



**Focus Group Discussion Report for
Dodoma Urban and Rural Areas of Hai District,
Kilimanjaro Region, Tanzania**

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TaTEDO



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1. Executive Summary

The report presents one part of the detailed in country research carried out to explore the cooking practices for modern energy cooking services in Dodoma and Kilimanjaro, Tanzania. The aim of this study is to gain a deeper understanding of how people in Kilimanjaro and Dodoma Regions of Tanzania are currently cooking and how they aspire to cook.

In particular, the objectives of the study are:

- To assess the compatibility of current and aspirational cooking practices with clean cooking services.
- To identify design modifications and marketing strategies that can enable the generic concept of modern energy cooking services to evolve around the needs and aspirations of cooks in Tanzania.

The information in this report was obtained from literature review, group discussions with participants and experience obtained during cooking diary surveys. According to discussions from each group, domestic activities in households for both Dodoma and Kilimanjaro included food preparation and cooking, washing dishes, fetching water, securing cooking fuel and shopping for food stuffs and other domestic items used in the kitchen. All these activities are mostly performed by women with the exception of two; **securing cooking fuels which is mostly done by men** and shopping which is more or less shared equally between household members. Fuels for cooking in these two areas are bought from vendors especially commercial fuels like LPG and charcoal. Some firewood for Kilimanjaro is collected from household farms, river valleys or natural forests while bio-wastes (maize cobs and saw mill wastes) are obtained from harvested agricultural crops and saw mill factory in Hai District. **Firewood collection is role of women** in both periphery of urban Dodoma and rural areas of Hai District in Kilimanjaro region

The findings from focus group discussions (FGDs) in Kilimanjaro indicated that the social division of labour in most households is such that men bring either money or food to their families while women do the cooking. The cultural differences, recipe types and styles of cooking means all households cook in their own ways. The food types cooked can be divided into common foods which are cooked in both areas (Dodoma and Kilimanjaro) and foods which are specifically cooked and consumed in each area respectively.

The main fuels used for cooking are biomass fuels. Charcoal is used by a large number of households in Dodoma while firewood is the main cooking fuel used by households in Kilimanjaro. Other fuels used in Dodoma are LPG and firewood and in Kilimanjaro are LPG, charcoal, maize cobs and sawmill wastes. Firewood is purchased at a retail price of around TZS 3,000 per bundle which can cook for single day. Some firewood in Kilimanjaro is collected from household farms while in Dodoma it is fetched from nearby woodlands at periphery of the city. Charcoal was expensive in both Dodoma and Kilimanjaro Region. A charcoal bag is sold at a price of TZS 60,000 in Dodoma and TZS 65,000 in Kilimanjaro, which can be used for one month by household. The average LPG price is TZS 25,000 for a cylinder of 6 kilograms and TZS 55,000 for a cylinder of 15 kilograms.

Due to the high prices of LPG it is used to cook light foods, but it cannot be used to cook heavy foods like Makande, and Beans. This suggests the necessity of introducing the EPCs to lower the time of boiling and cooking those foods. Most participants in Dodoma and Kilimanjaro declared that they have previously tried to use electricity by using hot plates but they were expensive and sometimes

not safe. Some of them received electric hot plates from their children, but they decided to put them in their stores due to the high cost of using them to cook.

Cooking with the EPC has influenced the behaviour of people in the kitchen and households. Participants discussed changes in cooking behaviours such as: starting cooking later because of the speed of cooking with EPCs, cooking while doing other activities since it does not burn food, not needing to precook and then refrigerate foods because an EPC is so fast to cook that the whole meal can be made at the time its needed. According to the evidence from participants, some foods cooked by EPCs were delicious and their taste was judged as better.

The participants from Kilimanjaro and some in Dodoma accepted that they prefer to cook all foods found in their areas in the EPC. The only factors which will prevent them from using EPCs and electricity is power blackouts and cooking foods which cannot be cooked in EPCs.

