problem for low-income rural and urban women. Scarce biomass fuels make up the major proportion of women's energy consumption. LPG distribution networks do not penetrate into rural areas, so energy choices are limited. Biomass resources are getting depleted, so rural women may have to walk further and carry heavier loads of wood. In collecting firewood, women also run the risk of getting raped or being bitten by snakes.

In general, the needs of rural areas are not given the same attention as the needs of urban areas. The government has concentrated on addressing energy needs at the household level and failed to look at how energy can play a role in enabling income generation or providing security for residents through community lighting.

(B) Access to information about energy. There are very few energy information centres, and they are not located near the people who need the information the most. Moreover,

information accumulated by the Department of Minerals and Energy is not made available to those who could benefit from it in provincial departments, local authorities, and NGOs. In a few cases, especially around urban areas, Eskom, the electricity utility, runs an information programme for residential energy users called Elektrowise. This programme is focused on promoting efficient use of energy at the household level using information brochures, and radio and TV advertisements. Rural households outside the boundaries of electricity service providers do not benefit from these information services.

(C) Control over resources and decision making. The issue of women as primary users of energy but lacking control over resources has been raised many times. This concern needs to be emphasised as it is linked to men's domination of decision structures at all levels in the energy sector. In addition, problems related to resource control are seen to be perpetuated by the uncoordinated manner of operation of various institutions including the Department of Minerals and Energy, the Department of Land Affairs, and the Department of Water Affairs and Forestry.

Problems are made worse by the fact that there is not enough consultation with women when policies are formulated. White male academics dominate decisions on policy. Participation of women in decision making structures is very limited. Even when women have gotten the opportunity to be part of these structures, they have not generally advanced the cause of gender equity, possibly because they felt co-opted into thinking like the males in the structures, or because they felt disempowered.

(D) Women's empowerment. Except for a single policy statement committing government to increase the number of women as energy specialists, plans for the empowerment of women as influential participants in the energy sector have yet to be developed or implemented. At the state level there are few women energy managers or officers. Similarly, there are very few energy professionals in the energy supply sector. At the community level, women's input on energy decisions is hampered by respect for traditional norms. Illiteracy and lack of information about energy also contribute to women's silence in community organisations.

Causes of gender imbalances in energy-related institutions.

Within Eskom, the electrical utility company, this industry has always been seen as the domain of white male engineers. There are few women engineers due to the educational system while encourages girls to move towards careers in social sciences rather than technical studies. Because of the dominance of male engineers, planning and implementation of energy projects is driven purely from a technical perspective, with no room for community participation. Non-consultation with end-users has been responsible for unsustainability of projects. Under the government's development strategy for electrifying 2.5 million households by 1999, Eskom has been responsible for rural areas while municipalities are responsible for urban areas. Time pressures to meet the target have limited consultations with end users, and since women were not organised around energy issues they were left out of what consultations there were with communities. There is also seen to be a bias in the allocation of the country's resources against the rural areas that house the poor majority of the population, in particular women.

The liquid fuels industry is market-driven and also characterised by white male domination. The distribution network does not reach certain areas, thus limiting energy

choices. Women lack skills and knowledge to participate in this sector. They also lack confidence and do not want to feel threatened by working in a male-dominated sector.

In the forestry sector, several different government departments have responsibility for policies determining whether or not women benefit from forest resources. There is a woman heading the forestry branch of the Department of Water Affairs and Forestry, but the staff is predominately white men trained in commercial or conservation forestry. Women have been discouraged from following careers as foresters. Community forestry, concerned with the forest-based needs of rural communities, is a new concept for the staff, and there has been no gender training for them. The National Forestry Action Plan puts the responsibility for community forestry on women and does not take into consideration the power relations between men and women. Forest plantations are solely for commercial use, and there is no strategy for distributing surplus wood and processing wastes to areas where they are needed. Men who own bakkies can travel longer distances to where the surplus is and transport wood and waste in their vehicles to sell to their communities.

Possible interventions: (a) lobbying for gender sensitive policies and budget reallocations; (b) increasing accessibility of practical, user-friendly information, using local government structures to reach the disadvantaged; (c) extracting recommended strategies from past research papers; (d) networking to support partnerships on women, gender and energy; (e) encouraging NGOs and community-based organisations to negotiate with suppliers and to challenge barriers to affordability and accessibility of energy; (f) promoting gender sensitivity and empowerment of women through clinics and workshops, and developing careers for women, particularly black women, in the energy sector; (g) mobilising men and women in communities to participate and take charge of development activities, with gender as a central focus point for capacity building.

