

**EUROPEAN COMMISSION**



**The role of energy services in the  
health, education and water sectors  
and cross-sectoral linkages**

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## 1. INTRODUCTION

This report has been prepared as part of the ENABLE project, whose full title is "*Building capacity in renewables in the health, education and water sectors to help meet poverty reduction targets in sub-Saharan Africa*"

ENABLE is supported by the European Commission's Directorate General for Energy and Transport (DG TREN), through the Intelligent Energy Europe (IEE) programme and its COOPENER funding stream. The project commenced in January 2005 and is due to be completed in June 2007.

The COOPENER actions of the IEE programme aim to support and stimulate the activities of the European Energy Initiative (EUEI) for Poverty Eradication and Sustainable Development. The Coordinator of ENABLE is IT Power (UK) and the European partners are Stockholm Environment Institute (Sweden) and Transénergie (France). The partners in sub-Saharan Africa are IT Power East Africa (Kenya), TaTEDO (Tanzania), QuinTsens (Senegal) and ASER, the Rural Electrification Agency of Senegal.

The overall objective of ENABLE is to develop awareness of the opportunities and limitations to use renewable energy to meet poverty reduction targets in the sectors of health, education and water in East Africa. The project aims to strengthen capacity to identify and assess sustainable energy strategies which contribute to the sectors objectives.

The activities of the project are divided into nine work packages. This report is a deliverable under Work Package 2: "Establishing the role of energy in the national Poverty Reduction Strategies", and provides an overview of the role that energy services play in achieving objectives in the health, education and water sectors and identifies cross-sectoral linkages that if captured have the potential to accelerate increased access to modern energy services.

## 2. THE ROLE OF ENERGY SERVICES IN THE SOCIAL SERVICE SECTORS IN EAST AFRICA

Although energy poverty is rarely the first driver considered with respect to social sector objectives, it is a crucial underlying obstacle for achieving many of the health, education and water supply improvements necessary for sub-Saharan African countries to achieve the Millennium Development Goals (MDGs).

The linkages between energy services and social sector improvements and those between the social sectors themselves will be explored in this report.

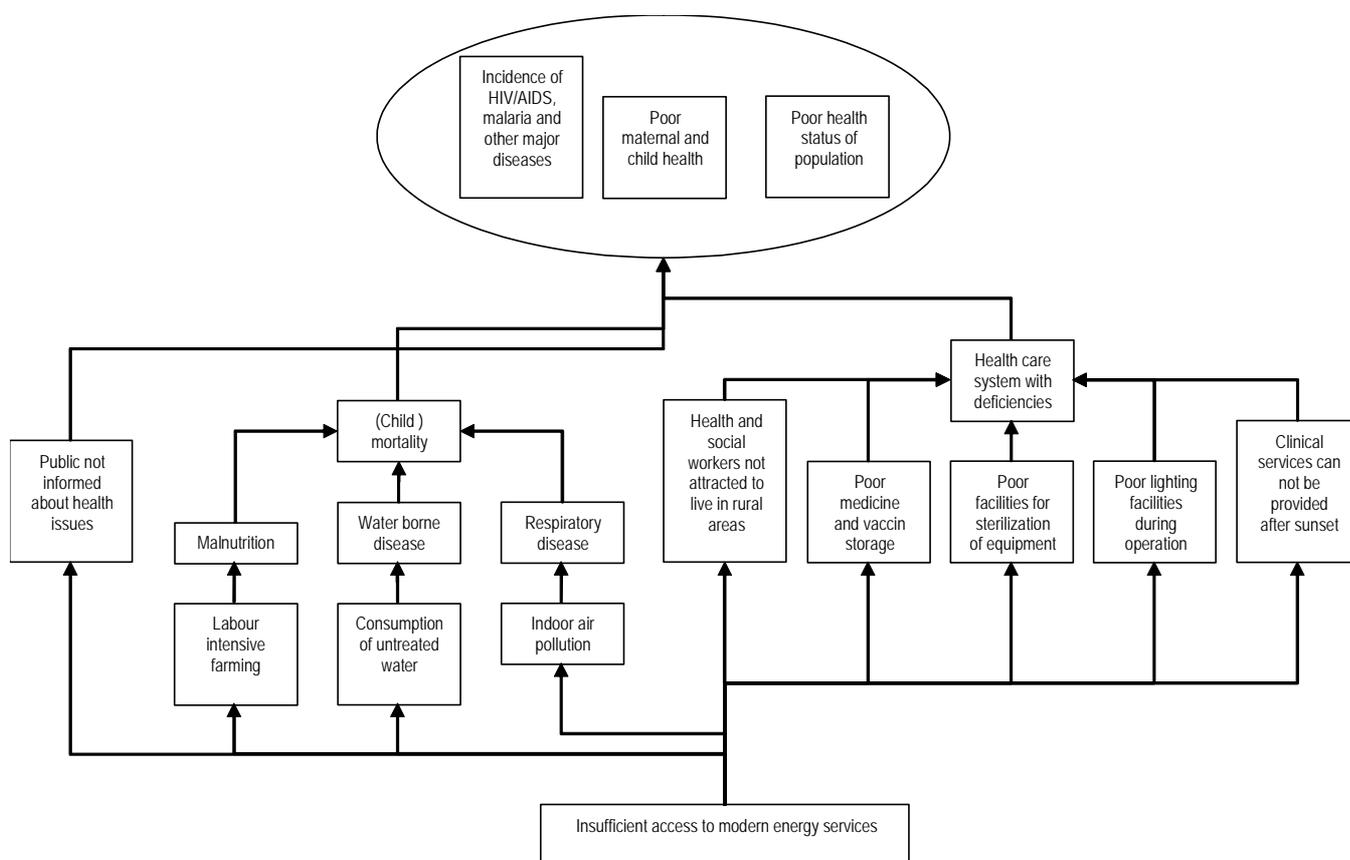
### 2.1 The Role of Energy Services in the Health Sector

