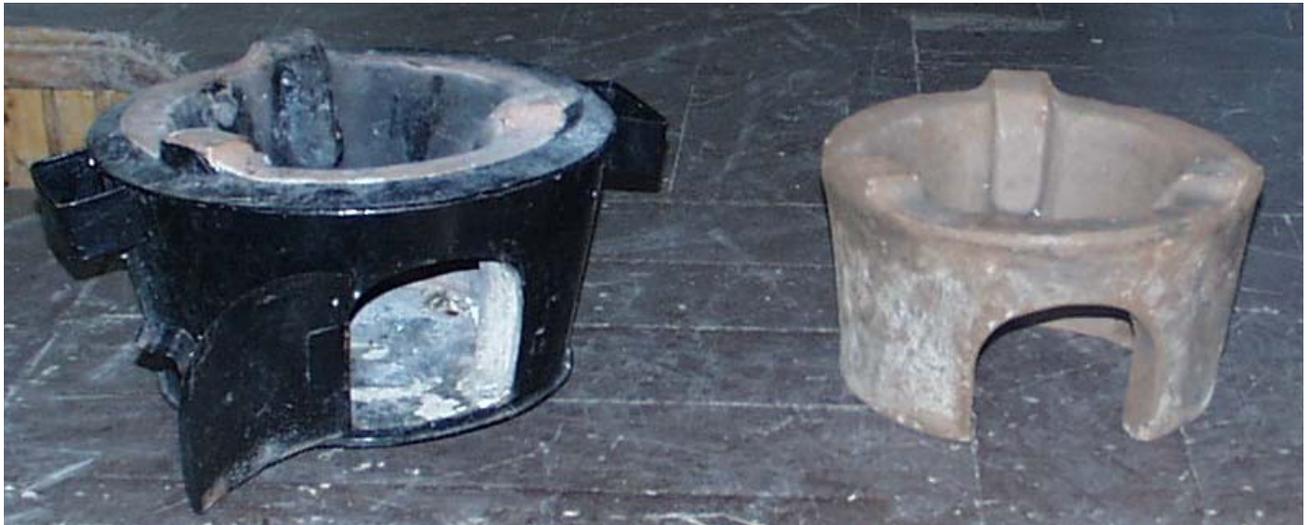


Data Analysis by Kinguru Wahome

Fieldwork by cluster managers, Home Economics officers and Enumerators

Improved Stoves Baseline Survey Study



By Pauline Wanjohi, Program officer PSDA

Data Analysis by Kinguru Wahome

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ACKNOWLEDGEMENT

I wish to thank the PSDA Programme Managers for the financial, moral and logistical support they gave the survey team that enabled the successful survey accomplishment. I also thank the DGIS for providing funds for the stove activities and particularly for this first activity of baseline survey.

I thank my colleague Anna Ingwe for her assistance in developing the questionnaires. I also thank all District Agricultural officers who gave permission and also supported the officers to participate in the survey. Thanks to you all other government administrators' especially chiefs of respective locations who supported the survey team a lot in community mobilization and actual ground work.

I also wish to thank the women who participated as respondents for good cooperation without which the survey could not have succeeded. Thanks to the whole survey team, Cluster managers and District Home Economics Officers for your commitment in supervision and ensuring that the survey protocol was adhered to. I also thank Division Home Economics Officers for supervising and supporting the enumerators and in some cases even conducting household interviews yourselves. I thank all Frontline Extension workers of the ministry of Agriculture and Enumerators for and conducting household interviews that contributed to the success of this work.

I also thank Mr. Kinguru Wahome for analysing the data to provide the results of the survey.

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LIST OF ABBREVIATIONS

AIDS	-Acquired immunodeficiency disease
GTZ	-German technical cooperation
HEB	-Home Economics Branch
HEEP	-Home Economics extension programme
HIV	-Human immunodeficiency Virus
ISP	-Improved stoves project
KCJ	-Kenya Ceramic jiko
KPT	-Kitchen performance test
Kg	-Kilograms
PSDA	-Promotion of private sector development in agriculture
PLWHA	-People living with HIV/AIDS
SEP	-Special Energy Project
SPSS	-Statistical package for social sciences
UN	-United Nations

1. INTRODUCTION

BACKGROUND INFORMATION stove activities in Kenya Stove activities started in 1981 following the UN Conference on New and Renewable Sources of Energy held in Nairobi In 1983 Women and Energy Project was initiated to support establishment of improved stove production centers (Ingwe, 2005)

Home Economics Branch (HEB) has been promoting household energy conservation since 1963. In the late 80's and early 90's HEB and GTZ Special Energy Programme (SEP) stepped up dissemination of household energy saving devices especially maendeleo liners.

