

Integrating Household Energy into Rural Development Programmes

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Introduction

Despite urbanization, people in developing countries still live in rural areas and will continue to do so for the foreseeable future. Agricultural production is the basis of rural economies, but other rural industries such as fish smoking, beer brewing, production of simple agricultural tools, and tea and coffee drying also provide essential livelihoods in most rural areas. For this reason, *rural development* in this article refers to more than just agriculture. For most farming households, agricultural production and rural industries are still non-mechanized and labor-intensive, hence depend on the health and well being of family members. National and international development efforts should therefore focus on creating favorable socio-economic and environmental conditions that increase people's chances for improved livelihoods.

This applies to all households, but is more critical for women-headed households, which today in some areas of sub-Saharan Africa (e.g. South Africa, Zimbabwe, Ethiopia) constitute fifty to eighty percent of small and medium-scale rural households. The reason for this high percentage is that during the first stage of urban migration it is men who move to town, leaving their families behind. This puts a heavy burden on women who are responsible for the households *and* the farms. Since household energy plays a large role in women's work, one of the most effective ways of supporting rural development is by integrating household energy activities into all types of rural development programs. This article shows why this is so and describes the benefits and limitations of this approach. All statements are based on practical experiences in development projects in in East and West Africa.

Before arguing for the inclusion of household energy in all rural development programs, I want to reiterate the importance of directly addressing women in those programs. Development policy has finally accepted that development processes only succeed when carried out by those who want to develop themselves. How, then, can development succeed when a large segment of the population, namely women, is not included in development efforts or is included only as a separate, disadvantaged group? In reality women are the backbone of society, doing much of the work in the fields¹ as well as caring for their families. Yet many rural development programs still address the male farmer in extension work, either because culturally women are not expected to take part in public meetings or because information is thought to reach women through their husbands, which usually is not the case. For example, a study in Zimbabwe (Hagmann *et al*, 1996) reported that in a specific case where men visited a research station, the women were informed only in exceptional cases; in another case where women were given this opportunity, the men were also well informed. This is because of the traditional communication structure in that society in which information passes from women to men in the family, and, in the community, upwards from normal citizens to leaders but not downwards. If vital information is to be communicated, therefore, it makes sense to

¹ This definitely holds true for most of sub-Saharan Africa. Notable exceptions are some Islamic societies, where women are more restricted to the home.

address the women farmers, since through them the information will reach their husbands also.²

Why should household energy be integrated into all rural development programs? Fuel collection and cooking are tasks that can and do absorb a large part of women's daily workloads (from two to twenty hours weekly according to statistics taken from surveys of GTZ-supported household energy projects). This then is an entry point for rural development programs, since improvements in this area open up a whole range of opportunities for rural women in terms of time savings, income opportunities, community participation, environmental awareness creation and social empowerment. When household energy conservation becomes part of rural development programs, women automatically become the focus of attention and gender questions play a practical, not just a theoretical, role.

It is essential that women themselves decide what to do with time saved; otherwise there is a danger that important social duties, such as attending to funerals and visiting friends, will be neglected. Women can be relied on to take into account the whole family system when deciding how to fill their time.

We now look at the benefits and limitations of integrating biomass energy conservation activities into rural development programs.

² Moreover, in the same study it was shown that while more than sixty percent of farmers in a certain area were women, only ten percent of agricultural extension personnel were female and about the same percentage of women were present at extension meetings. Similar statistical relationships have been observed in other parts of Africa.

Economic impacts

If women are able to save time in one area of their daily work, they will invest it in productive activities in another area.³

In a village in the Muranga District of Kenya, several women formed a group to acquire the Maendeleo ceramic liners and learn how to build the stove. When every woman had a stove, the women decided to stay together and tackle another serious problem, access to clean water. A few months later on their next monitoring visit, project staff found that most houses in the village had self-built clay water tanks. On enquiry they were told that the women's group had learnt of a man in another town about 200 miles away who was skilled in building water tanks. They saved shilling by shilling and sent one of their members to bring the artisan to their village to teach them how to build water tanks. After experiencing success in building their stoves, they had the courage to find new solutions to other problems themselves – which is what development is all about.

Substantial time savings accrue from using energy-saving stoves and efficient kitchen management practices coupled with on-farm tree planting for fuelwood. In an agricultural economy, this “extra” time is usually invested in subsistence or cash crop production. More land is tilled, more vegetables grown, more trees planted. This improves the economic situation and increases food security for the whole family.⁴

The introduction of household energy conservation programs in rural areas also increases job opportunities for women and men outside of agriculture. These include stove building as an artisanal profession and making use of the extra time saved to start other income generating activities such as chicken or rabbit raising, which also improves the protein diet, or food processing, or establishing a tree nursery and selling the seedlings. In the Women and Energy Programme (WEP) in Kenya more than 300 women's groups started their own tree nurseries, planted the seedlings on their farms and sold extra seedlings to neighbors. At one time there were over twenty production centers for ceramic stove liners throughout the country with hundreds of women and men earning extra cash by making liners and as stove building artisans.⁵

Where fuelwood is a commercial commodity, which today is the case even in many rural areas, efficient use of fuelwood directly saves money for households. This money can then be used for other productive purposes. At least this is the case when women benefit directly from the savings. Savings of up to fifty percent are easily within reach of an

³ The information in this section comes from unpublished case studies and the author's personal experiences in GTZ-supported household energy projects.