Energy is essential in the provision of health services. There are certain appliances providing a range of services in health facilities that can not be operated without energy. These include medical refrigerators, sterilizers, lamps, cookers, suction machines for deliveries, incubators, microscopes, centrifuges, mixers, X-Ray viewers, etc. Many rural health facilities in Eastern Africa are limited in their ability to deliver

quality health services, partly due to a lack of appropriate, affordable and accessible energy services. Figure 1 provides an overview of some of the relationships between energy poverty and unattained health sector objectives.

Some of the relationships are quite direct and relate to the provision of services at a clinic or a health centre. Others, such as consequences of labour intensive farming and poor access to clean water, are more indirect or fall outside of what is strictly considered the domain of the health sector, and yet these relationships also have an impact on the health of the population.

In fact Figure 1 starts to show not only the linkages between the energy sector and health sector objectives but also the linkages between the health sector and education, water and agriculture sectors.



**Figure 1: Relationships between energy poverty and unattained health sector objectives**

Energy poverty at the level of the institution delivering health services results in problems such as:

- Poor storage facilities for vaccines and medicines requiring refrigeration;
- Poor facilities for sterilization of medical tools;
- Poor lighting conditions for performing operations;
- Inability to provide clinical services after sunset;
- Difficulty in deploying health officers in remote rural areas;
- Inability to power laboratory equipment to diagnose patient's disease;

- Poor ability to communicate with medical specialists or to call for transport to a health facility with a higher degree of specialisation;
- Limitation to traditional cooking facilities – resulting in inefficiencies, poor air quality and possible inadequate food intake of patients.

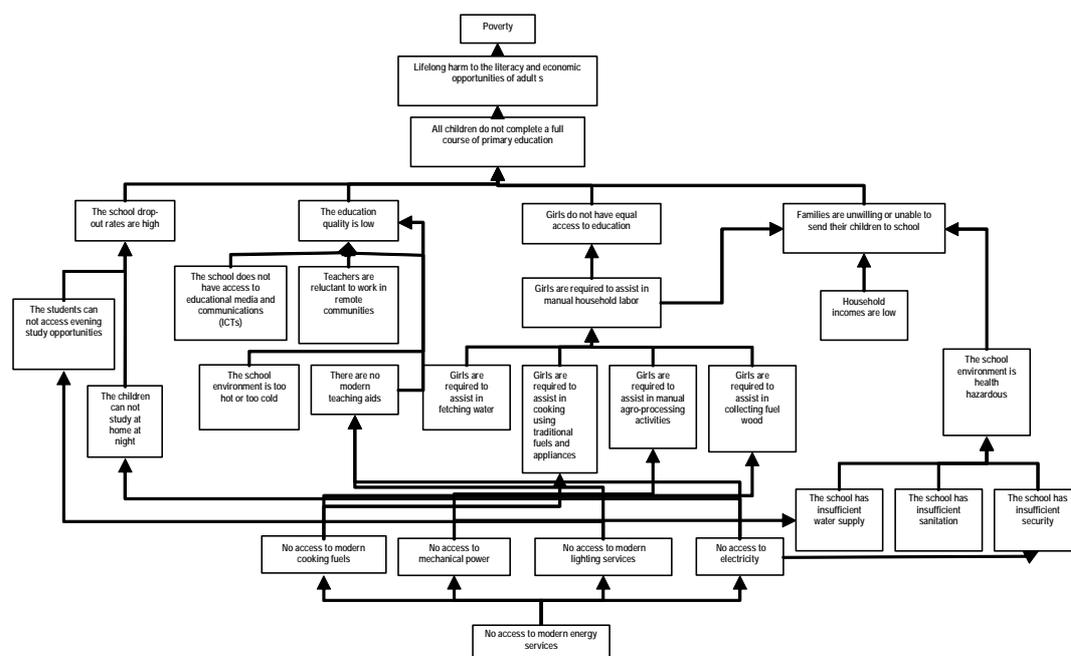
Related to the capacity to provide clinical services, but typically outside the physical structures where clinical services are provided, is the ability to attract and retain health workers and social workers to live in rural areas.