The HEB disseminates energy efficient technologies is to reduce womens' workload so as to free them for more economically productive activities and child care that would translate into improved nutrition. Dissemination of energy efficient technologies became integrated into the Home Economics Programme as a core activity and is still going on to date Adoption of these technologies as measured by number of devices made/or installed has been steadily increasing over the years.

1.1 Survey objectives

1. To establish the number of household using improved stoves (maendeleo liners and Kenya ceramic Jiko (KCJ) in the study area.
2. To establish the number of people utilizing improved energy stoves
3. To determine the study population awareness of improved energy stoves
4. To determine the constraints that slow household utilization of improved stoves.
5. Identify intervention strategies in order to increase the number of household/people using improved energy stoves.

2.0 METHODOLOGY

The survey was a cross sectional survey carried in six districts in three clusters where PSDA was to implement stove activities. A total of 12 locations in divisions were covered. There was a household utilization survey that covered 432 households on assessing the utilization of the improved stoves and a detailed sub sample detailed kitchen performance test done in 90 household that was assessing household firewood utilization.

2.1 Training survey team

The survey team was thoroughly trained. This was done by use of lectures, role plays, group discussion and field practical during pre testing of questionnaires

The participants were then taken through the whole questionnaire on household stove use. Each questionnaire was discussed thoroughly and where necessary questions were rephrased for clarification. Training of participant covered sampling, interviewing procedures, Interviewing and Observation Techniques, Reviewing questionnaire. It also included coding responses and cross-checking questionnaires. Actual practicals included weighing, standardization and reading of scales. The actual field survey organization and operation was also discussed.



Figure1: PSDA Programme officer training on central team on survey protocol and procedures



Figure 2. Survey team members role play the interviewing session

The team went out for field pre-testing and later held discussions to review the pre-testing. Pre-testing was done in another division from the divisions where the actual survey data was collected.

Review of Most difficult issues experience/encountered while pre-testing questionnaires

Some respondents had difficulty in answering questions related to PLWHA. The questions were not well phrased. In some cases respondents feared or were not willing to discuss HIV/Aids issues. It was agreed that the questions should be left the way they are and one interviews to record all answers given by respondents even if they look

irrelevant. Some of the problems/mistakes and corrective measures that were undertaken at the field level.

Table 1. Field problems encountered and solutions

PROBLEM	ACTION
Household expenditure proportions were difficult for farmers to explain in 5 cases.	Enumerators to rephrase question in a language that respondents can understand.
Names, Age and occupation of family members	Respondents to do a good introduction and explain the purpose of the survey and the respondent to know they are a representative.
Time used looking for firewood.	It was agreed that question to be asked relating time of collection to time of the use of firewood e.g. Answers to show 7 hrs. for 3 – 5 months
Number of times of cooking and type of meals in Q No.2	Respondents to record actual times meals are cooked, the type of foods cooked and container used.
Fuel coping mechanisms	In Q No. one, a No 11 (a) was added to find out what foods were cooked the previous day. Ask if there are any foods in at are not cooked as required due to fuel wood shortage. Also find out if there are other fuelwood coping mechanisms e.g. soaking of grains.
Types of stoves	For many other stoves types not among the ones mentioned respondent should sketch and describe the Jiko and if possible organize a photograph.
Identification of Names of locations, divisions, village, respondent or enumerator	Respondent to revisit and information completed.
Coding and writing in full instead of using code.	Not a grave mistake if one has a problem of coding so long as the information is clearly written.
Skipping some questionnaire	Interviewer should be revisit respondent and if the interviewer is doing problem courteously the respondent should opt out of the survey.

Questionnaires serializing

All questionnaires were serialized to ensure adherence to the survey protocols.

