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DEA

Development and Energy in Africa

Intelligent Energy – Europe (IEE)

Type of action: COOPENER

Key action: VKA11.1

Second National Workshop Report Ghana

Date of workshop: 2 November 2006

Start date of the project: 1 May 2005

Duration: 30 months

End date of the project: 31 October 2007

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...innovating clean energy solutions...



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1.0 Introduction

The Development and Energy in Africa (DEA) is a 30-month long project funded by the European Commission under its Intelligent Energy - Europe (IEE) COOPENER Programme and co-financed by the Danish Government. The project is being implemented by Risoe National Laboratory of Denmark, the project coordinator, and in collaboration with Energy Center of Netherlands (ECN) in partnership with six African centres. The Kumasi Institute of Technology and Environment is the project partner in Ghana.

The principal aims of the DEA project are:

1. To identify and examine the developmental impacts of energy interventions linked to improving energy access and poverty alleviation.
2. To use the information and insights gained to improve on-going and future energy interventions by energy policymakers and institutions in six Sub-Saharan African countries: Botswana, Ghana, Mali, Senegal, Tanzania and Zambia.

The project is being implemented in three stages. In the first stage, information was obtained through three parallel Work Packages that facilitated and formed the basis for the development of an Assessment Framework, specifically for evaluating the impacts of energy innovations on sustainable development. The three parallel activities are:

- (i) A literature survey
- (ii) A cataloguing of experience with relevant energy projects and innovations in the target countries
- (iii) A process of consultation with stakeholders in the respective countries.

In the second stage, the Assessment Framework itself was developed, then tested through national Case Studies and refined. Finally, in the third phase, the Assessment Framework will be presented to policy makers and stakeholders in the six countries and eventually introduced further in the region and other developing countries.

The key output of the DEA project is an Assessment Framework which will be an operational tool for policy makers and other stakeholders to integrate the complex linkages between energy interventions and socio-economic development into poverty reduction programs. The tool will allow energy interventions to be better designed to contribute to real development needs, especially poverty

alleviation and income generation, and to achieving the millennium development goals.

1.1 Objectives of Workshop

The purpose of the second national workshop in Ghana was to present the Assessment Framework and the results of the National Case Study (impact of grid electrification on selected rural communities) to a broader stakeholder's forum from all the relevant sectors identified in the Growth and Poverty Reduction Strategy (GPRS) II. The case study was used to test the Assessment Framework. The workshop was also used to receive feedback from the stakeholders and to explore ways of soliciting stakeholder buy-ins to the use and acceptance of the Assessment Framework.

1.2 Participants

Participants at the workshop were mainly from the Ministries, Departments and Agencies (MDAs) as well as the private sector and non-governmental organization (NGO). There was a total of 13 participants. See *Appendix 1* for list of all participants.

2.0 Plenary Session

The workshop started around 10:00am with an introduction of participants and a welcome address by Mrs. Theodora Oduro, a Projects Manager, on behalf of Mrs. Harriette Amissah-Arthur, Director of KITE. In her address, Mrs. Theodora Oduro gave a brief background to the DEA project and the purpose of the workshop and indicated that the workshop will afford participants the opportunity to share ideas and lessons while receiving feedback to help refine the Assessment Framework." She concluded by thanking all participants for making time to attend the workshop .After the address, Mr. Solomon Quansah introduced the resource person for the workshop, Mr. Emiel Sambeek from ECN.

2.1 First and Second Presentations¹

In all, 4 presentations were made at the workshop. Mr. Emiel Sambeek from the ECN introduced the participants to the DEA project, stating that it was a project that was meant to find a link between energy interventions and development. He

¹ All presentations are presented separately in PowerPoint formats.

further stated that the project had developed a methodology (the Assessment Framework (AF)) in collaboration with six African countries to find a tool that creates knowledge on the linkages between energy and development. He indicated that the AF was very useful for assessing impact of energy interventions, be it a project, program, or a policy intervention on the various sectors of the economy. Case studies were used to test the AF on different technologies in all the six countries.

2.2 Third Presentation

The second presentation was made by Mr. Solomon Quansah on the Assessment Framework and he explained the various tools in the Assessment Framework while laying emphasis on its usefulness. He said the AF is a step-by-step approach to carrying out an impact assessment of energy interventions and that it encompasses the choice of indicators, the causal chain, data collection methods, data analysis techniques, and the optimal presentation of information among stakeholders.

2.3 Fourth Presentation

In the third presentation on the national case study, Mr. Solomon Quansah indicated that the case study was carried out on three communities in the Central Region by the application of the Assessment Framework and that emphasis was laid on the variables that made up the Assessment Framework, including choice of indicators for the four-level model (input, output, outcome and impacts). In conclusions, some analysis of the objectives of the rural electrification program was done vis-à-vis the results obtained from the case study. The results of the case study established the adequacy of the AF and further emphasised the importance of researchers' having local knowledge on the approach to research methodologies in the target communities as well as other issues such as the traditional governance structure, gender relations etc in order to carry out successful researches.