This has many causes, some of which are not energy related, such as the ability to provide an attractive salary or a premium for working under rural conditions. But there is also a link to energy access, in that professionals are more reluctant to live in rural areas where there is no access to electricity and other modern fuels for cooking, communication and leisure activities, amongst others.

## 2.2 The Role of Energy Services in the Education Sector

Energy services have roles to play in the provision of both primary and secondary education, as well as vocational education services. There are many different services provided by the education sector, which cannot be delivered without access to energy.

Basic services that are part of delivering education include student learning, typing, photo-copying, laboratory practical tests, operating audio-visual equipment, security lights, water pumping, domestic science studies, cooking and boiling, laundry, transport and lessons preparations. All these services require energy and quality of services provided depends on the form of energy sources available and ability to pay the energy bill to get the services. More advanced services which also require energy are access to the Internet, computer laboratories, libraries and transport for field trips, amongst others.



**Figure 2: Consequences a lack of energy services in meeting education sector objectives**

Figure 2 provides an overview of some of the consequences a lack of energy services can lead to in not being able to fulfil education sector objectives. As with the overview

of the health sector in the previous section, some of the relationships are apparent and directly relate to the functioning of a school. Other relationships are more indirect and fall outside of what would traditionally be considered the domain of the education sector.

The issues relating to the nexus of education and energy poverty can also be grouped into constraints at three levels: the level of the physical structures where educational services are provided, at the level of the teachers and staff providing the education and at the level of the household.

Energy poverty at the level of the institution delivering educational services can result in problems such as:

- The school does not have access to educational media and communications which can have a negative impact on the quality of the education and the rates with which students complete their education;
- The teachers do not have ability to use modern teaching aids and easy access to the latest information in their field – potentially affecting quality of education and ability to attract professional staff;
- Students have limited opportunities in studying in the evening, – potentially affecting the study results and rates with which students complete their education;
- A schools with poor sanitation, water supply, cooking and lighting facilities presents an environmental health and security hazard that can affect parents willingness to send children to school (especially for girls and especially for boarding schools) and the quality of the learning.

Related to the capacity to provide educational services, but typically outside the actual physical structures of the school building, is the ability to attract and retain trained teachers to live in rural areas. This has many causes and perhaps the most important is the ability to provide an attractive salary or a premium for working under rural conditions, rather than energy related issues.

But as for the health sector, the link to energy is that professionals are more reluctant to live in rural areas where there is no access to electricity and other facilities, some of them requiring an energy input.

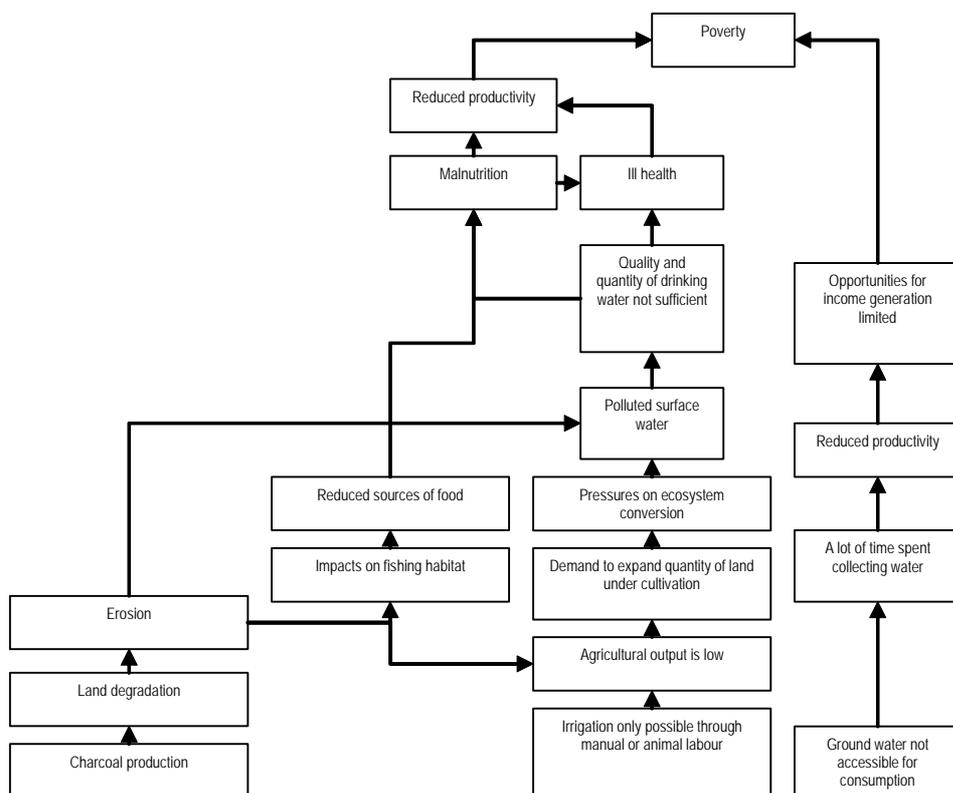
### **2.3 The Role of Energy Services in the Water Sector**

The water sector requires energy to pump water from the sources; and to supply water to the end-users. Energy has a strong bearing, whereby without it, it is impossible to meet the targets set for water provision in rural areas of East Africa.