Further research is needed on: (1) how gender and energy issues fit into the rural development strategy; (2) a comprehensive analysis of other energy sectors; (3) ways to link information on energy with other policies affecting women's access to energy resources; (4) reviewing energy policies from time to time in order for new changes to be addressed; (5) establishing a means of interaction on energy policy formulation between the government and communities; and (6) coordinating the process of policy review.

SWAZILAND

A report was prepared and presented at the regional workshop by Dr. Mduduzi Mathunjwa from the Renewable Energy Association of Swaziland, based on a literature review and stakeholder inputs. The Energy and Women project provided funding for the report and for a national consultative meeting scheduled for August 1999.

The economy of Swaziland is closely linked with that of South Africa, and is strong compared with most sub-Saharan African countries. Swaziland imports more than 90% of its commercial energy supply from South Africa, in the form of oil products, electricity, coal, charcoal and batteries. Firewood is available only by cutting down growing trees from the indigenous forest, which has led to land degradation through soil erosion in some areas. Deforestation is also caused by land clearing for agricultural activity,

increasing numbers of homesteads, and sale of wood for households in urban areas. High fuel prices and scarcity of wood bear directly on women, since traditionally the task of collecting firewood for household needs is the responsibility of women.

Households are generally located in urban areas, rural areas, and in company towns. Company towns are mainly in the agriculture, timber and sectors. In company towns, coal is usually provided free as a ration to employees, but it is not available to most households outside company towns. Only 2% of rural households are connected to the grid, and LPG is not easily accessible. Most rural households live on subsistence farming and cannot afford commercial fuels. Some rural areas have plenty of firewood and others do not. In rural areas, 90% of gross energy is from wood fuel, compared with 57% for urban areas and 21% for company towns. Urban areas generally have access to the electric grid, LPG and paraffin, but the initial cost of electricity installation, plus the cost of appliances, makes it prohibitively expensive for low income households. Paraffin is the fuel of choice in low income urban households, for cooking, ironing and lighting, because it is cheap and available, and so are the appliances used with it. LPG distribution is currently very limited, but its use is rising rapidly among middle income earners in peri-urban areas.

Solar energy is slowly gaining popularity. The low power and high costs of photovoltaic panels are problems, and the fact that they cannot be used for cooking. The Netherlands Energy Research Foundation is currently promoting systems that can be obtained on credit over 3 years, which makes them affordable to middle income households. The systems can power four lights, a radio and a TV.

Most household energy is used for cooking. In both urban and rural households, at all social levels, women and girls are responsible for cooking, water heating, ironing and cleaning. Most studies address energy use in the household as an entity, without discussing who is the actual end user.

In low income households, women may have to travel long distances for firewood, which is fatiguing and time consuming. Time lost in fetching wood and water and cooking on an open fire or single burner stove leaves women with less time for agricultural work and other income generating activities such as knitting, sewing, mat making and basket weaving. If wood is not available locally, women must use hard-earned income to buy wood or paraffin. Paraffin stoves cause fumes and pose a danger of exploding. Even in middle income households, fuel availability can be a problem, and energy costs can take a big fraction of income, leading to sacrifices in such areas as nutritional diversity. Women in high income households can generally afford electricity and electrical appliances, but they experience frequent power failures and power surges that damage appliances.

Recommendations:

Involving women in the formulation of energy policies. Women at all levels of income lose a lot of productive time on energy-related problems, time which could otherwise be spent on self-improvement and income generating projects. National energy policies should not just address the issue of providing energy to the household, but also look at the social and economic impacts of the provision of that energy. Women in rural areas are usually the most active people in community self-help projects. Relieving them from

energy problems can lead to the enhancement of overall development of communities. Women in all social levels need to state their energy needs and work with government departments for inclusion in policy formulation and project designs.

Regional networking. Networking can ensure that a solution obtained in one area can be shared by women's groups in other areas. Since a solution in one area may not be valid elsewhere, the qualities that make it work should be analyzed. By networking, women's groups can give each other encouragement and support.

