FAQs

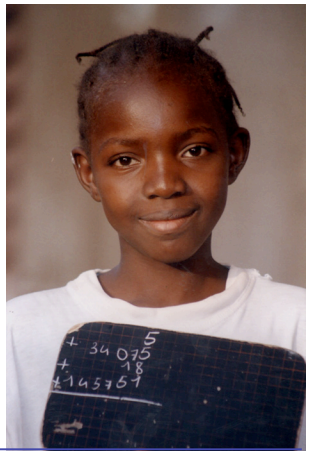
Frequently Asked Questions

HOW DO RURAL ENERGY SERVICES REDUCE POVERTY ?

FREQUENTLY ASKED QUESTIONS ABOUT THE MULTIFUNCTIONAL PLATFORM

March 2005.

"Approximately one quarter of the MDG target of a 50 percent reduction in the incidence of poverty could be achieved by introducing the multifunctional platform."



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A. THE ENERGY–POVERTY TRAP

1. What is the role of rural energy services in poverty reduction?

Poverty is multifaceted and circumstantial, both physical and social. But at the most fundamental level, it means being unable to achieve basic physical well-being. The most common way to measure poverty is based on the minimum caloric intake that provides humans with the energy needed for a normal life. Consumption poverty reflects the unavailability of that amount of food, and income poverty (for those who do not cultivate for themselves) reflects a lack of money to buy that amount of food.

If all of an individual's work energy goes into simply providing her/himself with calories at or below that minimum intake, s/he is blocked and finds it difficult to move out of poverty. In addition, humans need energy for other survival tasks besides just obtaining food, for example, shelter provision and social interaction.

In many rural areas of poor countries, human energy is the only energy source, sometimes supplemented by traction animals. Using human energy—largely devoted to three daily tasks (food production, food processing and cooking, and fetching water)—means that many tasks are performed more slowly than with mechanical energy, and meeting basic survival needs can occupy the whole day.

These two constraints—the available human energy and the amount of time needed for basic survival tasks—give rise to **the energy-poverty trap**. The daily necessity of performing time- and energy-intensive tasks to ensure survival can keep rural populations in a poverty equilibrium with no prospect of human development.

In these circumstances, a principal challenge for poverty reduction and human development is the provision of rural energy services. The most urgent services that mechanical and electrical energy can provide—as determined by rural populations themselves—are food processing and potable water. Energy services save both human energy and time, and create capacity for income generation, poverty reduction, and human development.

2. How are rural energy services linked to the Millennium Development Goals?

Rural energy provision breaks the energy–poverty trap. It thus contributes directly to meeting Millennium Development Goal (MDG) number 1—reducing the incidence of poverty by half by 2015 (elaborated in question 9).

Also, as is shown in question 10, rural energy provision contributes to MDG 2 (primary education), MDG 3 (women's empowerment), MDG 4 (reducing child mortality), MDG 5 (maternal health), MDG 7 (rural potable water sub-goal), and MDG 8 (rural youth employment sub-goal).

In effect, rural energy provision has a cross-cutting impact on achieving the MDGs. While energy provision itself is not listed as an MDG target, energy services are essential to progress on many MDG goals and sub-goals/targets. It therefore needs to be explicitly addressed in rural development strategies. But it may not receive

adequate attention because no single sectoral ministry has clear responsibility for its provision, and no single sectoral ministry sees or reports on its numerous benefits.

Moreover, sectoral strategies tend to focus on energy supply (that is, inputs), whereas experience shows that the most effective rural energy strategies assure access to energy services in response to the perceived needs of each rural community. The parameters of the energy–poverty trap can vary among localities, which means that the nature of the energy services needed will vary. Some communities may need more electrical power for battery charging, while others may need more mechanical power for sawmilling. Some may need more cereal processing, others more vegetable oil pressing, and others may give priority to obtaining lighting. Thus a flexible and modular approach to energy service provision is advantageous.

The challenge is to link rural energy provision at the inter-sectoral micro level (which is the level of its reality and impact) to regional, sectoral, and national strategies to meet the MDGs. This will clarify the full development impact of energy services for the rural poor.

B. THE MULTIFUNCTIONAL PLATFORM : AN INNOVATIVE APPROACH TO RURAL ENERGY SERVICES

3. What is the multifunctional platform?

There are several ways to provide rural energy services. The options include electrical grid, stand-alone systems such as household solar power, and community-level mechanical/electrical power generators. The multifunctional platform (MFP) is an innovative and polyvalent form of the latter, based on a single power source. It is a decentralised and flexible way to provide mechanical and electrical power. It can be both an alternative and a complement to grid and solar energy.

The MFP responds quickly and flexibly to priority needs as identified by the villagers themselves, and liberates time for overworked rural women. It fosters positive social change and strengthens villagers' familiarity with machinery and business practices. It directly and measurably contributes to several of the MDGs.