Figure 3 gives an overview of some of the relationships between energy services and delivery of water sector services. Access to modern energy services that can deliver sufficient quantities as well as adequate quality of water have an impact on many sectors including health and education (as we have seen above).

There is also an important impact on the opportunities to generate an income, principally through better irrigation for agriculture and pastoral activities which constitute a significant part of livelihoods for rural populations.

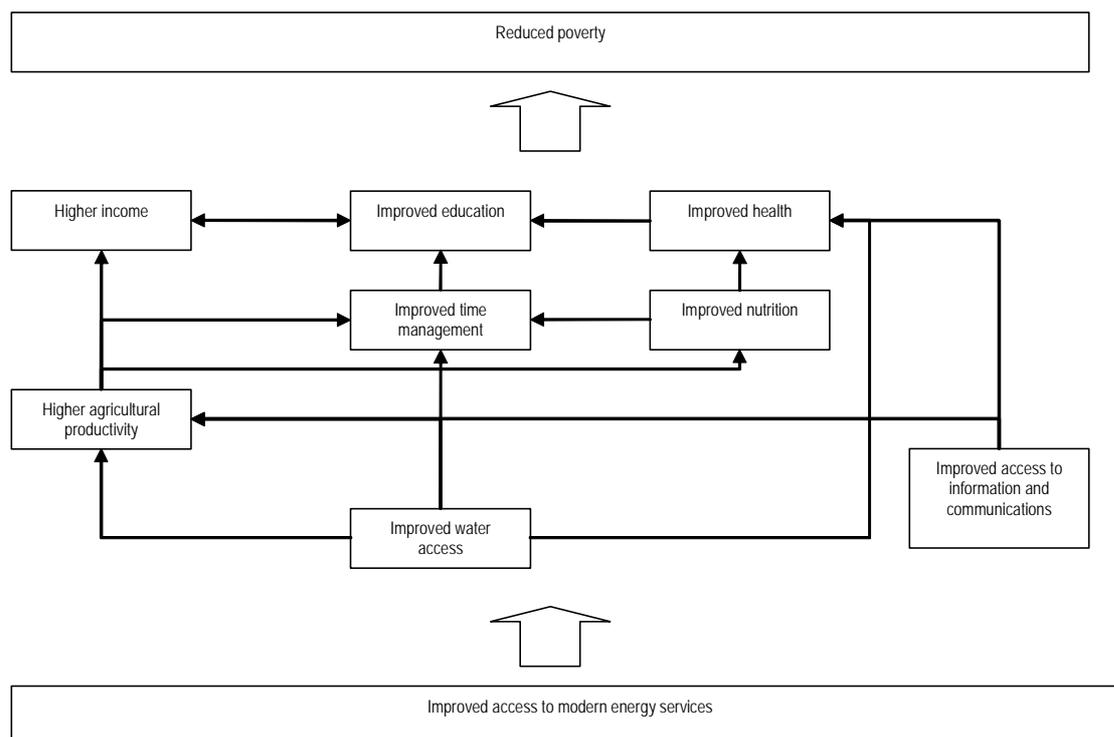
There can also be environmental impacts. Greater access to energy for water supply can have implications on the pressures put on ecosystems. Increased access to water as well as fertilizers can result in reduced pressure on other resources, such as land, for example as demand to expand agricultural production into new areas decreases as production from irrigated land increases. Some of the linkages between energy for improved water supply, agriculture, the environment and human health are illustrated in Figure 4.



**Figure 3: Relationships between the lack of energy services and services that can not be attained from the water sector.**

### 3. CROSS-SECTORAL LINKAGES

As illustrated in Figures 1 – 3, energy services not only contribute directly to improving the quality and quantity of services delivered within the health, education and water sectors, energy services also play important roles in improving efficiencies of other sectors. Furthermore, improvements in one sector have positive implications on other sectors. For example an improved health status in the population impacts positively on productivity which has positive implications on for example agricultural outputs and educational results. Figure 4 illustrates some of the important linkages and implications of improved access to modern energy services and the resulting positive cross-sectoral implications of such access.



**Figure 4 Cross-sectoral linkages**

There are other energy-health-education-water related linkages that can contribute to achieving social sector development objectives. Many of these are not traditionally regarded as the responsibility of the specific social sectors. However, their contributions to poverty alleviation are evident, as shown in the examples below:

- Labour intensive and inefficient farming systems due to a lack of mechanisation and low fertiliser inputs play a role in malnutrition, poor health, and low productivity and in some cases leading to the demand to expand quantity of land under cultivation and thereby threatening ecological systems. It is also related to the ability for children, and especially girls to have time to attend school. Energy has a role to play in both powering equipment used in farming as well as an important input in producing fertilizers.
- Processing agricultural products without access to modern energy services leads to a dependence on human and animal labour and traditional biomass energy. The efficiency with which agro-processing is carried out impacts on income generation, nutrition and health as well as the ability of especially girls to attend school.
- Lack of modern energy services make water treatment and water pumping more difficult and labour intensive. Consumption of untreated water is responsible for the spread of waterborne diseases. Access to water also impacts on agricultural productivity levels.
- Collection of water and fuel wood from distant sources means more time needed from children to contribute to these chores. Girls in particular often make a large contribution of their time to household chores which limit time

and opportunity to attend school and to study for their lessons if they do attend.