3.0 Discussions

The key focus of the discussion segment was to solicit stakeholder views on how information gathered could be used to improve the assessment framework to

influence policy formulation and program design. Highlights of discussions are as follows:

- It was observed that all the communities involved in the surveys were localized – all in the central region and did not serve as a fair representation of the situation in the nation but a representative of the Electricity Company of Ghana (ECG) indicated that the results were similar to other case studies that had been carried out in other parts of the country.
- Attention of participants was drawn to the importance of taking the cultural difference and practices into considerations when interpreting results of such case studies because differences in culture influence the behavioural patterns of societies and hence the impact of interventions.
- The case study was used to test the adequacy of the Assessment Framework and as such could be adopted for wider scale studies. More finances could be sought from interested parties and organisations like ECG, Volta River Authority (VRA) etc to carry out such researches.
- Participants unanimously commented that the Assessment Framework was a very good and useful tool and the next step was to explore ways of integrating it in all the sectors for proper planning and evaluation of interventions.
- Participants consented to the fact that the policy needed to complement such energy interventions to ensure success was missing and that other sectors concerned needed to get on board in order to have the synergy to realise increased and useful outputs. They further continued that a platform was needed to place energy in its right place of developmental issues.

4.0 Closing and Way Forward

In their final remarks participants were of the view that the Assessment Framework will be very useful not just in assessing energy interventions but it could be used in other sectors as well. Participants from the Energy Commission indicated their willingness to meet with the DEA team for further deliberations on how to integrate the AF in their activities. A meeting was therefore arranged for

follow-up. The team (Emiel Sambeek and Solomon Quansah) met with the Executive Director of the Energy Commission (EC) of Ghana and two of his technical staff to firstly present the AF to the Energy Commission and secondly to assess how the EC will integrate the AF in its activities. The outcome of the meeting is as follows:

1. The EC finds the AF as a very useful tool and would want to use it in its activities
2. The next national workshop should be used as a 'TRAINING WORKSHOP' to offer training to the EC and any other institutions that would find the AF useful. This will serve to help integrate the AF in the institutions' activities.

Appendix 1 – List of Participants

Name	Organisation	Position/Department	Telephone(s)	Email
Joseph Essandoh-Yeddu	Energy Commission	Policy and Planning Division	020 -8187199	jeyeddu@yahoo.co.uk
Sylvester Owusu	Agric. Eng. Services Directorate/MOFA	Deputy Unit Head	021-777789, 024-4628305, 028-5061111	Vesterowusu@yahoo.com
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Albert Berkoh	KITE		021- 256800	aberkoh@kiteonline.net
Ms. Isabella Asimadi	KITE		021- 256800	iasimadi@kiteonline.net
Bernard Oduro	KITE		021- 256800	boduro@kiteonline.net
Ben Kwame	KITE		021- 256800	

Appendix 2 – Welcome Address by Mrs Theodora Oduro-Projects Manager, KITE

Representatives of development institutions, representatives from ministries, government agencies, NGOs, invited Guests, Distinguished Ladies and Gentlemen, It is a great honour for me to welcome you all this morning to the second National Stakeholders' Workshop on the 'DEVELOPMENT AND ENERGY IN AFRICA (DEA)' project. The DEA project was launched in May 2005 and is to run for three years with sponsorship from the European Commission (EC) COOPENER Programme and the Danish International Development Assistance (DANIDA).

DEA aims at supporting decision makers with the implementation of more sustainable energy policy by identifying and quantifying, where possible, the elements of concrete energy interventions that contribute to sustainable development and systemizing this in an assessment framework which can enhance policy to promote energy for sustainable development.

DEA is being implemented by Risoe National Laboratory of Denmark as the project coordinator in collaboration with the energy center of Netherlands and in partnership with six African centers. KITE is the project partner in Ghana.

Distinguished ladies and gentlemen, we are here today to talk about how we can effectively assess the various developmental impacts of energy interventions, their contribution towards poverty reduction and how information obtained can be used to improve the policy management machinery and project development. The multi-sectoral representation at this workshop is no accident; it is infact the reflection of the multi-sectoral nature of development itself.

The DEA project is being implemented in three stages. In the first stage, information was obtained through three parallel Work Packages that facilitated and formed the basis for the development of an Assessment Framework, specifically for evaluating the impacts of energy innovations on sustainable development. The three parallel activities are:

1. A literature survey

2. A cataloguing of experience with relevant energy projects and innovations in the target countries
3. A process of consultation with stakeholders in the respective countries.

In the second stage, the Assessment Framework itself will be developed, then tested through national Case Studies and refined. Finally, in the third phase, the Assessment Framework will be presented to policy makers and stakeholders in the six countries and eventually introduced further in the region and other developing countries.