The MFP is created around a robust 8–26 HP diesel engine (made in India or China) mounted on two rails and housed in a shed. The diesel engine itself has been widely used in West Africa for decades. The engine provides belt-driven energy, to which up to a dozen mechanical and electrical modules can be connected; this is its "multifunctionality." The modules are locally designed and built using material and parts easily available.

Modules are chosen by villagers according to their own needs. These can be grouped as (i) grinding and husking mills and vegetable oil presses for agricultural processing, (ii) welding and sawmilling equipment, (iii) electrical generators for battery charging and for village mini-distribution networks (up to 250 lightbulbs), and (iv) water pumps with the possibility of potable water distribution.

4. How is the MFP operated and used?

The MFP had its origins in the search for a way to lighten the work load and energy expenditure of rural women and girls. It was therefore seen as logical that it be owned, managed, and operated by village women's groups. Members of the group receive training on its mechanical attributes, and in basic accounting and literacy as necessary. They schedule its use and set the charges for using the various modules.

The MFP is installed, maintained, and repaired by local technicians, invariably men, who are given specific training as fitters, welders, electricians, and general mechanics.

Customer demand for different services, that is, use of the various modules (see question 3) shows seasonal patterns, and the MFP is able to respond flexibly to the varying rhythm of rural life. The diesel engine can also run on a local oilseed without any mechanical adjustment, and the vegetable oil module can crush these seeds to provide fuel on the spot (see question 15).

Typically the MFP runs about four hours per day, in an early morning period and a late afternoon period. MFPs have an average of about 200 regular clients, nearly all women, and the greatest demand is for processing agricultural produce. (The average village size in Mali with an MFP is around 1,100 persons, of whom about 200 are economically active women. In view of the average household size, this basically means universal access.)

5. What is the MFP's impact?

The reality in poor countries is that rural areas, where typically 70 to 80 percent of the population (and up to 90 percent of the poor) live, have practically no access to modern sources of energy. Contrary to common belief, rural populations do not have an abundant supply of human time and energy; rather, the opposite is true. Notably, women have no free time. The rural economy is therefore typically caught in the energy-poverty trap described in question 1: it is unable to raise living standard without access to non-human energy, but the resources needed for access to non-human energy are unavailable because of poverty.

The MFP unblocks the energy–poverty trap. It is economically successful, a force for social change and modernisation in villages, and a significant contributor to achieving the MDGs. Studies of experience to date in Mali show that the **MFP by itself could contribute about a quarter of the progress needed to cut poverty by half by 2015**. This applies even when, as in most of West Africa, 60 to 70 percent (and nearly 80 percent in rural areas) live below the poverty line. The MFP's specific demonstrated benefits on several of the MDGs are described in questions 9 and 10.

Flowing from experiments beginning in the late 1980s, and piloted in its present form in the mid-1990s, the MFP is now installed in about 450 villages in Mali, as well as in 50 or so additional villages in Burkina Faso, Guinea, Ghana, and Senegal. Most are in Mali because this is where the development of the MFP took place and its impact is already being assessed in the many studies available; the principal studies are listed in the Annex to this document.

The challenge now is to rapidly scale up use of the MFP in order to fully benefit from its potential macro-impact on the MDGs. The first target for scaling up is Mali, while simultaneously launching it in several countries of the Economic Community of West African States (ECOWAS) and laying the foundations for its introduction in East Africa (see questions 19 and 20).

6. What is "the MFP approach"?

Energy service provision needs attention at the micro, sectoral/regional, and macro levels of development strategy (see question 2). In poverty reduction strategy papers (PRSPs) and other instruments, and at national, regional, and sectoral levels, energy services need to become an identifiable vector for development and for achieving the MDGs. Thus it is important to integrate energy service provision into regional, sectoral, and cross-sectoral strategies, and to explicitly recognise it in PRSPs and in MDG monitoring.

This three-layered approach—micro, sectoral/regional, and macro—is now being piloted as the conceptual underpinning for scaling up rural energy service provision, that is, through using the MFP. Furthermore, the current process of MFP diffusion and scaling up will increasingly involve NGOs and the private sector.

Energy from the MFP—compared to alternative sources—is accessible to poor villagers who are often beyond the reach of conventional energy programs. It particularly benefits women and girls. Compared to energy from alternative sources, the MFP gives a broad range of benefits (see questions 7, 8, 9, and 10). Not only is there a direct impact on the poverty levels of the rural poor; there are also significant, and often measurable, impacts on health, education, gender equity, and potable water supply, as well as on agricultural production, rudimentary industrialisation, and rural–urban migration.