- Poor health among children in general, for example due to malnutrition or exposure to waterborne diseases, results in more time being sick and not able to attend school which can affect the rate with which students complete their schooling.
- Another area that can have implications on the health status of the population is the ability of the public to receive information about health issues via radio and television – appliances that require some form of power. Information and communications can also be important for income generation; farmers may be able to sell their products at a higher price and thereby increase their incomes if they have access to the right information at the right time on for example prices of agricultural products in the markets.
- Indoor air pollution caused by use of traditional fuels in inefficient technologies is a major cause of respiratory illness to the majority of rural people. Poor health among children in general result in more time being sick and not able to attend school which can affect the rate with which students complete their schooling. Poor health may also lead to reduced ability to be involved in farming or other income generating activities.

These are the most direct links between the social sectors and energy services. Above, a number links between the social sectors themselves were mentioned. As energy impacts and improves conditions in one social sector, this improvement in that one sector can impact other social sectors, even where energy services to those sectors are not as improved. The links between the social sectors are more indirect but they are still present. Some of these linkages between the social sectors as well as the links with the energy sector are summarized in Table 1.

The exemplified cross-sectoral linkages indicate that there are good reasons for coordinating and assessing energy service needs across sectors as well as identifying other non-energy related cross-sectoral linkages. In certain aspects this is already well defined such as the linkage between health and education and the inclusion of health related teaching subjects in the curricula. In other areas there is room for further exploring and exploiting the advantages of jointly coordinating energy service needs assessments and energy service delivery mechanisms across sectors.

**Table 1. Linkages between the social sectors themselves and with the energy sector**

|                                       | Health   | Education   | Water   |
|---------------------------------------|--|---|---|
| Impact of Energy on..                 | <ul style="list-style-type: none"> <li>- Vaccination storage</li> <li>- Medicine storage</li> <li>- Sterilization</li> <li>- Operations</li> <li>- Laboratory tests</li> <li>- Clinical services after dark</li> <li>- Communications</li> <li>- Attracting and retaining health professionals</li> <li>- Cooking facilities</li> <li>- Transport to facilities</li> <li>- Modern cooking and lighting → reduced indoor pollution → reduced respiratory diseases</li> </ul>                              | <ul style="list-style-type: none"> <li>- Teaching aids → improved educational quality</li> <li>- Lighting → evening study → improved study results</li> <li>- Lighting → security → girls attending school</li> <li>- Modern cooking fuels → reduced time collecting wood → more time to attend school</li> <li>- Attracting and retaining trained teachers</li> </ul>  | <ul style="list-style-type: none"> <li>- Improved water quality</li> <li>- Increased quantities of water available</li> <li>- Easier and more widespread access to clean water</li> </ul>   |
| Impact of better Health on...         |  | <ul style="list-style-type: none"> <li>- Children are sick less often and so are able to attend school regularly</li> <li>- Children are more alert and it is easier for them to concentrate in class</li> </ul>  | <ul style="list-style-type: none"> <li>- People are less fatigued if they have to travel long distances to collect water</li> <li>- Less incidence of diseases that might be transmitted by water</li> </ul>  |
| Impact of better Education on...      | <ul style="list-style-type: none"> <li>- People are more aware of diseases and how to protect themselves (particularly HIV/AIDS)</li> <li>- Mothers are better able to care for their children</li> <li>- More people educated so they can consider a career as a health professional</li> <li>- Infant and maternal mortality is reduced by educating girls</li> </ul>  |   | <ul style="list-style-type: none"> <li>- More people are educated to a level where they can build and maintain water supply systems</li> <li>- People are more aware of the dangers of a contaminated water and how to keep their water supply clean</li> </ul> |
| Impact of better Water services on... | <ul style="list-style-type: none"> <li>- Improved water quality → reduced water borne diseases</li> <li>- Reduced time collected water → reduced fatigue amongst women and children</li> <li>- Better water management can greatly reduce malaria mosquito breeding sites</li> <li>- Clean water improves effectiveness of anti-retroviral treatment for AIDS sufferers</li> <li>- Clean water means that formula milk can be used safely to prevent transmission of HIV from mother to child</li> </ul> | <ul style="list-style-type: none"> <li>- Less time spent collecting water, so children can spend more time in school and studying at home</li> <li>- Clean water available to children at school → safer environment and concentration in classes improved</li> <li>- Better cleaning and cooking services are available for students and staff</li> <li>- Easier to attract and retain trained teachers</li> </ul> |   |

### 3.2 Maximising benefits of cross sectoral linkages

As we have seen above there are strong linkages not only between improved energy services and better health, education and water services but also between the social sectors themselves. How can the benefits from these interactions be maximised?

