Gender and Poverty Challenges in Scaling Up Rural Electricity Access*

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When I was first asked to give this presentation on gender and poverty in scaling up rural electricity access, I went back to the Village Power '97 Proceedings from last year and looked for what had been discussed on poverty and on gender last year. I found very little. Out of maybe 50 or 60 projects that were presented in the course of the meeting, for example, there were only two (2) that even mentioned women; and there was very little discussion of poverty issues. This was very different in the presentations yesterday and this morning at Village Power '98, and in the workshop on Women and Energy Sustainability on Monday. I want to take this opportunity to thank the organizers of this year's meeting and yesterday's speakers, and of course the speakers in this session, for putting poverty alleviation and gender squarely on the international agenda for scaling up rural electricity access at VILLAGE POWER '98. That makes my job this morning much easier.

Sustainable rural energy development and the 1990s global energy agenda

Sustainable (energy) development has been defined as (deLucia, 1990):

(1) Equitable growth - betterment for *all* people but *with particular concern for the poor*;
(2) Avoidance of natural resource degradation or depletion; and
(3 Self-sufficiency with respect to organizational, fiscal and managerial inputs.

Decentralized power clearly meets the second criteria above; considerable attention is presently being given to the third; to the first, in light of current international development priorities, "particular concern for the poor *and women*" should probably be added.

For example, sustainable human development goals are currently defined by UNDP as: (1) eradicating poverty; (2) increasing women's role in development; (3) providing people with income-earning opportunities and livelihoods; and (4) protecting and regenerating the environment.

Most renewable energy activities have in fact been justified largely on environmental and global climate change grounds in the 1990s. The Kyoto targets on carbon dioxide emissions have given these efforts a renewed urgency. The global energy agenda today recognizes that the energy-environment link is often a negative one, yet more energy is needed for growing

populations and for increasing energy demands with higher incomes. Energy efficiency, fuel switching and renewable energy are possible solutions that are technically mature and commercial. These activities are to be promoted through "sustainable" market processes, but are still hoped to be affordable for the poor. Hence "market barriers" need to be overcome to reach their primary target group of poor, rural households.

What about the poor?

We spoke a lot yesterday about poverty alleviation, while at the same time talking in terms of market approaches to promoting renewable energy. At a time of global economic crisis, when rather than poverty alleviation, we are seeing tens of millions of people likely to be pushed below the poverty line, it seems especially important to clarify what our approaches to scaling up can be here.

What about the poor? There are three approaches to access by the poor that have been followed in scaling up rural electricity access. First, access by the poor has been ensured through targeted measures, such as subsidies or community/NGO approaches. These has been justified by the fact that access to adequate energy supplies is critical to livelihood strategies of the poor. The poor, with irregular and unreliable incomes, cannot afford to invest in more efficient appliances or to buy in bulk, and thus end up paying more per unit for energy.

The problem with this approach is that subsidies may not be sustainable; and the community/NGO approach is risky, time-consuming, and input-intensive, and may not be replicable everywhere.

A second approach that is being experimented with a lot lately, is to make credit available to purchase renewable energy technologies, in order to overcome the market constraint of high capital costs and limited credit for renewables. However, the most optimistic credit scenarios for e.g. solar home systems (SHS) assume that 50 to 75 per cent of rural households will be able to afford SHS, even with liberal credit programs in place. That still leaves 25 to 50 per cent of rural households without electricity!

And offering credit to poor households can even have perverse effects: Total household energy expenditures of poor households typically increase following rural electrification, likely decreasing expenditures on food; debt payments may not be sustainable, given irregular incomes; and poor households even risk losing their original investment through repossession.

The third approach to expanding access is simply to ignore the poor. They can't afford rural electrification anyway. Marketing should aim at higher income households who can not only afford the initial costs, but can afford to take on the risk of trying out new technologies. Some poor households will still be able to finance and benefit from renewable energy technologies through cash purchase (gifts, remittances, savings societies).

However this approach not only contributes little to poverty alleviation; it runs the risk of even intensifying inequalities between rich and poor, as happened with the introduction of improved agricultural technologies during the Green Revolution in Asia.

All of these strategies have some role to play in increasing access to electricity in rural areas. But as we see above, none of them is entirely satisfactory. So if we want to link rural

electrification to poverty alleviation - and I think that we do, especially those of us working in development organizations - then we need to be coming up here with some more innovative solutions to access. Leasing, and micro-credit through solidarity groups, for example, are promising new approaches we have heard about this week.