Sensitising energy suppliers and appliance manufacturers. Because at first look energy does not seem to have a gender aspect, most energy and appliance suppliers have not approached the delivery of their products in terms of the end user.

Possible pilot projects:

Briquettes: The Ministry of Natural Resources and Energy (MNRE) initiated a paper briquette project to provide urban areas with an alternative to wood as a fuel source. The Home Economics Section of the Ministry of Agriculture and Cooperatives was chosen to carry out the project. The government trained women in making the briquettes, and distributed them to convenience stores, supermarkets and petrol stations for easy marketing. The women could work at or near home, and were enthusiastic about the pilot project. The project, however, has run out of funds.

Solar still: In areas where water from bore holes is salty or available water in ponds is shared with livestock, a solar still can be useful for purifying water. The time saved fetching and decontaminating water can be used for other household duties, agricultural activities or income generating activities.

Solar dryers: Women and Development under the Deputy Prime Minister's Office is involved with the development of solar dryers to preserve meat and produce where there is no refrigeration. Fresh produce is not available in the winter, and without preservation techniques, the winter diet is poor. Surplus produce in rural areas can be dried and sold during the winter months. This is a women-driven project and stands a high chance of success with women in other communities.

Fuel efficient stoves: Stoves can be made inexpensively from oil drums, but further research is required to improve their durability. Women can generate income by producing and selling these stoves.

Wood lots: MNRE has a wood lot where the trees are ready for harvesting, and wants to train the community on sustainable harvesting.

Biogas: Women and Development wants to introduce biogas digesters in communities where women are involved in pig farming. Prior projects were not successful in areas where there were few homesteads with animals.

Portable stoves: Urban food vendors are almost exclusively women. Food prepared the day before and transported to towns for sale is susceptible to contamination. If women can cook on the spot, the food will be better and they will have their evenings free for other activities.

Activities that can help women in sustainable development and income-generation include: (a) informational workshops concerning opportunities, product and service providers, what other women are doing, and how to get assistance for income generating activities; (b) training in technical skills needed by women to run income generating projects successfully, including financial management, business management and administration, marketing, customer service, and quality awareness; and (c) continuing assessments of women's energy needs.

ZAMBIA

The Women Democracy Centre of Zambia (WDCZ) conducted a stakeholder consultation in June 1999 in preparation for the regional workshop. The consultation was conducted through an interview process and was funded by the Energy and Women project. The report was presented at the regional workshop by Wezi Nkana from WDCZ.

Wood fuel (firewood and charcoal) provides 68% of the total energy supply in Zambia. Woodlands and forests cover 66% of the total land area. Household consumption, of which women are primary managers, accounts for 88% of wood fuel use. Indoor smoke pollution exposes women to serious health hazards, especially lung disease. In addition, the long distances women have to walk to collect firewood is a serious strain on their productivity.

Despite the fact that women are the main suppliers and users of wood fuel, their participation in the formulation, design and implementation of wood fuel based projects remains low. Women are always excluded from mainstream development. There have been a number of projects initiated on wood fuel, but they have not addressed the specific needs and priorities of women. Many have not been conceived to empower women, but rather to address environmental degradation, particularly deforestation, or to improve the efficiency of wood fuel consumption in stoves. Yet, women possess an enormous potential in making positive contributions to the development of the energy sector, both at the planning and end user levels.

The Department of Energy is responsible for programmes addressing wood fuel, solar and wind energy. Electricity and petroleum are in the parastatal and private sector, and the focus for these energy sources is on addressing the needs of industry and commercial sectors such as transport and mining. The current National Energy Policy recognises the potential for wood fuel as a renewable resource that can be managed sustainably, but little has been done to implement this, and the policy emphasis is on energy for industry. Women's work in fetching and preparing wood for domestic use is not quantified within traditional economic parameters. When firewood and charcoal are sold, then they become men's business ventures.

Women's needs in the energy sector include: (a) better access to wood fuel so they can spend more time on productive activities; (b) better access to efficient stoves to reduce cooking time and adverse health and environmental impacts; (c) better access to appropriate technologies that would enable women to use other sources of energy; (d) access to micro-credit to enable them to obtain new and renewable sources of energy as

well as initiate wood fuel based income generation activities; (e) access to education and training in skills to build confidence and enhance participation in decision-making processes.