Material requirements for the survey

- ❖ Spring balance
- ❖ Rope
- ❖ 2 kg rice
- ❖ Polybags (5/=)
- ❖ Folders
- ❖ Bags
- ❖ Pencils/rubber/sharpener
- ❖ Questionnaires

2.2 House hold interviews

Household interviews were carried out using a structured questionnaire and responses coded accordingly. The respondent was the woman of the house after the research team unanimously deciding that it was women who bore the responsibility of cooking in the study. On reaching the household introduced themselves and the study then asked the woman for her consent to participate in the study.

2.3 Sampling

The programme offices describe the sampling method that was applied. The survey is using multistage sampling while random sampling was applied in selection at each of the stages. At the Cluster level two districts were randomly selected using a rotary. Similar Rotary was done for all divisions in district for selecting two study divisions and locations. At locations level, all sub locations were included to form the sampling cluster. Equal number of households was sampled for each sub location to achieve the required 36 households per division. A total of 72 per District strict to make 432 households in

the whole study were selected for the study. The sample size taken was the lowest statistically feasible due to the short time available for the baseline survey.

2.3 Data quality control

Each enumerator checked a completed questionnaire on completion and went back to complete any omissions. The supervisor checked each questionnaire on a daily basis for completeness. Supervision was carried out on a daily basis and also repeated at district level by coordinators.

2.4 Data analysis

Data was entered and analysed using statistical package for social sciences (SPSS) computer programme .Frequencies and cross tabs were done for comparison across the districts and clusters.

3.0 EXECUTIVE SUMMARY

The survey was a cross sectional survey carried in six districts in three clusters where PSDA was to implement stove activities. There was a household utilization survey and a detailed sub sample detailed kitchen performance test done in 90 household.

Only 4.8% of households of households were using the improved firewood stove.

Majority of households still use the traditional three stones.

Most common reason for not having liner did not know where to get one, followed by those who find the liner expensive and those that could not get one to buy.

Most of the households (96.7%) were using fuel wood in the study population.

Source of fuel wood in most homes their own trees. In some cases trees owned d by families were not used for firewood.

The average daily fuelwood consumption per person was 1.26kg/person.

4.0 RECOMMENDED STRATEGIES FOR SCALING UP

1. It is important to promote improved stoves to enable more people know their options of .use resources efficiently.
2. Comprehensive information on acquiring liners should be a full package to avoid a situation where people know about the stoves but lack information on where to get or buy the stoves.

3. It is very important for marketing of the stoves to be fully commercialized so as to attract private sector and community groups so to avail stoves in the community all the time.
4. Equipping community with installation skills is necessary so as to address the needs of 8.5% of respondents who never bought stoves for lack of installation skills.
5. Information on the efficiency of the stove as well as opportunity cost will target to educate 27.7% respondents who find the stove expensive. Such information will make them relies the many benefits they get when using the improved stove
6. Fire wood scarcity is a reality among the study population living in the three clusters and own trees production is the most common solution for most households. The project should therefore encourage other actors in the sector to take up promotion efforts in the fuel wood supply side.
7. Use of energy saving devices and energy saving practices need to be encouraged. This is because such devices and practices are known to reduce fuel consumption yet very few households were practicing them in the study area.
8. It may be necessary to investigate further why there was high utilization of firewood in Central despite there being more maendeleo liners, raised fire places.

HOUSEHOLD

STOVE

UTILIZATION

RESULTS

5.0 PRINCIPAL FINDINGS OF HOUSEHOLD STOVE UTILIZATION

5.1 Study population and family size

Household size varied from one to thirteen persons with mean household size standing at six persons. The difference was variation across district was every significant with a Chi-square of $p=000$

Table 2. Study population by districts vs 1999 population census

District	Transmara	Centrl Kisii	Vihiga	Bungoma	Murang'a	Kiambu	Averagel
Household size	7.4	6.1	6.7	6.3	5.1	4.9	6.1
study Population	533	439	476	454	367	363	2632
Total Hhds	4314	6330	11709	7645	8916	14807	53721
population Ppopn 1999census	22372	28024	56146	36247	36643	57359	236791

5.2 Improved stoves utilization

Most households 67.1%(281) in the study area used traditional three stones alone or in combination with Kenya ceramic jiko(KCJ), 4.8% of the households used maendeleo stoves. Muranga districts had highest number of maendeleo stoves while no stoves were found in the selected households in Bungoma and Transmara as shown in Table 2. Raised fire places were a common stove in Kiambu and Muranga. Most (85%) of households had acquired the improved stoves by purchasing and the maendeleo stove price ranged between Ksh. 30 and 800 with an average prize of Ksh.163. Women had purchased most (68.3%) of the stoves, followed by husbands who purchased stoves in 19% households.