⁴ A. Klingshirn, “Improved cookstoves as focal points of development processes”, GTZ/GATE, February 1992

⁵ Liner production in Kenya in 1994, at the end of the project, was estimated at about 40,000 per year; by 1999 it had dropped to about 12,000-14,000 per year on a sustainable basis. No post project assessment has been carried out on the tree nurseries.

efficiently managed household. Depending on the type of technology disseminated, payback periods of between three weeks and two and a half months have been calculated in a number of programs. Rates of return or net benefits over a period of three years for individual households in Niger, Mali and Burkina Faso range between 1,590 and 4,800 percent. In Kenya a payback period of 72 days (compared with a service life of 1095 days) was calculated. On a national scale, the program costs of the WEP in Kenya over 10 years averaged the annual savings at the end of the programme.⁶

Environmental impacts

In a well-integrated concept, reducing fuelwood consumption through the use of efficient technologies and increasing fuelwood production by planting the right type of leguminous multi-purpose trees contributes to reducing the rate of deforestation, while at the same time producing animal feed, controlling erosion, improving the quality of the soil, and generally halting land degradation and securing long term productivity. Where deforestation has already reached a stage where dung is being burned, this trend can be reversed in the medium-term and dung can again be used as fertilizer. Some rural development programs may already include such environmental concerns, but if an energy conservation component is included, the complementary character and focus on women becomes more easily apparent.

Biomass energy conservation (efficient use + tree planting) impacts directly on the everyday life of the whole rural family and is a powerful factor in raising awareness of the need to protect the environment at the individual household level. When an individual feels the direct impact on their own family and the local environment, it is a shorter step to environmental awareness at a more global level. This effect is enhanced when educational institutions are included in awareness raising activities.

In the Kagera Environmental Project (KEP) in Tanzania, a secondary school became interested in participating in environmental awareness creation activities carried out by the project. With initial support from the project, the school formed science, debate and theater clubs, composed songs, planted various types of trees in the school compound, learned the trees names and properties and analyzed the role they played in the environment. With the support of the local public radio station, they held public debates on relevant themes, such as the tradition of lighting bush fires, looking at the origin of such traditions and the effects they had on the wildlife and tree cover. In the meantime other schools in the project region have started their own clubs and the district education office has requested that the primary schools be included in this awareness raising effort with the argument that primary school students are more likely to relate their experiences to their parents. Schools now play an important role in awareness creation activities in the project region.

⁶ Habermehl, Helga, Micro- and Macroeconomic Benefits of Household Energy Conservation Measures in Rural Areas of Kenya, Household Energy Programme, GTZ, Eschborn 1994

Health impacts

Where people cook inside, the most significant health concern is indoor air pollution. Although it is difficult to isolate cause/effect factors, enough studies have been conducted to suggest strong evidence for causal relationships and compounding effects. These include acute respiratory infection in children, upper respiratory tract infections in adults, and negative health impacts on pregnant women and thus on births. Other negative health effects related to cooking are children burned by open fire, mothers worn out from carrying heavy loads of fuelwood over long distances, and nutritional deficiencies arising from fewer warm, healthy meals being cooked when fuel is lacking.⁷

Dr. Margaret Kinyanjui of the University of Nairobi⁷ studied indoor air pollution in 400 rural households in Kenya that use energy-saving stoves and efficient kitchen management practices. This study showed that the incidences of acute respiratory infections in children under 5 were reduced from 59% to 23% and in mothers from 38% to 14%. Compared with households using traditional technologies, conjunctivitis in children was reduced from 41% to 12% and in mothers from 12% to 4%. Kinyanjui's findings compared favorably with those of Mrs. Amy Mutere, who had earlier studied the CO emissions in rural kitchens and found that the incidences of respiratory tract infections were reduced significantly when women used efficient stoves. These are significant health impacts, which in themselves would justify widespread implementation of household energy conservation measures.

Improved health resulting from successful household energy interventions also impacts on the productive labor capacity of rural households. The argument here is that healthy people are more productive, and that high productivity improves chances of breaking the vicious cycle of poverty.

Negative health effects, on the other hand, reduce the working power of women, children and sometimes even men, or they absorb women's time since they have to care for sick children. This situation is especially serious in the case of women-headed households, which, with the rising rate of urbanization, are on the increase. How, one has to ask, can rural development projects expect to be successful unless these serious problems are addressed? Since efficient household energy conservation measures improve health and economic opportunity of rural households, they should be considered investments in human capital.