Despite excess installed capacity, access to electricity remains low at the household level. Rural electrification has not been accomplished due to: sparse settlement in rural areas; low demand due to inability to pay; high electricity tariffs and high capital requirements for household electrical appliances; and lack of micro-credit financing schemes. The high cost of petroleum products, such as kerosene for cooking and petrol for transport, limits women's use of these resources also. Women spend more time walking to meet their business needs instead of using buses or trains. The time spent walking and preparing food keeps them from other productive activities that would contribute to sustainable livelihoods and enhance their overall participation in national economic development and democratic processes.

Deterrents to the adoption of new and renewable sources of energy include: lack of information about these technologies, especially in rural areas; high costs; lack of financing and fiscal incentives aimed at demonstration and application of solar, wind and modern biomass technologies, like coal briquettes. Pilot projects relating to these technologies should be complemented by a financing scheme to fund the initial acquisition costs.

Case studies/projects:

Charcoal Stove project: The objective was to disseminate an improved stove developed by the University of Zambia's School of Engineering. The model was agreed upon in consultation with women's groups. The project ran from 1988 to 1994. About 500 tinsmiths were trained in a number of towns. Constraints included the high cost of materials that discouraged tinsmiths from establishing themselves in this business, and the absence of an effective awareness programme on the benefits of the stoves to end users. Women's time issues were addressed but not their need for empowerment.

Charcoal production manual: Produced by the Department of Energy with support from the Stockholm Environment Institute, the manual was meant to address capacity building objectives by training charcoal producers to improve efficiency and management.

Woodland management: Most charcoal comes from the Miombo woodlands. Local communities manage much of the land. The project has conducted 3 training workshops for key forest managers on sustainable utilisation of wood resources.

Solar energy pilot project: In 1994 the Ministry of Energy and Water Development began a project to provide solar equipment for specific applications in rural areas, particularly at community facilities such as health and educational facilities. The systems included water pumping, lighting and medical refrigeration. The Ministry of Health has also installed solar energy systems for lighting and refrigeration to 200 health centres.

Energy service companies in rural areas: The Ministry of Energy and Water Development, with support from the Swedish government, is implementing a project on providing electricity using PV through energy service companies. This project can have a positive impact on the livelihoods of the communities, particularly women, if the elements

of credit and entrepreneurial skills are addressed.

Electrification of low income households: In this project 200 households were connected to the grid, through provision of a credit for the connection charge, plus a cooker and pressing iron. The project demonstrated that it is financially feasible to provide electricity to low income households on a large scale if credits are available.

Cook stove project: This project was undertaken jointly by the National Council for Scientific Research and JICA. Women make the ceramic component of clay stoves and men make the metal casing. Women are also involved in the marketing and distribution. It has the potential to economically empower women.

Lessons learned: Women's energy needs are critical and should be addressed; energy based projects should address environmental concerns, health hazards, functional literacy, entrepreneurial and leadership skills, as well as credit; better collaboration is needed between project engineers and end users; end users should participate in design of technology; community mobilisation is needed for viable interventions; regional networking on appropriate technology development should be enhanced; collaboration of all stakeholders should be enhanced to minimise duplication of efforts.

Recommendations: Gender analysis models should be used to assess women's needs and priorities and to review policies and projects; a study using a participatory approach should be done to define women's needs, priorities and potential, in order to provide information for policy and programme reviews; programmes for gender training and awareness on energy and women are needed; a programme on literacy, entrepreneurship and leadership training skills is needed for women in rural areas; a micro-financing fund is needed for energy activities that could contribute to sustainable livelihoods of rural women.

ZIMBABWE

A national workshop on women and sustainable energy was held in September 1998. It was originally intended as a preparatory process for a regional workshop to be organized by ENERGIA and ELCI, which was postponed and has not been held yet. The national workshop was funded by the Africa 2000 Network/GEF Small Grants Programme and coordinated by ITDG. It was attended by about 30 stakeholders from government, NGOs, community organizations, and academic and policy institutes. Washington Nyabeze from ITDG made a presentation on the national workshop report at the Energy and Women regional workshop.

Women play a central role in sustainable energy as users, producers, managers and collectors, yet little progress has been made to mainstream women into major energy programmes regarding formulation of policies and energy provision strategies. Government policies also seem to benefit urban populations at the expense of rural populations. Only 20% of rural areas are electrified.