Table 3. Type of stove used in the households (Percentage)

Districts	Installed Mandeleo	Three stones	Portable liner	Kenya Ceramic	Raised fireplace	Trench	3 stones & KCJ
							N=432

	liner			Jiko			
Muranga	12.7	33.3	1.38	5.56	26.38	1.38	1.38
Vihiga	9.5	66.7	0	1.38	0	4.16	0
Kisii	4.2	37.5	0	5.56	0	0	26.38
Kiambu	2.7	29.16	0	8.33	12.5	0	34.72
Bungoma	0	87.5	0	5.56	0	0	1.38
Transmara	0	63.89	0	0	1.38	19.44	8.33
All districts	4.8	54	0.2	4.3	6.9	4.3	12.4

5.3 Type of fuel used in households

Majority of households 96.76% of the study house hold were using firewood or firewood in combination with another fuel for cooking.

5.4 Energy saving devices and fuel efficient practices

Only 34.6% of the population used other energy saving devices. Most common devices were thermos flask, fireless cookers and tea cosy. Only few households (2.5%) used energy saving practices such presoaking grains, chopping food, covering food.

5.5 Housewives knowledge of improved stove

75.9% of respondents had heard or knew of the improved stove. Most of them 235 had not acquired one due to various reasons as shown in figure 2. Majority of the respondent report that The highest proportion of respondents reported that they did not know where to find a stove to buy. Other reasons for not having stove included not aware of its importance (2) and that the stove was not suitable for large families (3) while 4 households had not replaced broken stoves.