Distinguished ladies and gentlemen, our mission today is to present the Assessment Framework and the national Case Studies that were used to test the Framework to a broader stakeholder's forum from all the relevant sectors identified in the GPRS II. This we believe will afford us the opportunity to share ideas and lessons with you while receiving feedback to help refine the Assessment Framework.

I wish to take this opportunity to express our gratitude to EC Coopener and DANIDA for sponsoring the DEA Project. And to you distinguished ladies and gentlemen, thanks for making time to be with us and I wish you fruitful deliberations and a successful workshop.

Thank you.

Appendix 3 – Workshop Program

DEA SECOND NATIONAL WORKSHOP

NOGAHIL HOTEL

AGENDA

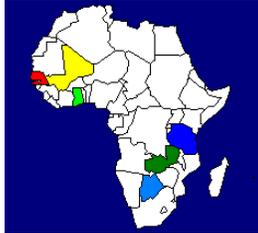
- | | |
|---------------|------------------------------------------------------------------------------------------------|
| 08 30 – 09 00 | Registration |
| 09 00 – 10 00 | Introduction – status of DEA project
<i>(Risø/ECN representative)</i> |
| 10 30 – 11 00 | Tea/coffee break |
| 11 00 – 11 30 | The Assessment Framework (AF) – the Fringilla
Process
<i>(Ghana project coordinator)</i> |
| 11 30 – 12 30 | National Case Study
<i>(Ghana project coordinator)</i> |
| 12 30 – 13 00 | Discussion of National Case Study |
| 12 30 - 14 00 | Lunch Break |
| 14 00 – 15 00 | Case studies in other 5 DEA countries
<i>(Risø/ECN representative)</i> |
| 15 00 – 15 30 | Coffee Break |
| 15 30 – 16 00 | Other cases studies continued and discussion of the
usefulness of the AF |
| 16 00 – 17 00 | Conclusions, stakeholder views, improvement of the
AF |

Appendix 4 – Presentations

Presentation 1: DEA project overview by Emeil Sambeek

Development and Energy in Africa (DEA)

Emeil van Sambeek
Energy research Centre of the Netherlands (ECN)

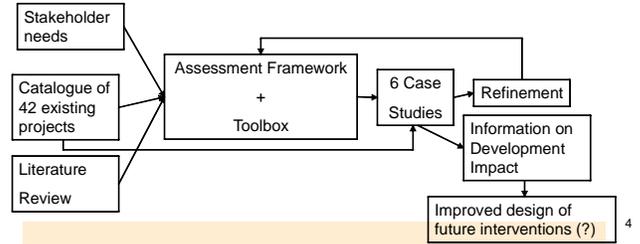


Development and Energy in Africa (DEA)

start 1 May 2005, duration 30 months

Objectives:

- to establish and apply an Assessment Framework for evaluating development and poverty alleviation impacts of energy interventions
- to engage in a dialogue with energy policy makers and other stakeholders on the basis of the framework, with a view to incorporating these issues in energy policy.



DEA – overview

- develop and use a methodology for impact analysis in 6 African countries
- focus on small/medium energy projects
- 6 African Centres as partners
- involve multi-sector stakeholders
- explore how information on impacts can influence policy and project formulation
- capacity building and awareness raising
- Overall objective of 2nd National Workshops:

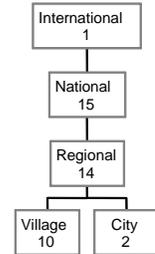
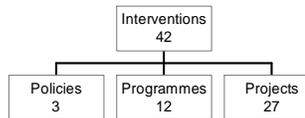
“...to report to you our findings of the Case Study and agree on how the Assessment Framework we are developing as part of DEA can be developed so that it will help the country in future Energy Planning and Policy Development.”



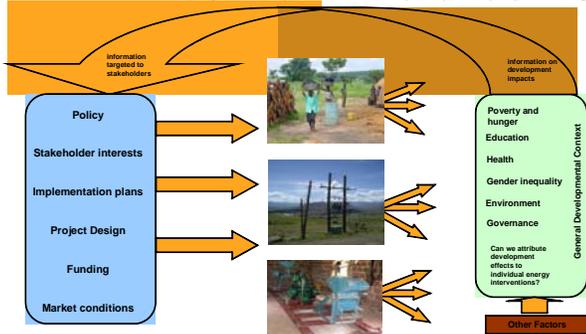
Catalogue of Energy Interventions: geographical distribution and scope of interventions

Botswana	9
Ghana	9
Mali	10
Senegal	5
Tanzania	5
Zambia	4
Total	42

Information on existing energy interventions in 6 countries compiled by partner centres in national catalogues, providing candidates for Case Studies.



Can information on development impacts influence policy and project design?