Research in recent years has found some evidence that certain actions can give stronger improvements across the social sectors (and in other sectors also such as agriculture and micro-enterprise, but as these are not the focus of the ENABLE project, details will not be elaborated here). Some of these actions are mentioned here as

examples. These actions, combined with better access to energy for the social sectors, would accelerate improvements across the sectors.

### **Actions on governance and capacity building:**

In order for improved energy, health, education and water services to impact each other more effectively, there is a need for better governance and stronger capabilities within government institutions.

- District (decentralised) government must be strengthened with both financial and human resources;
- Capacity building and training must be provided for district government staff
- A large investment must be made in training of teachers and health professionals, staff retention in rural areas and professional development

### **Actions on including women:**

Women are usually the primary carers and providers for a family, but they are still routinely excluded from access to information, services and decision-making bodies. Women and girls need to be given more opportunities and greater equality.

- More women should be included in decision-making bodies, especially at the local level;
- There should be more systematic planning for measures that will achieve greater equality for girls, particularly in terms of access to education;
- Women's rights should be strengthened and upheld.

### **Actions on strategy development and monitoring:**

Strategic planning across different sectors at the central level will be essential to maximize benefits of cross-sectoral linkages. At the local level there is a need for better information collection systems and monitoring which will feed back to the central level.

- Central ministries to coordinate their actions and encourage donors to also provide coordinated aid programmes;
- Comprehensive strategies for delivery of services and for monitoring of results need to be developed;
- The issue of energy needs to be integrated into strategic planning in all the sectors;
- Strategies developed must ensure that the poorest people are included and will benefit;
- Better data collection systems must be developed to feed back information from the local level to central government and monitor the implementation of strategies.

These are some examples of actions that can be taken to tap into and maximize the benefits of cross-sectoral linkages. Each country will have to develop its own plan on how to proceed. The following section gives some suggestions on what the sectoral Ministries can do as a first step to maximizing the benefits of the linkages between the energy, health, education and water sectors.

## 4. PROMOTING INCLUSION OF ENERGY IN THE PRSPs

While the governments of Kenya, Tanzania and Uganda are all committed to alleviating poverty, the current national strategies (PRSPs) fall short of providing a convincing plan to provide energy access on a widespread basis. A review of the PRSPs of Kenya, Tanzania and Uganda (see Table 3) indicates that to some extent, (see Table 2) the PRSPs do elaborate on the role of energy in meeting poverty reduction targets but there is room for further elaboration and the development of concrete strategies. Some of the remaining challenges of the PRSPs are that they:

- Have a low emphasis on the linkage between energy and education, gender equality and health
- Emphasis is on energy supply rather than energy service
- Emphasis is on electricity rather than biomass
- Lack of explicit budgetary allocations

Current plans rely heavily on private sector energy services suppliers. At the same time, private sector actors face challenging competitive environments which limit their rate of growth and in rural areas where the majority of the population resides these businesses will have even less of an impact. Furthermore, the current approaches primarily focus on infrastructure investment rather than access to services. For example, investments in urban grid construction do not take into account the obstacle that up front connection fees pose – 61% of households have not connected to lines already at their doorstep.

A key constraint is that existing delivery models are not scaling up. Electricity distribution utilities are not connecting many urban households within reach of the existing grid. In other cases the most established delivery models can only reach a limited segment of the population within the next 10 years. Grid extension-based rural electrification programmes can only reach very well located or very economically developed communities, leaving about 85% of the remaining communities without access. In these cases innovation in new business models and technologies should be developed and supported.

There is a need of improving or adapting the sectoral planning of the three sectors (water, health and education) to incorporate energy into the planning, design, operations and development activities. This is only possible if the responsible ministries make concerted efforts to promote energy as key for poverty reduction, and not just grid-based electrification but all possible energy sources. Furthermore, the sector strategies need to clearly and explicitly elaborate on which energy services are to be prioritised and how they are going to be delivered to support poverty reduction targets.