How are gender and poverty related?

How are gender and poverty related? Poverty means, among other things, limited access to energy sources. Poverty influences and determines energy choices of households. It is also one element that can enhance or detract from survival strategies of the poor.

The main source of energy in poor rural households is not biomass. It is women's labour. The real energy crisis in rural areas is women's time.

This graph shows the allocation of time to survival activities by gender for a few selected activities in several countries where time use data is available. [1] As Mieko Nishimizu [World Bank Vice President, South Asia] so eloquently described to us yesterday morning, clearly this burden falls disproportionately on women. Cooking, firewood collection, food processing, water hauling - this is productive work, this is necessary work, but it is unpaid work, it does not enter the market. It is not recorded either in national accounts or in energy balances.

So energy poverty has a gender bias in rural areas.

Another gender-poverty linkage: women-headed households. This table shows the high percentage of households headed by women throughout the world. The figures are regional averages; in some countries they are much higher. In Botswana, for example, 46% of households are female-headed. Women-headed households are poorer than male households, and they are more vulnerable to energy scarcity. Certainly if we look at that 25-50% of households who cannot afford solar home systems, even with credit, a disproportionate number are likely to be households headed by women.

Market demographics of renewable energy

Now that we have talked about some of the ways that the market can fail to provide access to energy for the poor and for women, let's talk about what the market can do. What are the market demographics of renewable energy and women? Some of you may have noticed that women are different from men (I refer here of course to their energy consumption!). *Women use energy differently than men.* They have different energy needs, too.

For example, this overhead shows the different home lighting and connection point preferences of women and men in a biogas village power project in Ghana. I would like to make a couple of points here. First, women want to use home lighting to make their work easier and more productive - both their domestic work and their income-earning work. Remember, many of women's income-generating micro-enterprises are home-based. The income from these small-scale, part-time activities is often absolutely critical for their families' survival. But like women's domestic work, these income activities are not highly visible -

[1] Thanks to Barbara Farhar of NREL for this overhead, using some of my data but presenting it in a much "sexier" way.

women often don't go to a workplace, they are weaving while taking care of children, or preparing foods to sell at the same time that they cook the family meal and so on. Women work at home in spurts when they have time, often after the children are in bed. They need light where they work. One bulb in the living room may not meet those needs.

Men on the other hand, in this case at least, are mainly interested in the entertainment value of electricity. We see this too in unelectrified areas. Have you ever seen a woman taking a car battery used to run a television to be recharged? Men do this. Men also are - not always but usually - the purchasers of batteries for radios, and batteries are often a major household energy expenditure.

Of course these electricity needs could be different in other areas (in another example I have from a South African township, men are also interested in income-generating uses of electricity), but I think this example is interesting to illustrate that there can be real differences between women's and men's energy needs.

What about cooking?

What about cooking? This is women's energy need *par excellence*. Cooking is time- and effort-consuming. We worry a lot about the burden of fuel *collection* on women, but fuel collection, even in very fuel-scarce areas, takes maybe 1-2 hours per household per day. And at that level of scarcity, men are probably also participating in fuel collection, as well as women.

But *cooking*, and food preparation, and cleaning up - remember, cooking with biomass fuels is *dirty*, too - the cooking activity takes 5 or 6 hours/day, and this is virtually all done by women in every culture. Of course, there are the negative health impacts on women and children, too.

Cooking is also, I would like to point out, a very large share of household energy consumption, and *the largest single rural energy use in low-income countries*. It is even larger if we include women's micro-enterprises, where food processing and other energy-intensive activities make up a considerable proportion of informal sector energy consumption.

This means that, *unless cooking needs are addressed, positive impacts on carbon dioxide emissions, on deforestation, and on women's health and time will be fairly marginal.*

And *electricity provision does not address rural cooking needs* in most cases. In particular, most decentralized electricity systems cannot address cooking needs at reasonable cost. Now I wanted actually to talk a little about the potential for electric cooking, but not wanting to be responsible for any engineers having heart attacks so early in the day (yes, electric cooking is thermodynamically inefficient and expensive to use, but even rural women in developing countries like it and in some cases, use it), let me just mention one point here. A few people are working on low wattage and low-cost electric irons, burners, kettles, someone yesterday brought up DC appliances: How about focusing *more* technology research on these end-use appliances that women are interested in?