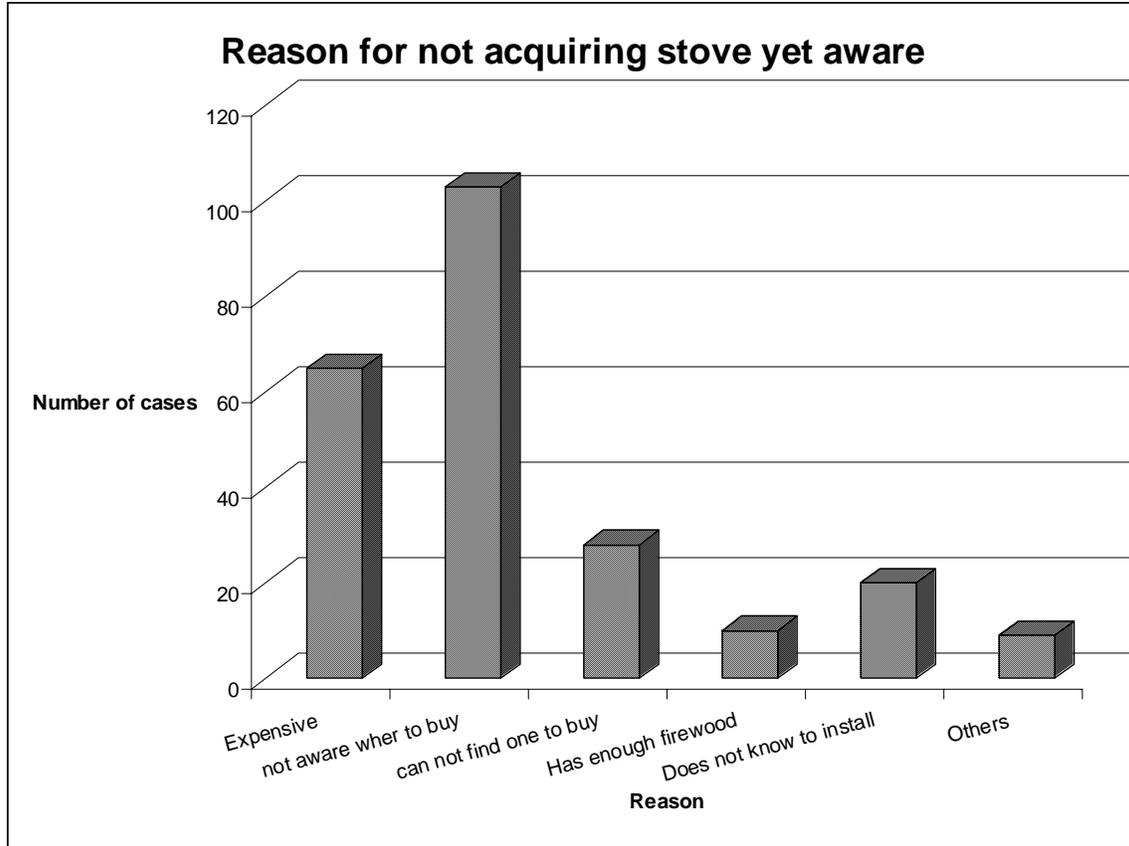


Figure 3. Reasons for not having improved stoves

5.6 Household Fire wood sources

Most(44%) common source of firewood in the households was from the families own trees. 82.4% of households that owned trees used the trees for firewood. Transmara was exceptional with a big disparity between house holds that had their own trees and those that used household-owned trees for firewood. As shown in table 3.

Table 4. Household firewood utilization and possessing trees

N=432

	Transmara	Kisii central	Vihiga	Bungoma	Murang'a	Kiambu	Cluster average
Firewood as most common fuel	94.44	98.6	94.4	94.4	97.22	98.6	96.76
Households that owned trees	76.1	80.6	94.4	81.7	87.5	74.39	82.4

Used trees for firewood	45.2	98.3	88.1	88.9	90.5	83.6	83.3
-------------------------	------	------	------	------	------	------	------

5.7 Firewood collection.

71.4 households collect firewood. Firewood collection is mainly done by women and in some cases women are assisted by boys and girls as shown in figure 3

5.8 Measures to ensure sustainability of fuelwood.

The most common measure undertaken to ensure sustainability of fuel wood was planting trees. The second common method was by buying firewood.

6.0 DISCUSSION

6.1 Improved stove

Majority of households were using traditional three stones for cooking in the study area. Most of them were aware of improved stoves but did not have them because they did not know where to buy the liners. Information on where to get liners then is critical in efforts of scaling up adoption of the stoves. This indicates that a lot of effort is needed in enhancing availability of liners to people who need them. This further justifies the approach of awareness campaigns as a major intervention strategy of the program. It also emphasizes the need for such awareness campaigns to be accompanied by information where to buy stoves and clear information of stove installation. Installation skills had been the problem of 4.6% almost same number to those who had the stove. A bigger

group lacked liners to buy meaning that availability of stoves for sale is impacting negatively on acquisition of the stoves. The other bottleneck to adoption was that the stove was expensive, although with much lower percentage of respondents compare to availability. Most of those who had the stove had acquired it through buying meaning that the stove is on sale. One stove had been acquired by merry go round indicating that this is an entry point for increasing stoves adoption.

6.2 Fuel wood

. Use of the improved stove can therefore save considerable cooking energy in the population. This would also improve sustainability of the scarce resources (firewood). Major source of firewood for most households was own trees and buying. It is therefore important to use the firewood efficiently. The improved stoves if adopted can help family save money and time that can be used for the development of the family.

Availability of family trees for Transmara household had a gender dimension as indicated by one woman group what was abandoning tree plant coz men do not allow women to use trees for fuel rather choose to use the tree as source of income.

Fuel saving devices and energy saving practices were reported in very few households indicating that household in the study area were not deliberately undertaking such energy conservation measures. This could be due to lack of information on the importance of the devices and practices.

KITCHEN

PERFORMANCE TEST

(HOUSEHOLD

FIREWOOD

CONSUMPTION TEST

7.0 PRINCIPAL FINDINGS OF KITCHEN PERFORMANCE TEST (HOUSEHOLD FUEL WOOD CONSUMPTION TEST)

The daily fuel wood consumption per person is 1.29. This is lower than the national figure of 1.5 (Otwobe, 2004). This could have been due to higher number of households using improved stoves (22.4) in this purposively selected sample, where the enumerator chose five households within a walking distance. Kiambu and Muranga districts recorded highest per capita household firewood consumption. Energy saving practices were reported in very few households.