| ENERGY LINK WITH NATIONAL DEVELOPMENT GOALS <sup>1</sup>   | Kenya  | Tanzania |      | Uganda |
|--|--------|----------|------|--------|
| Year of PRSP   | 2005   | 2000     | 2005 | 2000   |
| Is energy mentioned?   | Yes    | Yes      | Yes  | Yes    |
| Does energy have a stand-alone chapter in the document?  | No     | No       | No   | No     |
| Is energy discussed/mentioned at all in other chapters?  | Yes    | Yes      | Yes  | Yes    |
| Is energy recognized and discussed in relation to the following development aspects?   |        |          |      |        |
| Macroeconomic development (MDG 1)  | 2      | 2        | 2    | 2      |
| Reducing income poverty (MDG 1)  | 2      | 1        | 2    | 2      |
| Reducing hunger (MDG 1)  | 1      | 0        | 1    | 2      |
| Education (MDG 2)  | 0      | 0        | 1    | 1      |
| Gender equality and the advancement of women (MDG 3)   | 0      | 0        | 2    | 1      |
| Health (MDG 4/5/6)   | 0      | 0        | 1    | 0      |
| Climate change (MDG 7)   | 0      | 0        | 0    | 0      |
| Other environmental issues (MDG 7)   | 2      | 0        | 2    | 2      |
| International trade (MDG 8)  | 2      | 0        | 0    | 0      |
| Debt sustainability (MDG 8)  | 2      | 0        | 0    | 0      |
| Score <sup>2</sup>   | 0.55   | 0.15     | 0.55 | 0.50   |
| NATIONAL ENERGY PRIORITIES   |        |          |      |        |
| Which of the following expressions most closely describes the treatment of energy issues in the document   |        |          |      |        |
| Expanding investments into energy supply infrastructure in the country   |        | X        |      | X      |
| Improving access to reliable and affordable energy services for the poor.  | X      |          | X    |        |
| Accelerating transition to a more sustainable energy system  |        |          |      |        |
| Are the discussions on energy issues disaggregated per urban, peri-urban and rural?  | Yes    | No       | Yes  | Yes    |
| Does it explicitly prioritize the energy needs of the poor, rather than of the country?  | Yes    | No       | Yes  | Yes    |
| If yes, which needs of the poor are recognized?  |        |          |      |        |
| Electrification  | 2      | 0        | 2    | 2      |
| Mechanical Power   | 0      | 0        | 0    | 0      |
| Fuels for transport  | 0      | 0        | 0    | 0      |
| Modern household fuels for cooking/heating (LPG, Kerosene, etc)  | 1      | 0        | 2    | 2      |
| Management of traditional biomass  | 1      | 0        | 1    | 1      |
| Deployment of modernized biomass (such as biogas, gasification, ethanol etc)   | 0      | 0        | 2    | 0      |
| Deployment of renewable energy sources (such as solar, wind, etc) others   | 2      | 0        | 2    | 1      |
| Do they set targets/benchmarks to be achieved? For example, percentage access to electricity or modern cooking fuels such as LPG, efficiency, energy intensity etc. <sup>3</sup> | Yes    | No       | Yes  | Yes    |
| NATIONAL BUDGETS FOR ENERGY  |        |          |      |        |
| Is there an explicit and annual allocation for energy in the Mid Term Expenditure Framework (MTEF) in the document? <sup>4</sup>   | Yes    | No       | No.  | No     |
| How much an annual allocation for energy is suggested (aggregated across all energy interventions)? And, what is its percentage share within the entire national budget?         | 15.42% | N/A      | N/A  | N/A    |
| Out of the allocation for energy, what percentage is supposed to be from internal (national) revenues? And what percentage is from external (ODA, inc. lending)?                 | N/A    | N/A      | N/A  | N/A    |
| Does it provide any disaggregating, such as budgets for rural vs. urban; electrification, fuels, biomass etc. <sup>5</sup>   | Yes    | N/A      | N/A  | N/A    |

Explanation: 2- mentioned and elaborated on, 1 - mentioned but not elaborated on, 0 - little to no mention

**Table 2 The energy-poverty nexus in the East African Poverty Reduction Strategy Papers**

<sup>1</sup> The analysis for Kenya and Uganda come from Energizing Poverty Reduction – A Review of the Energy-Poverty Nexus in Poverty Reduction Strategy Papers, Minoru Takada and Ndika Akong Charles, UNDP November 2006. The analysis is updated by the ENABLE team with information from Tanzania's National Strategy for Growth and the Reduction of Poverty (NSGRP) adopted in June 2005

<sup>2</sup> In the review by UNDP (2005) the average score for Africa was 0.37

<sup>3</sup> Comment Kenya: With regard to electricity, the aim of the government is "to reach a penetration rate of at least 40 per cent of the rural population by 2020 from the current 4 per cent." The document also discusses objectives for the improvement of petroleum and new and renewable energy, but it does not provide specific benchmarks. Comment Uganda: A target of the Poverty Eradication Action Plan (PEAP) 2000 is to achieve "12% rural electrification by 2010.

<sup>4</sup> Comment Tanzania: The MTEF is under development. Comment Uganda: A category exists in the MTEF for 'Energy and Minerals [Natural Resources]' but there is no standalone category for energy identified.

<sup>5</sup> Comment Kenya: The budget allocations for energy are thoroughly disaggregated. Specific amounts of money are linked to projects for "reliable energy services available at lower costs," "access to electricity by rural communities," "increased usage of alternative energy resources," "the increase of LPG consumption," "lowering costs and improving competition as well as creating safety standards," and for "discovering petroleum and coal deposits."