What high priority needs of rural women could be met by electricity?

There are however other energy needs that rural women have, that can be met by electricity, such as:

- saving labour in water collection by energizing water pumping;

- saving labour and time in cooking where feasible, e.g. with excess output from small hydro, perhaps with low-wattage, low-cost appliances;

- saving women's time and labour in agricultural processing such as grain grinding, rice hulling and oil extraction.

- improving security and women's ability to participate in community and school activities at night, with street lighting;

- making women's domestic work easier and improving the productivity of women's income-earning work through home and commercial lighting, refrigeration and key appliances like blenders and irons - with connection points, naturally, in the places around the house where women work; and

- improving women's and family health, through water purification, and perhaps in innovative ways like solar-operated fans to remove smoke from kitchens.

Of course there can be many others, but those mentioned above are certainly among the priorities for many rural women. There are many elements to meeting these needs: technology research and adaptation aimed at women's needs; targeting women in marketing and extension; ensuring complementary infrastructure to enable energy to increase productivity; and empowering women to use energy to improve their status and confidence, among others. One of the most important, though, is undoubtedly guaranteeing women's equal access to credit.

Women need credit

One of the key areas for enabling women's participation in renewable energy is credit and finance. We are hearing a lot at this meeting about measures to ensure affordability of renewable energy, including credit. Women need credit for renewable energy: first as end-users, to be able to afford labour-saving technologies and appliances; secondly to improve energy efficiency and profitability and save labour in their micro-enterprises; and thirdly, perhaps as energy entrepreneurs who could sell and maintain renewable energy technologies. The latter two are especially important, because we know that women use additional income from their enterprises for food, for school fees, for clothes for their households.

There are several arguments, summarized recently by Amulya Reddy in ***ENERGIA News***,[2] for women logically being appropriate renewable energy entrepreneurs for household and small-scale industry:

[2] The quarterly newsletter of ENERGIA, the International Network on Women & Sustainable Energy, c/o TDG, P.O. Box 217, NL-7500 AE Enschede, The Netherlands, <www.energia.org>.

- women are users of these devices, so they may be more sensitive to customers' desires, e.g. women potters produce and market 11,000 stoves annually in West Kenya;

- women are effective entrepreneurs with a good credit record, e.g. in 1996, 94% of Grameen Bank borrowers were women, with a 98% repayment rate;

- women can more effectively market to women, e.g., the Vietnam Women's Union is promoting solar home systems and collects payments.

To this we should add too the important point that Ambassador Spearman made yesterday, that women are often more effective in maintenance and repair than men are. There is a long and well-documented successful experience of involving women in hand pump maintenance in the water sector, and we are starting to have some positive anecdotal evidence on women being effective in maintenance of solar home systems and biogas plants too. As Ambassador Spearman pointed out, one reason is because women are less mobile than men, they tend to stay in the rural area where they receive training, and not to take those skills off to urban areas.

What kinds of financing programs have been successful in providing micro-credit to women? This overhead gives information assembled by Women's World Banking on business credit for women. Poverty-focused programs within commercial banks; poverty lending banks; non-governmental organizations; and affiliate network institutions have been most effective. As you can see, some of the portfolios are quite substantial, in the multi-millions of US dollars. Some of these programs have quite a high proportion of women participating, and some target only women. The average loan size is in some cases in the right order of magnitude for solar home systems, for example. And the repayment rates are quite high, mostly in the high 90s percentiles, much better we might note than figures we have been hearing lately from some major commercial banks with more conventional portfolios. We should note too that these repayment rates refer not only to women, but to the total portfolio of low-income borrowers in these micro-credit programs.

What are some of the factors that make these credit programs accessible to women?

Frequent and flexible repayment schedules, alternative collateral requirements, low transaction costs (in money and time), an informal banking atmosphere where women are respected, simple loan application procedures to accommodate illiteracy, and the use of information channels accessible to women, are all factors that have been found to favor access by women to credit programs (UN, 1995). Many of these factors favor low-income borrowers as well.

For example, conventional credit programs require land or property as collateral, which women often don't have; frequently they require a male member of the household to co-sign a loan. Alternative collateral like jewelry, that women have, or solidarity groups that guarantee repayment through social intermediation (as just described by Grameen Shakti), can facilitate women's access to credit.