Socio-political empowerment

When household energy conservation is part of a rural development program, women automatically come into focus. In the process, women acquire organizational, technical and management skills to participate in the whole development process. A prerequisite for this kind of socio-political empowerment is that they live in a healthy environment

⁷ M. Kinyanjui, University of Nairobi, "The influence of improved stoves on acute respiratory infection, conjunctivitis and accidental burns, 1995

and are set free from time consuming daily tasks such as fuel and water collection and the like.⁸

In the Women and Energy Program in Kenya, for instance, the agricultural home economists reported that in Murang'a District, women would come regularly to extension meetings and participate in new agricultural practices and learn new technical skills only after they had energy-saving stoves and managed their homes efficiently. In fact, where some husbands previously had forbidden their wives to attend such meetings, they now urged them to attend. At a later stage, these positive experiences led women to become more vocal in local community meetings and local politics; in other words, women were able to develop self-initiative and self-confidence.

Household energy conservation programs help to strengthen the organizational capacities of women. In the two districts of Meru and Murang'a in Kenya, 30 women's groups organized themselves solely for the purpose of participating in household energy technology innovation activities and acquiring such technologies; later these groups stayed together and on their own initiatives started other development activities such as roofing their houses with metal sheets, guttering their roofs for water collection and building water tanks. Hence household energy conservation activities are a good mechanism for changing people's (and especially women's) attitudes about their own capacities, since they have the experience of improving their own lives through their own skills.

Since household energy is a cross-sectoral issue, household energy programs lead to further cross-sectoral cooperation. Agricultural extensionists, home economists and nutritionists, foresters, community development workers, basic health specialists, teachers and religious leaders all are challenged to contribute their specific expertise and to cooperate in a common effort to assist rural communities improve their living conditions. Where the need for cooperation grows from real life experience, this is usually not too difficult to translate into practice.

Difficulties may arise, however, at the higher policy level. Questions of legitimacy, power, prestige and ultimate financial responsibility, all play a role in hindering successful cooperation. This is an area where external development assistance can contribute by sensitizing decision makers on the need for cooperation. As indicated in the introductory section, household energy conservation measures serve as good examples to demonstrate this need.

⁸ A. Klingshirn, "Improved cookstoves as focal points of development processes, GTZ/GATE, 1992. Another aspect that was frequently mentioned to the author was that there was less quarreling in the families and more social cohesion in the community because with an efficient stove there was less borrowing or stealing of fuelwood. Women also appreciated that they had more time to look after their children and chat with neighbors. Old people reported that they felt less dependent on the young who normally have to carry fuelwood for them. This also reduced tensions in the extended family.

In the above sections, we have seen that household energy conservation brings significant economic, environmental, health and socio-political benefits. What are the extra costs when a household energy component is included in a rural development program and what is the payoff? Obviously, costs will depend on what is already available in specific programs and what partner organizations are willing to contribute to this effort, but past cost-benefit analyses have shown that, given a variety of different project costs, the rates of return have been exceptionally high. Cost-benefit analyses of two large-scale dissemination programs in Mali and Kenya (Habermehl, 1994) showed economic savings at national level of millions of dollars per year.⁹ Since synergy effects (e.g. erosion control, health factors, income generation, skills development) will occur in rural development programs, these rates of return are even higher.

Practical Implications

The simplest and most promising approach to integration of household energy components into rural development programs is to include them at the very beginning when the community first plans its activities. In this case the normal participatory planning procedures can be followed and the community will have to look at a number of extra questions surrounding the *status quo*, such as

- the energy situation in terms of a rapid energy assessment
- supply and demand of fuelwood
- structure and size of the family
- cooking and eating habits
- technical aspects of the existing fireplace
- coping strategies already employed
- the existing status and structure of the production of innovative technologies
- available local skills and materials
- dissemination and extension structures
- political frame conditions.

Depending on the outcome of this rapid appraisal, more detailed studies may or may not be necessary. Often the people themselves or local NGOs have already tried to improve on the efficiency of traditional technologies. In this case it will be necessary to assess the degree of efficiency according to comparative and accepted scientific standards. Where the outcome of this assessment shows that serious adaptation and development work is still required, it is worthwhile to look for a specialist in the region (or, if no one is available, externally) whose job is to train the local artisans to assess and adapt the existing technologies to people's needs.

⁹ Calculated in terms of shadow prices of fuelwood on the local markets. Had the countries opted for substitution with kerosene or gas, the calculated savings would have been 6 to 10 times higher.

Most rural development programs are *per se* multi-faceted, and implementing agencies often are hesitant to add another component to an already complex program. It is our contention that, while extra activities have to be taken up, they complement and strengthen on-going activities and existing implementation structures can be used. Coming back to the statement that there will be greater gender equity with a household energy component, there is every reason to expect that the total input for dissemination activities will not be significantly higher than without this component because women will be able to contribute much more of their time to rural development activities. Care has to be taken, however, that the activities are well integrated into the whole household system, the right measure of technical support is organized and responsibilities are clearly defined.

Household energy conservation is not, however, an activity that can be added without giving it special attention. There are cases recorded (Clasen-Loeprick, 1997) where misjudgment in this respect resulted in failure, because the dissemination of inefficient and inappropriate technologies and strategies brought costs and disappointment to the people. Once people have had such an experience, it is difficult later on to overcome negative attitudes.

This article draws on over fifteen years of the author's personal experience plus studies in the household energy sub-sector to argue for integration of biomass energy conservation into all rural development programs, provided household energy conservation is a felt need defined by people themselves in the program area.

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