The FGDs have confirmed that there is a strong market potential for EPC in Dodoma and Kilimanjaro, Tanzania. The convenience of being able to turn on the EPC and control its functionality by moving the rotary button was highly valued by the majority of participants. The evidence from these discussions indicates that LPG is currently the fuel which has been accepted by most households in Tanzania, but once introduced to cooking with electricity, it is an attractive alternative due to the low cost of cooking.

2. Introduction

2.1 Country Energy Overview

The United Republic of Tanzania in Eastern Africa has a total area of 945,087 km². The country has a tropical type of climate which is divided into four main climatic zones notably: the hot humid coastal plain; the semi-arid zone of the central plateau; the high-moist lake regions and the temperate highland areas. The Government of Tanzania is composed of 26 administrative regions, 98 districts, 114 councils and 12,317 villages. Almost about two-fifths of the country's population is engaged in agricultural production. The major food crops are corn (maize), rice, sorghum, millet, bananas, cassava (manioc), sweet potatoes, barley, potatoes, and wheat (NBS and OCGS 2021).

The population of Tanzania based on interpolation of United Nations data stands at 63.46 million inhabitants in the year 2022. According to the Energy Access and Use Situation Report (2020) 78.4% of the population have access to electricity overall (69.8% in rural areas). However, only 37.7% of households are connected to electricity and there is a large disparity in connectivity between urban areas, with 73.2% connected to electricity compared to rural areas where only 24.5% of households are connected (NBS and REA 2020). There are also large differences with the distribution of access to electricity across regions in Tanzania. The population of Dar es Salaam all have access to electricity (100%), and other regions such as Kilimanjaro (93.6%), Mwanza (89.9%), Mbeya (89.0%), Mara (87.7%), Coast (85.8%), and Geita (84.4%) have a high percentage of the population connected to electricity (NBS and REA 2020).

Tanzania has a variety of potential energy resources, such as biomass fuels, hydropower, natural gas, coal, uranium, wind, geothermal and solar which are yet to be fully exploited. The total primary energy use pattern is dominated by biomass fuel and has almost doubled in the last decade. Cooking energy data shows that 63.5% of households in Tanzania are using firewood as the main source of energy for cooking, followed by charcoal (26.2%), Liquefied Petroleum Gas (5.1%) and electricity (3%) (NBS and REA 2020). About 76.6% are mainly using electricity for lighting (ibid).

Rural Areas of Hai District, Kilimanjaro Region



The Energy Access and Use Situation Report (2020) stipulates that 26 million m³ of firewood is consumed in rural areas, and of this, 24 million m³ is used for household cooking and 2.03 million m³ for rural small and medium-sized enterprises (ibid). 14.4 million m³ is used as charcoal, mainly in urban areas (ibid). In 2012, the majority of biomass was used in households (90%), and only 4% of the biomass consumed across Tanzania was sustainable (Ministry of Energy and Minerals 2015b). The high proportion of household energy consumption is explained by the use of inefficient stoves for cooking with firewood and charcoal. The remaining (10%) is used by home-based enterprises and commercial, institutional and industrial sectors. The government is struggling with added pressure

on energy consumption as the country's economy diversifies and shifts away from agriculture, making the low access rate and other supply limitations obstacles to economic growth (IRENA 2017).

The Renewables Readiness Assessment for Tanzania, published by IRENA in 2017 elaborates on the development of the electricity sector in Tanzania (IRENA 2017):

“Electricity is mainly generated from hydropower, oil and natural gas. Costly oil products account for around one-fifth of power generation and are mainly required for off-grid applications and emergency on-grid power supply. The electrical supply varies in times of drought and is highly dependent on hydropower generation, leading to rolling blackouts. What is more, a quarter of power produced is lost due to the state of the grid infrastructure. The unreliability of power supply has had a negative impact on the development of Tanzanian industry. Although Tanzania has excellent wind, solar, geothermal and biomass resources for power production, only 4.85% of non-hydropower renewable electricity was considered in the Electricity Industry Reform Roadmap to 2025.