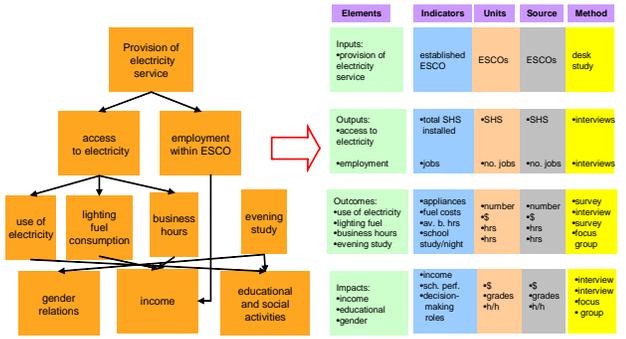


Types of interventions in the catalogues

- Fuel improvement and efficient use
 - Sustainable fuel wood forest management and forestation
 - Improved stoves
- Fuel substitution
 - LPG marketing Briquette production and distribution
 - Charcoal production and distribution
 - Kerosene promotion
 - Jatropha seed oil production and marketing
 - Biogas
- Mechanical power
 - Multifunctional platforms
 - Solar and wind water pumping
- Electrification
 - Grid electrification
 - Solar home systems
 - Solar PV for schools, hospitals and public lighting
 - Hybrid mini-grids

From 4-level diagram to tables

- 4- level causal link diagram – similar to Logframe



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Additional case study: Evaluating the impact of an improved cookstove project in Tanzania



Mairi Dordard

MSc dissertation for MSc Environmental Change & Management, University of Oxford

Supervisors: Phil Mann, Environmental Change Institute, University of Oxford
Dr Gordon Mackenzie, UNEP Riso Centre, Denmark

In co-operation with Tanzania Traditional Energy Development & Environment Organisation (TaTEDO)

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Case Studies

- Case Studies linked by a common purpose: to identify, quantify and document development impacts
- Case Studies linked by a common approach
- Criteria
 - representative: the CS should span a number of different types of interventions in order to "test" or develop the AF
 - coverage of key sectors and energy project types
 - national relevance
 - should be achievable, data available for both the energy intervention and potential impacts
 - baseline available
- Common approach refined, made operational, presented as a method for integrating development impact information into policy and project design

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After the Case Studies?

- 2nd National Workshops October-November 2006
- Present Case Studies to multi-sector stakeholders
 - focus on national case
 - discuss all 6 case studies in each country

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Case Studies

Country	Selected case Study
Botswana	Grid Rural electrification through the Rural Electrification collective scheme
Ghana	Grid-based rural electrification
Mali	Women Renewable Energies Project (focus on one area)
Senegal	PROGEDE (focus on improved stoves)
Tanzania	Small-scale irrigation using solar and wind energy
Zambia	Solar Energy Supply Companies (ESCOs)

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Outcome of the 2nd National Workshops

- Response of the stakeholders
- Is the DEA methodology useful?
- Can it be improved?
- Refinement and enhancement of the AF
- Presentation in the broader African context – Arusha 2007?

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Presentation 2: The Assessment Framework –Mr.Solomon Quansah,KITE



THE ASSESSMENT FRAMEWORK

Solomon Kodjo Quansah
KITE



The Assessment Framework

The Assessment Framework (AF) is a step-by-step approach to carrying out an impact assessment of a given energy intervention.

It is an operational **tool** for policy makers and other stakeholders to integrate the complex linkages between energy interventions and socio-economic development into poverty reduction programs.

The AF encompasses the **choice of indicators**, the **causal chain**, **data collection methods**, **data analysis techniques**, and the **optimal presentation of information** among stakeholders.



Why an Assessment Framework

- The need to identify, quantify and document development impacts of energy projects
- The need to have a systemic approach to assessing these impacts
- Identify and build on a common approach
- Common approach refined, made operational, presented as a method for integrating development impact information into policy and project design

From energy intervention to development impact

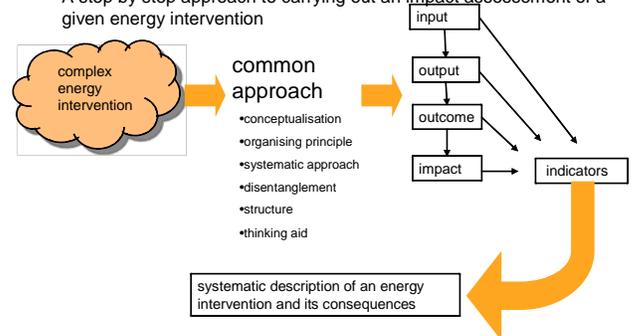
- The attribution gap -The basic problem is to trace a causal chain, from the inputs brought to a project or programme, downstream, all the way or part way to macro impacts related to government development goals, or the MDGs.
- Why is causality more complex in energy projects than in other projects:
 - energy as a technical factor of production, goes into everything, but is not directly consumed
 - multiplicity of impacts
 - complex inter-relation with other activities, ie. little impact from energy alone
 - difficulty of establishing linear causal relations.