7.1. Introduction

The survey was carried out in three clusters namely Transmara, Western and Central. The Transmara cluster composed of Transmara and Central Kisii districts; Western cluster composed of Vihiga and Bungoma districts, whereas Central cluster composed of Murang'a and Kiambu districts. The respondents (sample size) per cluster were equal (15) and were sampled from one location within one division in each district. There were ninety respondents in all.

7.2 Household size

Household size varies from one to thirteen persons with mean household size standing at six persons. The difference in variation across district was very significant with a Chi-square of $P=0.000$ and was distributed as shown in table 1.

Table 5. KTP study Population

District	Transmara	Central Kisii	Vihiga	Bungoma	Murang'a	Kiambu	Average
Household	5.8	6.4	6.7	6.9	5.3	4.6	5.94

size							
Study Population	87	96	94	110	94	69	550

7.3 Fuel used for cooking

All the households use firewood as a source of fuel energy for cooking except for 1.1% of the households that used a combination of charcoal and paraffin. Various type fuels were reported to be used either independently or in combinations, namely; firewood, charcoal, LPG gas, paraffin and maize-cob. Firewood was reported as the fuel of choice with 57.8% of the households using it solely, while 34.4% of the households used firewood and charcoal in combination. Paraffin, maize-cobs and LPG gas were reported to be used only in combinations with other fuel energy sources.

7.4 Improved stoves utilization

22.4% (19 households) were using the improved fuel wood stove. The traditional three stone was reported to be the commonly used with 63.5% of the household using it. The Kenya ceramic jiko was the least commonly used stoves (2.4%) by households.

7.5 Daily Fire wood consumption

The average daily firewood consumption range was 0-16.44 kg per household. It was noted that the bigger the households seemed to be efficient users of firewood than smaller ones.

The average daily firewood consumption per person was 1.29kg/person. Use of maendeleo stove had considerable reduction on amount of firewood used.

Central had fuel consumption rate above the 1.5 existing country levels. There was a reduction in per capita fuel wood consumption in households using maendeleo stoves in comparison with those using three stones in the same district.

Table 6. Amount of Fuel wood consumed per person per day by Districts.

Cluster	Traditional three stones	Maendeleo
Transmara	1.182	1.028
Kisii central	1.186	0.586
Kiambu	1.885	1.47
Muranga	1.617	1.13
Vihiga	1.374	1.191
Bungoma	1.126	0.455
Average	1.395	0.976

7.6 Energy saving practice used when cooking:

A number of energy saving devices and practices were reported to be used when cooking. They were used or practiced either solely or in combinations. Presoaking, covering and chopping/cutting to smaller pieces were reported by the highest proportion of households (23.4%) with an average size of 6.44 persons as their preferred combination method of energy saving practice. Covering was reported by the highest proportion of the households (11.7%) with an average family size of 5.22 persons as their preferred sole method of energy saving practice. Use of fireless cooker and flask were reported by small proportion of households (1.3%) with an average family size of 4.00 and 6.00 persons, respectively as sole saving practices.

Discussions of house hold firewood consumption

The average average fuel consumption was lower than the country level of 1.5kg/perso/day. Use of improved stove resulted in reduction in firewood used in a household.

Districts of central cluster had highest per capita firewood consumption. This could have been caused by the high frequency of Githeri (maize and bean mixture) in the diet. The families were also relatively smaller and had more frequent meals. Lari division is a cold place and there some firewood could have been used for space heating.

Table 7. Overview of key findings

Findings	Trnsmara	Central.Kisii	Bungoma	Vihiga	Muranga	Kiambu	Average
Hhd size N=432	7.4	6.1	6.7	6.3	5.1	4.9	6.1
Hhds using Improved stoves N=432	0	4.2	9.5	0	12.9	2.7	
Hhds using 3 stones N=432	75	91.5	83.3	91.7	43	70.8	87.5
Hhds aware of stove and need of conservation N=							
Hhd lacking information on where to get, install or buy IS N=							
Kitchen Performance test(household firewood consumption Average firewood consumption per persn per day N=90							
Energy Saving Practices N=							
Most frequent food cooked N=90							



Figure 5. Western and Transmara clusters survey teams at Jamidas hotel, Kakamega

SURVEY TEAM MEMBERS

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APPENDIX A: RESEARCH QUESTIONNAIRES

MINISTRY OF AGRICULTURE PSDA IMPROVED STOVES SURVEY

Introduction and Consent information:

My Name is -----from the Ministry of Agriculture (MOA).The MOA is carrying out a study stoves in this area so as to plan for fuel and environmental conservation. You were randomly selected to participate in the study. All The information given will be treated with confidentiality and be used for the purposes of the study only. Do you wish to participate in the study?