“The country's abundant renewable energy potential offers the possibility to overcome some of the challenges faced by the energy and power sector in a cost-effective way. This would lead Tanzania towards economic growth that is sustainable.

“A renewable energy zoning study carried out by the International Renewable Energy Agency (IRENA) and the Lawrence Berkeley National Laboratory (LBNL) in 2015 found that the oil-based power in Tanzania can be displaced by wind power due to the high correlation of wind resources. According to this study, an examination of the characteristics of the least-cost energy system for Tanzania found that utility-scale for solar PV and wind projects could reach 3.7 gigawatts (GW) and 1.9 GW by 2030, alongside 694 megawatts (MW) of gas-fuelled power plant investment already in the pipeline. The report estimated that the overall share of renewable in electricity production, including large hydropower, could reach 78% by 2030. This requires investments of USD 11.4 billion in generation and USD 6.7 billion in transmission and distribution investment between 2013 and 2030. The average generation cost would fall to rate of 17% between 2013 and 2030. This calls for a revision of the existing electricity master plan as well as a roadmap to realise the desired least-cost power system investment strategy.

“On the policy and regulatory framework side, the draft Electricity Systems Operations Act 2016, under approval, gives priority for dispatch to the electricity generated from renewable energy sources and indigenous sources. However, this act does not specify guidelines for the power forecast period. Despite the existence of feed-in tariffs and small power purchase agreements (SPPAs) for grid-connected projects, renewable-based power generation is unattractive to private investors. This is due to the weak financial position of TANESCO, the sole off-taker, and the government's inability to guarantee payment of TANESCO defaults” (IRENA 2017)

2.2 Context of the Potential Landscape Change by Modern Cooking Services

The use of biomass (or solid bio-fuels) for cooking is the daily pattern for 85% of the population in Tanzania (Ministry of Energy and Minerals 2015a). This pervasive use of solid fuels including wood, coal, straw, and dung and traditional cookstoves results in high levels of household air pollution, extensive daily drudgery required to collect fuels, and serious health impacts. J. Leary et al (2019) note: ‘Cooking is mainly done on traditional, low-efficiency stoves that use biomass fuels that are produced locally through inefficient, informal and uncontrolled value chains and with basic, low-yield technologies’ (Leary et al. 2019). Extensive and inefficient use of those fuels combined with unsustainable harvesting practices is the single largest cause of depletion of natural forests in the

country. The adverse socio-economic effects of the current practices are partly caused by the lack of access to sustainable cooking solutions, a poverty trap that creates high barriers to economic development.

Alternative fuels and appliances that are suitable for domestic clean cooking are available but have been limited by acceptability from the community because of unawareness of those cooking appliances. The different alternatives such as LPG, ICS, kerosene and biogas represent different improvement potentials and are important parts of the solution. LPG represents lower long-term average cooking costs for households than ICS, but it has logistical challenges; dependence on the import of LPG influences the level of energy security of this option and requires higher investments for users. Toby D. Couture and David Jacobs in their report 'Beyond Fire: how to achieve electric cooking (2019)' outline some of the challenges of relying on LPG, including high price volatility, greater geopolitical and related risks, and supply chain challenges. They conclude that although '*LPG may be seen as a transitional fuel; it is arguably not, however, a long-term solution to challenge the achievement of sustainable cooking*' (Jacobs and Couture 2019).

Electricity is one of the cleanest cooking solutions and if used in efficient appliances will be affordable to most people, even poor segments in the community, if financing is carefully considered. The challenge at the moment is low awareness of the type of modern energy appliances and services as a barrier to efficient cooking and appropriate business models for reaching the majority of the population in the country.

2.2 Introduction of Modern Cooking Services

Modern energy, particularly electricity, plays a key role in rural development. Concerning the country's goal of achieving a small and middle industrialized economy, access to affordable, reliable and safe electricity can greatly improve food, education, and health services, and improve opportunities for income generation.