(source: M&EED Guidelines v. 3 2005)



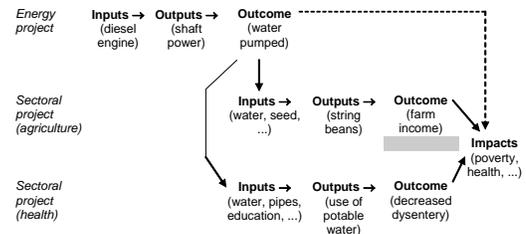
The common approach – The ASSESSMENT FRAMEWORK

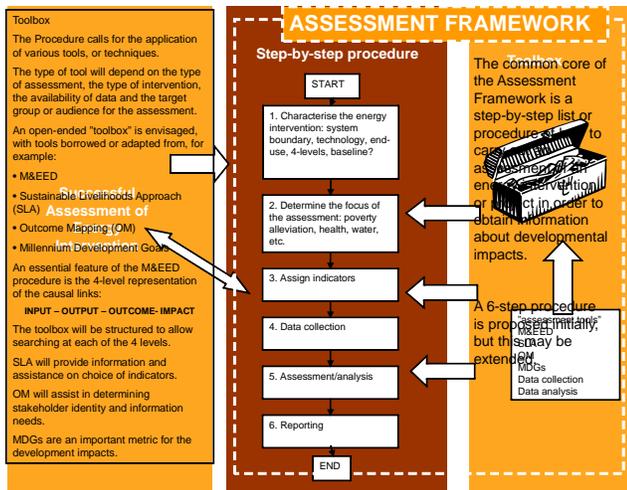
- A step by step approach to carrying out an **impact** assessment of a given energy intervention



Four-level model or representation

- similar to Logical Framework used in planning of most projects
- adopt terminology used by EC and M&EED





Presentation 3: The National Case study – Mr. Solomon Quansah, KITE



IMPACT OF ELECTRIFICATION (BY GRID EXTENSION) ON RURAL COMMUNITIES

Solomon Kojo Quansah
KITE

Aim

1. The aim of the study was to investigate the impacts of rural electrification by grid extension on the social, economic and other aspects of the lives of the people.
2. To assess the adequacy of the Assessment Framework.

3



Outline

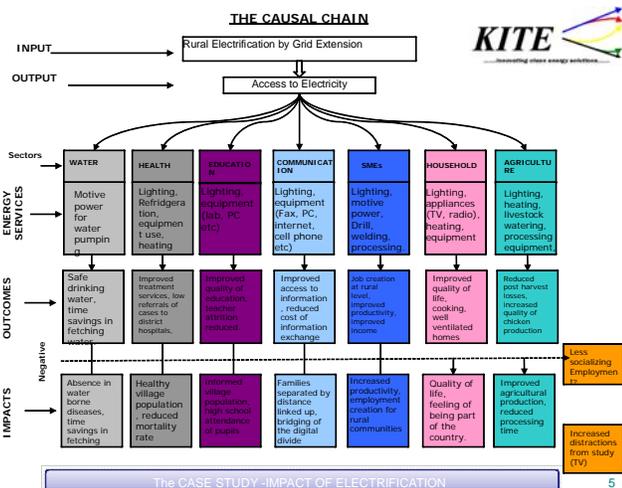
- Aim
- Location
- The Causal chain and Tools
- Research methodologies
- Results
- Relevant Findings
- Final Thoughts

Location: 3 Comm. in C. Region

1. EKUMFI-OTABANADZE,
 - Pop. is abt 1000, 1 Kdg, 1 Primary, 1 JSS
 - drinks borehole water, no bank, no post office.
 - *Real access in the community is about 75%.*
- EKUMFI-EKRAWFO
 - Pop.-1000, 1 Kdg, 1 Primary, 1 JSS
 - drinks borehole water, no bank, no post office.
 - *Real access in this community is about 40%.*
- EKUMFI-ATAKWA
 - Pop.-1700, 1 Kdg, 1 Primary, 1 JSS
 - borehole water, no bank, has a post office, private clinic which is about 100 meters away from the community.
 - *Real access in this community is about 75%.*

4

2



The Tools 3:

The Research Plan (what-when-who):

	WHAT	WHEN	WHO	REMARKS
PREPARATION	Finish draft questionnaires	July, 11th	SQ	share questionnaires with EECG
	Receive comments and finalise questionnaires	July, 13th	SQ	
DATA COLLECTION	Desk study	late July/Aug-ongoing	SQ	continued exercise
	Interviews	late Jul-Aug	RA	
	FG	Aug	AB	
	HH surveys	Aug	RA	
	observation	Aug	RA/AB/SQ	done same time as interviews
ANALYSIS AND REPORTING	Data analysis	Sept	AB/SQ	
	Report writing	Sept	SQ	waiting for format
	Discussing draft report	Sept	SQ/stakeholders/GM etc	
	Finalising report	Sept/oct	SQ	
	communicating results	Oct	SQ/stakeholders/GM etc	national workshop to be coordinated

