

# Social Factors Influencing Uptake of Solar Fuel Technology in Refugee Camps; A Case of Kakuma Refugee Camp in Kenya.

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## Research Question: Do Social Factors influence Uptake of Solar Fuel Projects in Refugee Camps?

**SIGNIFICANCE:** The study will provide insight into implementing solar fuel projects among refugees, which would boost environmental conservation efforts, nutritional, health, Refugee Protection Programmes and achievement of SDGs.

### INTRODUCTION

Most refugees in camps use firewood for domestic fuel needs, but it's usually scarce. In Kakuma, refugees resort to cutting down vegetation to meet fuel needs, or barter their meagre food rations for charcoal. Others burn plastic jerrycans, with serious harmful effect on not only to environment but also their nutritional and health status. Many solar fuel projects have been initiated in the camp since 2000 but solar fuel adoption has remained paltry and not as remarkable as anticipated. Why?

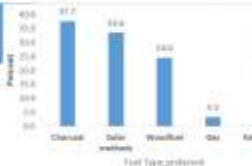


This research, done in Nov. 2016, investigates social factors influencing uptake of solar fuel projects in Refugee Camps – a case of Kakuma Refugee Camp,

### FUEL TYPES MOSTLY USED BY REFUGEES

**Charcoal**, is the most preferred option due to its: Speed of cooking; Ability to cook all types of food; Flexibility; Non-effect on taste; No need for training; Availability.

**Other alternatives** are firewood, solar, gas & kerosene.



**2. Solar fuel;** this is the 2<sup>nd</sup> most preferred option at 33.6%.

### Why solar fuel is preferred

- Its Clean, doesn't smoke/emit soot or blacken cooking pots.
- Time saving and safety aspects; trips avoidance, no need for women to venture into bushes.
- Unlimited, cheap, renewable; environmentally friendly

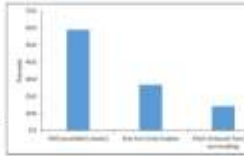


### Issues mentioned as solar fuel's drawbacks;

- Lack of O&M follow-up- 99% of kits not working, 84%- broke down- 11% were stolen, 5% swept away by floods/blown away by Kakuma strong winds;
- Inability to use; indoors, for large households,
- Inability to cook all food types
- Slow cooking,
- Method not suitable to use indoors
- Safety and security challenges-while using the kits
- Low beneficiaries participation and awareness

### Mode of fuel acquisition

- Over 59% cook with firewood rations from aid agencies and 41% buy locally or fetch from the surrounding bushes.
- Fuel rations are inadequate- supplemented by buying or cutting neighboring vegetation's, and/or barter exchange.



### Most Common Food Type in the camp:

- ugali/posho, followed by pepper foods, cowpeas and rice and beans in that order.

### Time and cost of accessing fuel in Kakuma

- On aver. 3hrs. are spent per family/day.
- Some families spend up to USD150/m



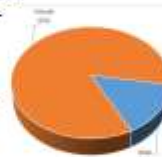
**Beneficiaries experience in cooking different foods with** About 44% said that solar fuel technology was not convenient for foods such as pepper food, ugali, chapatis and kisira; 56% highlighted no issues to use it.

### SOCIAL DETERMINANTS & SOLAR FUELS

#### 1. THE GENDER THAT COOKS

Most of cooking is done by women and girls (85%). Men take up only 15% of domestic cooking, majority (55.6%) preferring solar fuels to other substitutes, compared to women 29.8%.

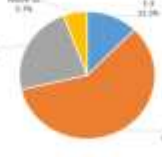
Pearson's Chi-square  $p=0.029$ , thus there is a significant association between gender and the most preferred fuel type.



**2. MARITAL STATUS;** Most refugees with using solar fuel were married (72.1%). However no significant association between marital status and solar fuels adoption as Chi-square  $p\text{-value}=0.58$ .

#### 3. HOUSEHOLD SIZE;

The largest household has 15 pax. From Chi-square there was no significant association between household sizes and solar fuels adoption.



#### 4. AGE;

Over 98% of Kenya's refugee population fall below 60 years (UNHCR, 2016). However data showed was no significant association of age and solar fuel preference.

#### 3. BENEFICIARY PARTICIPATION & O&M

One way to generate solar fuel renaissance and counter communal resistance, in a culturally-embedded practice like cooking, is by direct user involvement. Inadequate user contribution, limited O&M, lack of follow-up and user training were found to have significant an adverse affect on solar fuel adoption. A new technology can't be introduced overnight, thus a sustained financial, time and human resources are needed to raise awareness sensitize users on use. A dedicated Kakuma-based agency to train and follow-ups on O&M would helpful to charm refugees for solar fuels. Community leaders and refugees who have displayed dedication to behavioral in

#### 5. PREFERRED PLACE OF COOKING;

Cooking is mostly done indoors. Only 38% of cooking was taking place outdoors, while 16% of beneficiaries said they find problems cooking outdoors because of; insecurity, harsh weather conditions, fear of poisonous and stinging insects and animals—spiders, scorpions and snakes. Some prefer cooking in an enclosed place/ room for privacy. This would therefore be a disincentive to solar fuels since cooking with sun must take place outdoors under sunshine.

**6. TIME FOR COOKING;** the data showed no significant association between preferred cooking time and the solar fuel adoption as  $p\text{-value}>0.05$

**7. SECURITY AND SAFETY;** Almost half of respondents suffered some form of insecurity or injuries related to solar fuel use. A third reported thefts of their cooking kits while 10%

talked of loss of taste on food. These are a distaste to users on solar fuels. Over 2/3 highlighted health problems like eye irritation and respiratory problems, from use firewood.



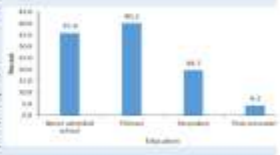
However chi-square  $p=0.554$  thus no association on security issues and solar fuels acceptance.

#### 9. BENEFICIARY PARTICIPATION

About 3 of every 4 beneficiaries said they were never involved in development of solar fuel projects. About 25% reported having had some form of participation, and were observed to have a higher rating of solar fuels compared to those who hadn't. Chi-square gave  $p\text{-value}=0.011$ , meaning that there is a strong association between beneficiaries' participation and solar fuels adoption

#### 9. EDUCATION LEVEL

Solar fuel preference was higher among respondents with secondary/post-secondary schooling. The chi-square  $p=0.016$  indicated a significant association between beneficiaries' education level and solar fuel preference in Kakuma camp.



### CONCLUSION & RECOMMENDATIONS

It's interesting to note that Solar Fuel is the 2<sup>nd</sup> most preferred fuel by refugees after charcoal. Socio-cultural issues influence solar fuels adoption.

**1. FIRE PLACE;** Reluctance by beneficiaries to cook outdoors in daytime retards the solar fuels adoption. Fire-place is an important social venue in Kakuma. A more efficient and a wider use could be achieved by user sensitization to vary cooking times and place.

**2. GENDER;** A higher percentage of men than women prefer solar fuels compared to other alternatives. However few men participate in domestic cooking, thus making the adoption gets suppressed. Advocacy at community level would be useful to promote the adoption of the fuel.

embracing solar energy would be ideal to start with to show that solar fuels works as well as other fuel types.

**4. LEVEL OF EDUCATION;** Additional years of schooling above secondary level showed a higher refugee acceptance of solar fuels compared to others. Education creates awareness, eliminates stereotypes and can serve as a catalyst in promoting gender parity in household roles. It also reduces negative perceptions and distortions on solar fuel use. More education and enlightening refugees on the low cost, greener fuel is needed to spur its adoption.