Increasing the pace of electricity connection, especially in rural areas, is one of the fundamental principles of the Rural Energy Agency (REA). The 2020 Energy Access Situation Survey results show a significant improvement in electricity connection at the household level in both rural and urban areas of the Tanzania Mainland since 2011 (NBS and REA 2020).

The National Energy Policy is focusing on a transition to modern cooking fuels and technologies, moving away from the use of biomass for cooking. The policy includes a reference to cooking and biomass consumption under the Electricity Sub-sector and only addresses an ambition for transition to modern fuels. Specifically, the relevant objective is to improve the quality of life through the use of modern fuels and the associated policy statements include; i) enhancing fuel switch from wood fuel to modern energy and (ii) facilitating the adoption of appropriate cooking appliances to promote alternatives of woodfuel (Ministry of Energy and Minerals 2015a).

J. Leary et al in the Policy and National Markets Review for eCook in Tanzania (2019) explore the various incentives the government of Tanzania has provided, such as tax relief and results-based financing, to stimulate the use of LPG in the country. The report elaborates (drawing on (Ministry of Energy and Minerals 2015a)): '*Over the past ten years, the LPG supply for household cooking has increased significantly. The total volume of LPG imported in the financial year 2010/11 was 24,470 MT compared to 69,148 MT in the financial year 2014/15. The trend shows that the LPG market is growing rapidly, especially in urban centres*' (Leary et al. 2019).

3. Objective

The aim of this study is to gain a deeper understanding of how people in Kilimanjaro and Dodoma Regions of Tanzania are currently cooking and how they aspire to cook.

In particular, the objectives of the study are:

- To assess the compatibility of current and aspirational cooking practices with clean cooking services.
- To identify design modifications and marketing strategies that can enable the generic concept of modern energy cooking services to evolve around the needs and aspirations of cooks in Tanzania.

4. Methodology

FGDs were carried out in Dodoma and Hai District, Kilimanjaro Region to gain further insight on how people in these areas currently are cooking and how they aspire to cook. Participants of the FGDs in Dodoma came from different Community Based Organisation (CBOs) working in various wards such as women groups, MFIs, etc while those in the FGDs in Kilimanjaro came from rural areas of Foo and Wari Villages in Machame, Hai District. A total of 40 individuals from 24 respective households in Kilimanjaro and Dodoma regions participated in these FGDs.

Qualitative data were collected through FGDs and key informant interviews. A series of questions were designed to guide the discussion by using checklist of questions (Appendix 1). However open dialogue was used when unexpected issues were raised up by the participants. Both existing cooking and modern cooking practices dominated the discussions. The demonstration of Electric Pressure Cookers (EPCs) were undertaken during each session, inviting comments from the audience on how compatible the device was with the current and aspired cooking practices.

The participatory sessions involved a live cooking demonstration of popular local foods with EPCs. Each group demonstrated cooking of main dishes from their areas. Foods cooked for Dodoma were Makande, Ugali, Rice, Meat and Beans while Kilimanjaro participants cooked Banana, Wali, Ugali, Meat, Beans and Vegetables.

Various pictures and actual cooking appliances were presented and discussed by participants (traditional woodfuel cookstoves, gas stoves, hot plates, rice cooker, microwaves and EPC) during each session of FGDs, inviting comments from the audience on how compatible the device was with the current and future cooking practices. The issue of cultural differences in each area was also considered because Dodoma has multi-cultural communities while rural areas of Hai District have community with similar cultural practices in food preparation and cooking.

5. Results

5.1 Gender Roles

According to discussions from each groups, domestic activities in households for both Dodoma and Kilimanjaro included food preparation and cooking, washing dishes, fetching water, securing cooking fuel and shopping for food stuffs and other domestic items used in the kitchen. All these activities are mostly performed by women with the exception of two; securing cooking fuels which is

mostly done by men and shopping which is more or less shared equally between household members. Fuels for cooking in these two areas are bought from vendors especially commercial fuels like LPG and charcoal. Some firewood for Kilimanjaro are collected from household farms, river valleys or natural forests while bio-wastes (maize cobs and saw mill wastes) are obtained from harvested agricultural crops and saw mill factory in Hai District. Firewood collection is role of women in both periphery of Dodoma Urban and rural areas of Hai District in Kilimanjaro region.