The Tools 1:

The Indicator Table:

ELEMENTS	WHAT TO MEASURE	INDICATORS	UNIT	SOURCE	DATA COLLECTION METHODS
Output	Increased access to electricity	Total no rural households connected	Connections & %	Utility records	Interview/desk study
Output	Increased access to electricity	No of rural households using electricity in 2006	Rural households	Utility bills	Survey
Outcome	Increased use of modern electricity appliances	Types of appliances per end use	N/A	Households	Survey
Outcome	Direct Job Creation on electrification	No of locally recruited employees during electrification	Employees	Rural electrification contractors/households	Interview/survey/desk study
Impact	Reduced Air Pollution	Reduced respiratory/eye illnesses in villagelectrified vs nonelectrified households	Numbers	Clinic records	Observation
Impact	Awareness on health issues	Community ICT equipment	Village programmes	Schools/households	Interviews, survey, desk study.
Impact	Gender Needs met	Boys/girls fetching fuel	Numbers	Households	Survey/desk study

Research Methodologies

1. Questionnaires

– questionnaires were developed guided by the indicators and what to measure etc. Data from the field study was collated and analysed for direct and derived conclusions.

2. Close and personal observations

– of respondents and facilities within the communities, and

3. Desk study

– from different reports such as the Achievements of the National Electrification Scheme (NES), and Internet.

The Tools 2:

The Research Plan Guide:

SOURCE	METHOD	SAMPLE SIZE	RESPONDENT	RESOURCES	DURATION-DAYS
Clinic Villagers	interviews	40-50	affluent	1P+ 3 RA	10
	focus groups	10	female	1P +AP+ 3RA	1
		10	males	1P +AP+ 3RA	1
		20	combined	1P +AP+ 3RA	1
	interviews	1	Matron/head	1P+AP	0.5
		2	nurses	1P+AP	0.5
		10	patients	AP+RA	1
	records		patient records/volumes	1P+RA	
	observation		equipment	P+AP+RA	same time as interviews
farmers	interviews	1	owner	P+RA	1
		2 to 5	workers	RA	
	data processing			AP	5
	analysis			AP	12
	Report writing			P+AP	5
total					44

Results 1

• Household Sector

- Use of Modern Electrical Appliances –Has increased considerably with almost every household owning an appliance.
- Employment Creation: marginal impact
- Household Income: Has increased thru. sale of iced water etc.
- Energy Types and Use: electricity, kerosene, candles, firewood, charcoal, batteries (dry-cell) generally on the ascendancy.
- Assets ownership (electrical appliances): Increased from virtually 0 to about 40% ownership of household assets.

• Education Sector

- Reduced staff attrition
- Improved performance of pupils as a result of evening studies

Results 2

- Health Sector
 - No direct significant improvement (lack of health facilities)
 - Reduced eye/respiratory diseases
 - Reduced snake bites
- SME Sector
 - Marginal impact experienced
 - Perception on electrical phase capability
 - Lack of capital, loan for startup.

The CASE STUDY - IMPACT OF ELECTRIFICATION

11

Relevant findings

- Transport cost – ECG should collect the bill
- Unfair disconnection methods
- Unfair cost of extending electricity to houses (same as in the cities)
- Plantations of electric poles - no one to buy poles
- Worrying Perceptions
 - *Wrong meter reading by meter readers*
 - *Single vs Three Phase wiring capabilities*
- Exploitations – tricksters playing on rural folks
- Innovating bill collection methods

The CASE STUDY - IMPACT OF ELECTRIFICATION

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Results 3

- Agriculture Sector
 - No direct impact recorded. All farming activities here are subsistent.
- Communication Sector
 - Significant impact; ownership of mobiles phones or access to mobiles phones; fax machines
- Water Sector
 - No direct impact – borehole use (non motorised)

The CASE STUDY - IMPACT OF ELECTRIFICATION

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Results vis-à-vis the NES 1

A reminder - the National Electrification Scheme goals;

1. Poverty reduction, especially in the rural areas;
2. Increasing the overall socio-economic development of the nation;
3. Increasing people's standard of living, especially those in the rural areas;
4. Creating small-to-medium-scale industries in rural areas;
5. Enhancing activities in other sectors of the economy, such as agriculture, health, education, tourism, etc;
6. Creating jobs in the rural areas and thus reducing the rate of rural to urban migration.