|                      | Kenya   | Tanzania  | Uganda   |
|----------------------|---|---|--|
| Targets              | <p>40% electrification of rural population by 2020</p> <p>Increase rural access by 1% per annum from 3.8% to 8% by 2006</p> <p>10% increase in KCJ adoption, 5% increase in maendeleo stove adoption by 2006</p> <p>Installed capacity of solar energy increased by 10% per year</p> <p>Increase LPG consumption from 32 000 m/tons to 50 000 m/tons by 2006</p>  | <p>Reduce the proportion of the population depending on biomass energy for cooking from 90% in 2003 to 80% in 2010</p> <p>Increase contribution of solar, wind and biomass and coal for electricity generation from 0.5% in 2003 to 3% by June 2010</p> <p>Liberalise the power sub-sector by 2010</p> <p>Negotiate, conclude and sign at least three Production Sharing Agreements by June 2010</p>  | <p>10% coverage of households the rural electrification fund by 2012 through grid extension, independent power producers, and solar or renewable energy</p> <p>Participation of 40% of the biggest 50 electricity consumers in energy audits to reduce load shedding</p>   |
| Operating Principles | <p>Increase availability, reliability and affordability of electricity</p> <p>Expand private sector participation in generation and distribution of electricity</p> <p>Harness traditionally underutilised solar energy in various applications including alternative grid</p> <p>Extension for electricity provision, telecommuncations repeater facilities, water heating, crops drying, refrigeration and water pumping</p> <p>Support the popularisation of wind power</p> <p>Favour a policy promoting sustainable wood resource management and efficient harvesting and end-use technologies</p>                              | <p>Ensure the provision of reliable and affordable energy to consumers</p> <p>Promote rational and efficient use of power</p> <p>Promote indigenous energy sources and diversify energy sources</p> <p>Ensure regular and reliable supply of essential utilities including energy, water and sanitation in urban areas</p> <p>Ensure sustainable natural resource use to ensure energy supplies are maintained (forests, water catchments, and charcoal industry)</p>   | <p>Establish commercially viable tariffs, with subsidies to domestic consumers being unjustifiably inequitable</p> <p>Enable private sector participation in the sector including rural electrification and foster private sector led investments</p> <p>Subsidise investments in infrastructure for rural electrification rather than financing outright connections</p> <p>Base subsidies on financial and economic soundness of a project, sound environmental impact statements, positive social returns, and equitable electricity distribution</p> |
| Initiatives          | <p>Strengthen regulatory capacity of existing agencies</p> <p>Reduce government's direct equity in Kenya Power and Lighting Company from 51% to 39%</p> <p>Restructure Kenya Electricity Generating Company to enable private public partnership to mobilise investment for enhancing generation capacity</p> <p>In partnership with the private sector and NGOs, develop a framework to provide incentives for solar energy users</p> <p>Streamline rural electrification by creating the Rural Electrification Agency (REA)</p> <p>Upgrade slums and loc cost housing to include provision of electricity distribution points</p> | <p>Update the power systems master plan, expedite implementation of the power projects, and finalise restructuring of the power sub-sector</p> <p>Issue guidelines and regulations to enforce a reduction of energy losses in transportation, transmission and distribution</p> <p>Privatise generation and distribution</p> <p>Promote on-shore and offshore petroleum exploration</p> <p>Promote coal electricity for generation and thermal applications</p> <p>Implement rural energy master plan with focus on extension of rural electrification schemes, development of renewable and alternative sources of energy, and grid connections to unconnected areas</p> | <p>Increase generating capacity through private investors</p> <p>Implement the rural electrification strategy</p> <p>Monitor by the government of unit costs and socio-economic returns to rural electrification</p> <p>Promote improved stoves and energy efficiency</p> <p>Improve managerial efficiency and negotiate favourable terms for export of electricity</p> <p>Implement an energy awareness campaign</p>  |

**Table 3 Summary of energy references in the PRSPs of Kenya, Tanzania and Uganda**

## 5. CONCLUSIONS

The constraints that energy poverty- imposes on a development strategy are still invisible in the mainstream development debate in East Africa. The ways in which energy needs are met has important implications for rural people, but people themselves, unlike policy-makers; do not separate the need for water, energy services, education, health, transport and employment in a sectoral way.

We have seen that energy services not only contribute directly to improving the quality and quantity of services delivered within the health, education and water sectors, energy services also play important roles in improving efficiencies of other sectors. There are strong linkages not only between improved energy services and better health, education and water services but also between the social sectors themselves. There is a need of improving the sectoral planning to incorporate energy into the planning, design, operations and development activities.

The policies, strategies and plans reviewed under Work Packages 1 and 2<sup>7</sup> have indicated there are some gaps and areas of improvements required in the institutional framework to include energy as an important requirement for provision of health, education and water services.

Some of the actions that are needed to improve the inclusion of energy in the sector strategies and the PRSP are identified as follows:

- Explicitly elaborate on energy measures required for developing and improving provision of health, education and water services in existing sector policies, strategies and programmes.
- Conduct feasibility studies to assess and set standards for affordable energy technologies and delivery models in the health, education and water sectors;
- Allocate funds for improving delivery of energy services during sector budget preparation;
- Diversify energy technologies, services, and delivery models; and
- Strengthen capacity for information management and decision making with regard to energy technologies and services at the local level.

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<sup>7</sup> Policy review: Health, Water, Education and Energy Sectors, Tanzania, Kenya, Uganda, ENABLE (WP1), 2006; Establishing the role of energy in the National Poverty Reduction Strategies: a review paper, Tanzania, Kenya, Uganda, ENABLE (WP2), 2006; available from [www.enable.nu](http://www.enable.nu) .