The findings from the FGDs of Kilimanjaro indicated that the social division of labour in most household men bring either money or food to their families while most of women do the cooking. Participants said that when a man is getting married to a woman, they always say, we are looking for 'jiko' (cook), it mean they are bringing in their household a person who can cook foods. It mean inability to cook, is disqualification of getting married in Kilimanjaro. Seldom do men cook even when there are at home due to culture and norms. Only when the woman is sick or travelled does man cook; they all agree that with Electric Pressure Cookers men might be willing to cook.

In Machame, **participants also declared that men do not cook because of social norms and will be socially embarrassed and controlled by women.** Occasionally, male and female kids help their mothers to cook. However, in Dodoma there were some households where the men did some cooking especially when there is clean cooking and cooking of soft foods like tea, porridges, milk, etc. However, all groups agreed that men do not have much skills of buying and preparing foods. Men do not know even how to bargain when they buy foods (it means they fetch smaller amount of food from the market with the same food budget compared to women). Therefore, women prefer and are happy to buy and cook themselves.

5.2 On Taste and Types of Food

The cultural differences, recipe types and styles of cooking makes every households cook in their own ways with various tastes. The food types cooked can be divided into common foods which are cooked in both areas (Dodoma and Kilimanjaro) and foods which are specifically cooked and consumed in two areas respectively. The common foods are as shown in the table 1 hereunder:

Table 1: Common Foods Cooked and Consumed in Dodoma and Kilimanjaro

| Food | Description |
|--|--|
| Legumes(Palse) (Maharage, Kunde, NjuguMawe, etc) | Grain legumes are re used in Dodoma are beans and cow peas. Pigeon peas and peanuts are mostly obtained in Dodoma. These grains are boiled and beans stew is made for eating with other starchy foods i.e. Ugali, rice, etc. |
| Makande | The dish is cooked by combining maize with beans which are sometimes soaked overnight and then cooked until they become soft and then cooked by coconut milk or oil, tomatoes and onion. There two types of Makande. One is mixed with vegetables and another flavoured with ginger, cumin and cardamom. |
| Ugali | Ugali is a stiff porridge made from maize flour (corn meal). This dish is usually served with whatever meat is available, mashed vegetables, stews, or sour milk. |
| Pilau | A combination of meat stew and rice. May use meat stew/stock pre-cooked on a previous occasion, or may cook the meat especially for this dish. May involve some frying of onions too. Sometimes potato is even thrown in! |
| Wali | Wali is a starchy food consisting of rice cooked in a combination of coconut milk/oil and water, mixed with salt. It is usually served as an accompaniment to various curries or chicken, fish, and meat dishes. |
| Ndizi-Machalari | Ndizi-Machalari is a dish using bananas and meat as the main ingredients. |