Thank you very much!!

QUESTIONNAIRE ONE: HOUSEHOLD STOVE UTILIZATION QUESTIONNAIRE

Beginning time.....

Date:.....District.....Division.....

Location.....Village.....QNO___ ___ ___

Name of Enumerator.....

Name of Responent.....

1. Who is the household head 1=husband 2=self 3=other (specify)
2. What is the occupation of the household head (What kind of work done mainly) 1=House wife 2= farming 3=Herding 4=salaried/civil servant
5=Business man 6=Casual labourer 7=self employed 8= others (specify)
3. How many people are in the household? (no).....(define house hold to include all the people who eat from the same pot.)

Sn. No	Name	Sex 1=male 2=female	Age (in years)	Years of schooling	Relation to HH head	Occupation
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10						

Years of schooling	Relationship to household head	Occupation
99=Below school age or preschool 1=1yr 2=2yr 9=FORM 1 12=Form 4 13=Post secondary Education	1=Household head 2=Wife 3=son 4=Daughter 5=Parent 6=Brother 7=Sister	1=House wife 2= farming 3=Herding 4=salaried/civil servant 5=Business man 6=Casual labourer 7=self employed 8= others (specify)

4. What Fuels do you mainly use to cook 1=firewood 2= charcoal 3=Gas
4= Electricity 5= Agricultural waste products Specify
6= paraffin 7=saw dust 8= any other specify
5. If firewood, what is the source? 1=Public forest/bush 2=Own farm
3=Borrow 4= buy 5=Other private people
6. Does household own any trees? Yes..... No.....
7. If yes, are trees used for firewood?.....
8. Explain who has control over the trees.....

9. What measures have you taken to ensure sufficient fuelwood/ domestic energy supply? 1=planted trees 2= energy saving stove 3= can buy fuelwood 4= avoid certain foods 5= nothing.

10. What type of Stove do you mainly use to cook? 1=Three stone.
2=Installed liner 3=Portable Liner 4=Kenya ceramic Jiko(KCJ) 5=ordinary metal jiko 6= solar box cooker 7=saw dust jiko 8= solar cooker 9= pot stove
10=trench (hole) fireplace

11. Do you use any other fuel saving device? 1=fireless cooker 2=tea cosy
3= other (specify)

If House hold has no improved stove

12. Have you ever heard of the improved fuel wood stove? Yes.....

No.....

13. if yes, why haven't you acquired an improved stove? 1=Expensive 2=cant find one to buy 3 = Do not know where to get one 4= there's enough firewood
5=Do not know how to install one 6= others, specify

For those house holds with improved stove ask question

14-15

14. How did the household acquire the stove 1=Purchased for ksh.____ 2=Gift
3=Borrowed 4= Merry go round 5=Donation 6=inheritance 7=
improvised 8= other, specify

15. If purchased by who? 1=self 2=Husband 3=Parent mother
4=Father 5= Other(specify) 6= donation from church organization

For all households

16. How much time is spent looking for firewood?.....hours

17. who collects firewood? 1= men 2= women 3= boys 4= girls

18. Is the time spent always the same in the last 3 years

2003..... 2004..... 2005.....

19. How long has the household had the improved stove? Since the year _ _ _

1= For _ _ Months 2= For _ _ years 3= Fordays

20. What is the condition of the stove.....

.....
....

(Request to see the fire place for observation)

21. Any damage, wear and tear? Explain

22. Does the household use traditional three stone stoves used? 1= Yes 2=No

23. If Yes which one do you use how often 1= More than 50% of the times

2= Less than times for improved stove 3= For special occasions (specify) 4=

For special foods (specify)

24. Starting with the most important reason tell me why you still use the three stones while you have the improved stove.

1

2.....

3.....

25. Please tell me any specific disadvantages/problems of the improved stove starting with most important.

1

2.....

3.....