7. Why adopt an old-fashioned technology when modern options are available?

Compared to other options, the MFP frequently presents a particularly appropriate fit with the conditions of the rural poor. The technology is robust and its elements and spare parts are widely available. Because of its modular design, it is easy to operate, maintain, and upgrade. It is generally affordable both as an investment and to its clients. It creates expanding business opportunities that can be taken up by the rural poor.

This is not to say that it is the single solution: all options should remain open and be assessed on their merits. For example, both electric grid expansion and solar power need to be part of the energy policy menu, in order to most effectively address the development needs of multiple economic and social groups. And single-purpose machines, for example, motorised grinding mills, will certainly continue to be used.

Studies in Mali show that solar power, in providing similar services, costs about twice as much as the MFP and presents few economies of scale—but technological and production advances may change this. In addition to its initial expense, solar power suffers from low torque provision and cannot therefore provide the same range of

services as the MFP (effective agricultural processing, for example). But it is a simple and proven way to provide power to individual households, schools, clinics, etc.

At a similar level of service as the MFP, rural electrification is about half as expensive again as solar power, although it has rapidly rising economies of scale. But it can be difficult to justify the cost-effectiveness of extending rural electrification to resource-poor dispersed communities.

The MFP represents a technological "ladder climbing" approach to rural energy rather than a "leapfrogging" approach. The MFP's modest capital cost avoids technological lock-in and leaves much flexibility to adopt more modern approaches, higher up the technological ladder, as and when feasible. It is a particularly effective, even if transitional, response to the rural energy deficit in many of the poorest countries in the next few decades.

Where rural electrification is relatively advanced, as in Senegal and Ghana, a mixed approach—with the MFP, solar power, and rural electrification each serving different types of customers—is *prima facie* interesting and can be piloted. Such efforts are under way in Senegal.

8. What is the dynamising role of the MFP?

The MFP has one extremely important advantage: by virtue of its technical characteristics and its manner of use, it is a force for social change and changing mentalities. The MFP requires organisation, structured group collaboration, new socioeconomic roles and relationships, minimal literacy, and arithmetical skills, and it promotes familiarity with mechanics and repair/maintenance—all essential in the "modern world." The MFP, through its diverse and positive impacts, provides the incentive to develop these modern skills.

C. THE MULTIFUNCTIONAL PLATFORM AND THE MDGs

9. How does the MFP promote the MDG of reducing poverty by half by 2015?

Based on studies of the approximately 450 MFPs so far installed in Malian villages, the economic impact of national coverage—serving some 5,000 villages—would be to meet **about one quarter of the MDG target of a 50 percent reduction in the incidence of poverty.** Basically the MFP more or less eliminates the poverty gap for its clients, who nationally represent some 11–15 percent of the population below the poverty line. The MFP is an effective vehicle for poverty reduction.

At an individual level, the additional income for economically active women in Malian villages with an MFP is estimated at about $44 per year—in a country where the average annual rural income is estimated at about $122, GDP per capita is around $300, and nearly 80 percent of the rural population lives below the poverty line.

The expansion of MFPs to 5,000 villages in Mali would probably cost about $80–$90 million, a figure subject to further refinement through studies now under way. This covers all elements, including capacity building, specific training, organisational

support, and the platforms themselves (the last being jointly financed by villagers and public/private funds). If village-level electrical and water distribution were included for all 5,000 villages, this would add some $180 million to the cost .

An MFP is a profitable rural business, generating enough revenue to cover its running costs and thus avoiding dependence on the continual availability of public financing. Preliminary estimates suggest that the direct gains to its primary users will be close to $50 million per year if 5,000 villages are covered, which compares very favourably with the initial cost of $80–$90 million.

The MFP is income-generating in several ways. Most directly, the women's group operating the MFP earns cash income from clients. Its builders and materials suppliers; the male mechanics maintaining and repairing the MFP; and the welders, electricians, and woodworkers using it, all earn cash. Local entrepreneurs, shopkeepers, and traders all profit from this strengthened monetisation of the rural economy.

Most importantly, the MFP liberates village women—and especially girl children—from the daily time-consuming toil of pounding cereals and fetching water. This creates new discretionary time (from 2 to 6 hours per day, see question 10) and allows them to pursue new income-generating activities such as market gardening and trading agricultural produce processed by the MFP.

Better health status directly affects poverty reduction, and the discretionary time provided by the MFP means that women can pay more attention to their own and their children's health needs. Evidence for this comes from attendance records and morbidity statistics at ante-natal clinics and health centres. And there is clear evidence of gains in agricultural productivity in villages with the MFP (from a combination of the services it offers), leading to better nutrition and sometimes leading to cash exports to towns and deficit regions, with poverty-reducing impacts.

In a number of villages, profits from the MFP have been used to pay for improvements in schooling, health services, and water supplies, which in turn reduces the burden on government to provide these.

10. What about the other MDGs?

There are identifiable impacts on MDGs 1 through 8. Beside poverty reduction (MDG

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