The CASE STUDY - IMPACT OF ELECTRIFICATION

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Results 4

Other Social Impacts

- *Social knowledge equity*: increased knowledge in communities – radio, television
- *Increased collective socializing* – extended social programmes - funerals, video shows etc
- *Alternatives to bedtime entertainment* : Bed-time has been shifted to later hours
- *Expansion of communities* : other people coming in to settle
- *Increased gender sensitivity* : discussions on media have engendered this sensitivity.

The CASE STUDY - IMPACT OF ELECTRIFICATION

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Results vis-à-vis the NES 2

- *Goal 1 -- Poverty reduction, especially in the rural areas*
 - Direct/significant poverty reduction could not firmly be established.
 - The increasing costs of living (fuel prices, goods, transport, low employment).
 - To curb this trend, more needs to be done in the areas of employment creation in the rural areas and providing subsidized/special services such as special transport fares etc.
- *Goal 2 -- Increasing the overall socio-economic development of the nation*
 - increase in knowledge, in touch with the outside world.
 - increased gender-sensitivity through education on the radios and television.
 - awareness of rights and responsibilities.
 - increase in assets ownership such as Television sets, refrigerators etc.
- *Goal 3 -- Increasing people's standard of living, especially those in the rural areas*
 - impacted positively on the living standards in some respect.
 - increased sense of security and safety in the communities. Respondents said that snake bites for instance had dropped drastically.
 - There are increased social activities at night due to lighting.

The CASE STUDY - IMPACT OF ELECTRIFICATION

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Results vis-à-vis the NES 3

- *Goal 4 -- Creating small-to-medium-scale industries (SMEs) in rural areas*
 - Creation of small-to-medium-scale industries has not occurred (or marginal).
 - due to the inadequacy of the electric energy provided
 - Lack of capital, well developed marketing systems.
 - innovative financing schemes and loans, education on single vrs 3 phase capabilities
- *Goal 5 -- Enhancing activities in other sectors of the economy, such as agriculture, health, education, tourism, etc;*
 - Some of the sectors had experienced positive impacts as a result of electrification however others had had no direct positive impacts
- *Goal 6 -- Creating jobs in the rural areas and thus reducing the rate of rural to urban migration have been partly achieved*
 - Job creation is minimal. The general lack of SMEs had led to the lack of jobs and the inherent migration of the youth from these communities.

THANK YOU

ANY THOUGHTS?

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Final Thoughts

Adequacy of Assessment Framework

- The AF is adequate for pre-research planning, however researchers would have to know the ff:
 - the peculiar needs of the research that is to be carried out and adapt the framework to suit their purposes.
 - local knowledge on the approach to research methodologies in the targets communities.
 - traditional governance structure,
 - gender relations etc in the communities

Presentation 4: Adequacy of the Assessment Framework on other projects

– Mr. Emeil Sambeek, ECN



Development and Energy in Africa

Case studies on the linkages between energy interventions and development impacts




Case Studies

- Botswana – rural electrification
- Ghana – rural electrification
- Mali – combined technologies in several villages
- Senegal – improved stoves
- Tanzania – solar and wind energy water pumping
- Tanzania – improved stoves
- Zambia – solar home systems

Objective of the case studies

- Demonstrate the impacts of energy interventions on development
- Testing of the DEA assessment framework

Methodologie

1. Defining inputs, outputs, outcomes and impacts for each intervention or project (causal tree)
2. Defining indicators for each input, output, outcome and impact
3. Identifying the sources of information for each indicator
4. Defining methodologies for obtaining the data and to measure each indicator
5. Elaborating a research plan
6. Implementing the research plan
7. Reporting about the results

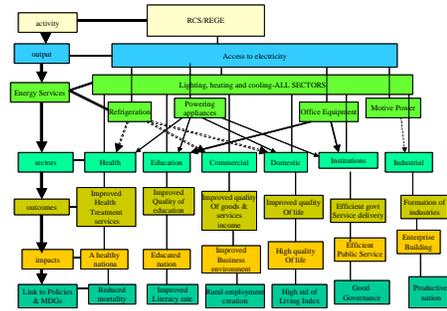
Methodology

Elements	Indicators	Units	Source	Method
Inputs: *provision of electricity service	established ESCO	ESCOs	ESCOs	desk study
Outputs: *access to electricity	*total SHS installed	*SHS	*SHS	*interviews
*employment	*jobs	*no. jobs	*no. jobs	*interviews
Outcomes: *use of electricity	*appliances	*number	*number	*survey
*lighting fuel consumption	*fuel costs	*\$	*hrs	*interview
*business hours	*av. b. hrs	*hrs	*hrs	*survey
*evening study	*school study/night	*hrs	*hrs	*focus group
Impacts: *income	*income	*\$	*\$	*interview
*educational	*sch. perf.	*grades	*grades	*interview
*gender	*decision-making roles	*h/h	*h/h	*focus group