The government energy policy is to support economic development and increase energy supplies to rural areas through appropriate technology. Major constraints in achieving

this are lack of finances, centralisation of the Department of Energy in the capital city, and the need for policies that are more gender and rural sensitive. The Rural Electrification Master Plan does not take into account the fact that financially deprived rural women will not be able to connect to the grid without financial assistance. The government takes a top-down approach and does not consult with end users at the community level, so decisions are made in an abstract environment and technologies are developed that have little relevance to users. Government policies and resource allocations have been biased towards the supply of electricity and petroleum, at the expense of other energy forms which are more accessible to rural women and could be used on a more sustainable basis.

Case studies:

Chingwa stoves: These fuel efficient wood stoves are being used by women with a high rate of acceptance. The stoves substantially reduce the need for fuel, reduce health hazards from smoke, provide more space for cooking than the traditional open hearth, and are inexpensive to make with locally available materials. There are some people in the community who are not into the technology and are discouraging others from using it, but education campaigns are being undertaken to raise awareness and acceptance.

Plant oil project: In 1995, Biomass Users Network conducted feasibility studies on the potential for using oil from the *Jatropha Curcas* Linn tree as a source of fuel. Lamps using the oil have been designed and given to villagers to use on a trial basis, and candles have been made also, but the fuel price remains prohibitive for use as an alternative to paraffin.

Biogas digesters: In 1987 UNDP launched a programme to install 24 biogas digesters for lighting and other domestic needs of communities. The programme was a failure due to lack of knowledge and understanding of the technology by end users. A top down approach was used without any consultation with users. Training of end users was also inadequate.

The GEF/Small Grants Programme has supported a biogas digester project in Insiza district, which has been better received. The biogas digesters are built in clusters and there are currently five clusters, each with five families participating. Introduction of the digesters has created employment among the communities in that people are planning to embark on projects like poultry raising and pig farming that will provide waste for use in the digesters. Construction of the digesters, however, is expensive and labour intensive. Supplies of water and dung are also required.

Solar cookers: This technology was introduced to the University of Zimbabwe – Development Technology Centre by Solar Cookers International in 1996. The cooker is made out of cardboard with aluminum foil on one side and is portable and convenient. The initial order was for 100 cookers. Now 600 units are being used in areas where there is scarcity of fuel wood and people were using paraffin.

Recommendations:

Key government policy concerns identified at the national workshop included: lack of participation of users in formulating energy policies; isolation of energy policies from

other government policies, especially land distribution; lack of assessment of desirability of technologies; and gender insensitivity.

Regarding NGOs and partner organisations, the following needs were identified: increased community involvement and sharing of information; strengthened coordination to reduce duplication of efforts; action oriented research to empower communities; workshops on energy provision; dissemination of information through print and electronic media; raised awareness of gender and energy issues; and use of indigenous knowledge systems. In addition, community based organisations should be encouraged to take the initiative to set up their own institutions for sustainable energy, to coordinate and share information, to undertake gender sensitisation workshops, and to speak up for themselves in meetings. Communities themselves need user friendly information about sustainable energy, and training in the use of new technologies, taking into account cultural impediments constraining the use of new technologies.

Other recommendations: (a) Government should assist communities and individuals with financing energy projects, through low interest loans and community funding schemes. (b) There should be a clear, single gender-sensitive government policy on the provision of energy to rural areas. (c) Strong publicity campaigns should be used to disseminate information. (d) Communities should be mobilised to solve their energy problems.

A government paper on women and sustainable energy, prepared by the Department of Energy Resources and Development, was presented to the national workshop participants. The paper noted that most renewable energy programmes in African countries were donor pushed, and once the donors left or donor funding to the projects was terminated, the sustainability of the projects suffered greatly.

Another paper on women and sustainable energy prepared by ZERO – Regional Environment Organisation, made reference to the GEF/UNDP funded project "Photovoltaics for Household and Community Use in Zimbabwe." The project has managed to install more than 9000 systems over 5 years. The project features a revolving loan fund for purchasers of systems, and reduced import duties on imported cells. The systems are installed by more than 40 companies. Some private sector firms have also started manufacturing system components. But the use of solar PV has also encountered a number of problems, including limited affordability, lack of standardisation of systems, and lack of training and education about the technology, particularly regarding repair and maintenance of systems.