26. Would the household consider buying one of the stoves / cookers? 1=yes

2=No

27. What are main expenses of the household income? 1 = School fees 2 =

Household consumables 3 = Domestic fuel 4 = Lighting

28. How much proportion of the house hold income is used on cooking?

Food	Approximate proportion of household income spent 1=25% 2=less than or 50% 3=50-75% 4=Greater than 75% 5=None 6=All yet not enough 7 = Occassionally 8= Do not buy
School fees	
Household consumables soaps, cooking fat etc.	
Domestic fuel	

-charcoal -firewood	
Lighting	
Medical	
Clothing	

Thank you very much for your answers,

Now I will ask you about People Living With HIV/Aids(PLWHA) in this community in relation to the stoves

29. Are you aware of PLWHA) (Inquire of local term and use from here onwards)

1=yes 2=No

30. How do you gauge the HIV/Aids problem in this area? 1=big 2=small
3=Don't Know 4=other specify

31. What problems do you think the PLWHA (affected and infected) have with regards to firewood or other cooking fuels?

1=Getting firewood, Explain.....

2=Cooking Explain.....

3= Other Explain.....

32. What is the community doing about PLWHA.....

33. Can fuel saving technologies assist them? Yes..... No.....

34. If yes in what ways, starting with the best way

1..... 2.....

35. Other comments.....

.....

....

.....

....

Ending Time_____ -

MINISTRY OF AGRICULTURE PSDA IMPROVED STOVES SURVEY

Introduction and Consent information:

My Name is -----from the Ministry of Agriculture (MOA).The MOA is carrying out a study stoves in this area so as to plan for fuel and environmental conservation. You were randomly selected to participate in the study. All The information given will be treated with confidentiality and be used for the purposes of the study only. Do you wish to participate in the study?

Thank you very much!!

**QUESTIONNAIRE TWO: HOUSEHOLD FUEL CONSUMPTION TEST
QUESTIONNAIRE**

Cluster:

District:..... Division.....

Location.....Village

1. Name of person carrying out survey.....
2. Name of respondent.....
- 3 Family size.....
4. Actual number of people normally cooking and eating together

Sn. No	Name	Sex 1=male 2=female	Age (in years)	Years of schooling	Relation to HH head	Occupation
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10						

Years of schooling	Relationship to household head	Occupation
99=Below school age or preschool 1=1yr 2=2yr	1=Household head 2=Wife 3=son 4=Daughter	1=House wife 2= farming 3=Herding 4=salaried/civil servant

3=3yrs 8=8yrs 9=FORM 1 12=Form 4 13=Post secondary Education	5=Parent 6=Brother 7=Sister 8= Grand child 9= House help	5=Business man 6=Casual labourer 7=self employed 8= others (specify) 0= Never been to school
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5. What fuels do you use for cooking: 1= Firewood 2=Charcoal 3= Firewood and charcoal

4. Paraffin 5. Other specify
6. For firewood which type of stove 1=Three stones 2=Trench
3=Maendeleo liner 4=Other Specify
7. If using both, for which types of food is firewood preferred?

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... and for which types of food is charcoal preferred?

.....

8. Tell me some ways energy saving practice that you use while cooking? 1=Pre-soaking grains 2= Covering 3= Cutting into small pieces 4=Use fireless cookers 5= Others, specify

Daily firewood consumption record

Day	Time	Date	Weigh the firewood That the household will use for the next 24 hrs in at a specific time(Same time every day eor eight days)			Firewood remaining at end 24 hrs of day=(b) kgs	Amount of Firewood used per day = (a -b)	Remarks	
			Amount in kgs						1=Dry 2=Not dry
			1 st reading	2 nd reading	Average weight =(a)kgs				
1									
2									
3									
4									
5									
6									
7									
8									

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Day	Time	Date	Weigh the charcoal in house (kg			Weigh the charcoal remaining at the end of 24 hrs				Remarks
			Amount in kgs			Amount in Kgs				
			1 st reading	2 nd reading	Average weight (a)	1 st reading	2 nd reading	Average (b)	Charcoal used per day (a-b)	
1										
2										
3										
4										
5										
6										
7										
8										

Daily cooking diary

Day	Date	Times	Type of cooking pot 1= Sufuria 2=Clay pot 3=Other, specify	Description of food eaten
1				
2				
3				
4				

5				
6				
7				
8				

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