Botswana – rural electrification

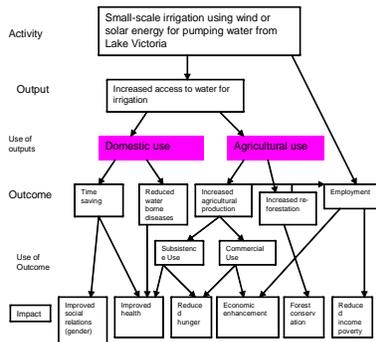
- Village of Manyana (population around 3000)
- 35% of households electrified, 50% of businesses, school and clinic
- Demonstrated outcomes:
 - Refrigeration
 - Communication and lighting
 - Increased business opportunities for entrepreneurs
 - Increase in sales from shops
 - Improvement of living conditions and conditions for education and health service
- More difficult to demonstrate impacts in relation to the MDGs or national development plans

Botswana – rural electrification



Tanzania – solar and wind water pumping

- Village of Nakatunguru – wind energy
- Village of Namagubo – solar
- Management by farmer groups
- Methodologies for collection of information: questionnaires, interviews, literature, focus groups
- Results:
 - Increased sensitisation among farmers on the possibilities of modern and renewable energy technologies
 - Access to water for irrigation
 - Increased agricultural productivity
 - Reduction of poverty
 - Time saving – particularly women
- Problems: lowering water table of Lake Victoria



Senegal – improved stoves

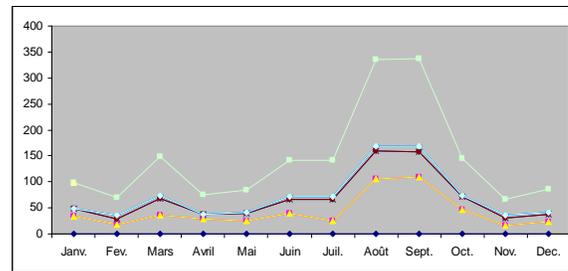
- rural, peri-urban and urban environment
- Methodology: interviews, focus groups and questionnaires
- Economic impacts:
 - Savings in fuel expenditure and replacement of stoves
 - Direct and indirect employment
- Social and health impacts:
 - Reduction of injuries from burns
 - Reduction of respiratory infections
 - Time savings, especially for women
- Environmental impact: fuel wood savings and reduction of CO2 emissions
- Indicators related to education were hard to measure

Tanzania – improved stoves

- Two villages: Sinon Ngarash and Mhero
- Methodology: questionnaires, interviews and focus groups
- Difficult to demonstrate very concrete links with development impacts: health impact was surprisingly little affected according to the respondents



Senegal – improved stoves



Zambia – solar home systems

- Two areas: Nyimba et Chipata
- Chipata: 150 systems installed, 138 functioning
- Nyimba: 96 systems installed and functioning
- Methodologies: questionnaires and literature
- Entrepreneurs, farmers, households
- Outcomes:
 - Extension of business hours for shops, hair dressers.
 - Charging of mobile phones
 - Lighting
 - Communication (Television, radios, etc)
 - Security at night
 - More time for study for children

Mali – Women renewable energy project

Région	Nombre de village	Nombre d'Éclairage	Nombre de chauffe eau	Nombre de Séchoir	Nombre d'Éolienne	Nombre de Plate-Forme	Total
Koulikoro	40	33	19	09	-	-	63
Ségou	44	40	27	12 dont 02 semi-industriel	02	01	82
Sikasso	46	40	28	06	-	15	89
Total	130	113	74	27	02	16 dont 03 avec presse Mécanique	232

Mali – Women renewable energy project

- Solar water heaters:
 - Improved health conditions (clinics: 228 users/year)
 - Fuel wood consumption and expenditure reduction
 - Income from hot water sales
 - CO2 emission reduction: 3 tons of wood: 4.5 tCO2
- Solar PV – lighting
 - Literacy
 - Improved working conditions in health centres
 - Reduced fuel consumption and expenses

Conclusions

- The DEA methodology worked well
 - Flexibility in use
 - Rigorous
 - Facilitates communication
- Clear demonstration of linkages between project – outputs – outcomes
- Measurement and attribution of the link from outcomes to impacts difficult, due to
 - Developments in other sectors
 - Time and budget restrictions

Mali – Women renewable energy project

- Solar dryers
 - Improved nutritional value
 - Increased food security
 - Increased revenues from agricultural products (700 \$/year)
- Wind energy water pumping
 - Increased food security
 - Increased revenues from agricultural products
- Multifunctional Platform
 - Reduction of women workload (50 women)
 - Time saving (2h/day)
 - Incoming generating activities

Conclusions

- The process of conducting the case studies is as interesting as the results due to the exchange of ideas, experiences and perceptions.
- Multi-sector input necessary for good case study
- Need to continue multi-sector exchanges to improve the methodology so that it can fulfill a role in national energy planning for development