Other design characteristics that contribute to women's access to credit have been identified in South Asia as (Bennett and Goldberg, 1993):

- Training services that recognize the economic constraints and cultural barriers faced by women clients;

- Incorporation of women staff members in both promotion and delivery of project services; and

- Use of community networks and self-help groups.

Some recommendations on gender and village power

First, there is so much that we don't know because we do not have information by gender. If you take one message home from this presentation, please take this one: disaggregate by gender. I think you will discover some very interesting and useful findings when you look separately at the differential activities, roles, preferences, constraints, participation, and access by women and by men. Though we often focus on women's needs because these have been neglected in the past, probably there are gender issues that relate specifically to men's roles and needs, too, that should be explored.[3]

In addition to analysing separately what women and men do, it is important to look at the ways they work together in energy activities such as construction and maintenance and household decisionmaking. The interrelationships between men and women in community and other organizations also bear examination.

We talk about the market demographics of renewable energy: how are we going to provide rural energy products if we don't know who our customer, who our client is, and how to best target HER? I would like to issue a challenge right now to each and every presenter that follows, to disaggregate by gender in their presentation.

We need to know for example, in market surveys, are women or men the customers? I was interested to see in Richard Hansen's talk yesterday that all the SHS customers he showed in the slides were women. If the customers are women, do they have access to cash income that will allow them to purchase the energy system? Who controls the income and who makes the decision in the household to purchase energy appliances? We have to think of how to structure credit programs so they will be accessible to women.

We have a session on financing. Tell us, what share of your loan portfolio is made up of women and what share is men? What are the repayment rates for women and for men? We know that women have an excellent credit record in micro-credit schemes generally; is the same true for renewable energy financing?[4]

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[3] For example, in some areas men are more interested than women in street lighting, because they go out more at night and are victims of violence more; men often put a high priority on children's studies; men tend to use electricity for small tools operation in income-generating activities and therefore need higher wattages; and the common initial PV application of lighting and entertainment uses in drinking establishments in remote villages could encourage an increase in male alcohol consumption and absence from the household.

[4] One of the few renewable energy credit programs to target women is in the Indian Renewable Energy Development Agency (IREDA). Although in operation just over a year, preliminary evidence suggests high repayment rates by women.

Later today we are talking about the role of electric utilities in rural electrification, power supply options, and service models. What have been the impacts of these approaches on women and on men, what have been the benefits? I would like to see disaggregated data on benefits, not just on the number of installations or amount of loan disbursements.

Second, renewable energy projects and technology research need to specifically address women's needs for labour-saving, for time-saving, for improved health, for security, and for income. Women use energy differently than men, and they have different energy needs. Electricity can meet some, but not all of these needs. Cooking is women's most critical energy need. It is also the *only* household energy use whose replacement is going to have any *significant* impact on carbon dioxide emissions and global climate change. Please, with all due respect, stop telling me that solar home systems are going to decrease deforestation or reduce global warming. It just ain't so.

Thirdly, we need to ensure women's equal access to credit and training in village power projects. Larry Flowers [International Programs, NREL] put up a list yesterday of institutional factors that are constraints to renewable energy promotion - credit, training, cultural factors, and so on. All of these constraints are exacerbated for women. Women are less literate than men, they have less access to credit, less access to information, etc., etc. So we need specific approaches to reach women.

There has not been much time today to talk further about access by the poor to renewable energy. We may notice however that the poor (in addition to more often being women) generally share many characteristics with women: a lack of disaggregation of access and benefits of energy technologies targeted to them; a high proportion of total energy used in cooking and meeting basic needs; inequitable access to credit and education; and so on. Hence many of the approaches required to reach women will also facilitate access by marginalized groups generally to renewable energy.

Fourth and finally, we have been talking a lot about partnerships. We need to build alliances and create a dialog between renewable energy and gender, at the research level, at the planning and programming level, and at the political level. There are some interesting recent initiatives to do this, such as ENERGIA, the International Network on Women and Energy, where a quarter of the 1000 members are men. Energy programs, such as UNDP/SEED and NREL, are also initiating activities on gender and energy.

The political element was mentioned several times yesterday. Women are a powerful force for social change, and renewable energy is about social change. Women have been highly commited and politically astute, at the forefront of the anti-nuclear movement, the peace movement, the ecology movement globally: there is an obvious congruence of interests around renewable energy. We need to build these partnerships.

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