| | |
|--|---|
| Tea/Coffee | These are boiled food consumed with snacks as breakfast and occasionally can be consumed in the afternoon and evening. |
| Ndizi-Matoke | Mattock is spicy soft green banana consumed as mashed or sometimes not mashed mixed with meat and vegetables. Matoke bananas are boiled and accompanied with other meals such as stews, curry, beans, etc . |
| Milk | Boiled milk is consumed as breakfast especially for people who are coming from livestock keeping families. Milk is mostly used for feeding children less than five years of age. |
| Porridge (Uji) | Porridge is a food commonly eaten as a breakfast cereal dish, made by boiling ground starchy grains in water and milk. It is often cooked or served with added flavourings such as sugar, honey, lemon juice, margarine, black pepper to add taste |
| Vegetables (Mchicha, Cabbages, Stew, etc) | These are usually prepared with leafy vegetables such as amaranth cabbages, or spinach with added grated coconut, coconut milk, peanut butter, tomatoes, and onions. It is recommended to serve with rice, Ugali and beans on the side in order to make a satisfying main course. |
| Meat (Nyama, Kiti Moto, Fish, Chicken,etc) | meat/fish/veg stew –many people will pre-cook (boil) meat in bulk and wet fry portions throughout the week. Chicken/fish/veg generally cooked for a lot less time than meat, but difficult to separate out without going through the quantity field one by one. |
| Mayai (Eggs) | Could be boiled, fried or omelette. If omelette, can often be combined with potatoes (chips mayai), which may need deep frying first. |
| Chapati | Chapati is food which can be eaten for breakfast, for lunch or supper. Chapati is made of whole wheat flour salt and water mixed into dough and then flattened. |
| Dessert | Banana like food deep fried when ripe or unripe and eaten with tea, milk, coffee, cocoa,etc |
| Tuber and Roots | These are sweet/irish potatoes, |

The foods which are cooked in Dodoma and Kilimanjaro respectively, most of them are ones require boiling and frying and others are prepared by vendors and bought for consumption in households. For Kilimanjaro, some of these foods are ones that use bicarbonate soda such as ngararimu, Kiburu, Ikatwe, Beans, etc. Bicarbonate soda is added to the food in order speed up cooking of hard foods and increase flavour and tastes of foods.

Table 2: Type of Foods Cooked and Consumed in Two Project Regions, Respectively

| Dodoma | | Kilimanjaro | |
|-----------|--|-------------|--|
| Foods | Description | Foods | Description |
| Soup | These are light and simple white soup from boil meat bones in water, mostly used as breakfast. It can also used as drink in afternoon and evening. Soup can be boiled from different types of meat such as beef, chicken, pork, etc. | Mtori | These are light and simple soup from boil meat bones in water mixed with mashed banana, mostly used as breakfast. It can also used as drink in afternoon and evening. Soup can be boiled from different types of meat such as beef, pork, goat, etc. |
| Mchemusho | Mchemsho is a tasty dish in the form of soup consisting of numerous ingredients such as potatoes, green beans, carrots, bananas, tomatoes, cabbage, | Mangolo | Mangolo are mashed dry banana cooked by mixing with boiled beans |

| | | | |
|-----------------|---|---------------|--|
| | eggplant, sweet peppers, and a variety of spices. | | |
| Chipsi | Chipsi (French Fries) is a staple street food made of sliced Irish potatoes fried in combination with eggs. It is typically served with kachumbari sauce on the side, consisting of tomatoes, chilli peppers, and onions. | Ngararimu | Ngararimu is maize grains which are not peeled cooked with beans. Bicarbonate soda is added during cooking to accelerate cooking process and peeling the outer coat of maize grain, |
| Vitumbua | Vitumbua is a Tanzanian dish, made by mixing rice flour, sugar, yeast and cardamom overnight and frayed in the next morning. These are foods used as snacks for breakfast | Kisusio | These are light and simple white soup from boil meat bones in water mixed with animal blood. It can also used as drink in afternoon and evening. Kisusio can be boiled from different types of meat such as beef, goats, sheep, etc. |
| Maandazi | These are dough shaped into triangles, circles, or ovals, made with sugar, wheat flour, water, yeast, additionally enriched with ingredients such as ground peanuts or almonds. Maandazi are usually served for breakfast with tea. | Kitawa | Kitawa is mashed banana mixed with milk eaten in the afternoon for quenching thirsty |
| Roasted Pock | Food prepared by households and vendors eaten with starchy foods such as Ugali, Rice, Banana, Chips, etc | Kiburu/Ikatwe | Kiburu is soup/stiff of boiled beans or kunde mixed with banana stirred with wooden traditional blander. Bicarbonate soda is added during cooking to accelerate cooking process |
| Roasted Chicken | Roasting of chicken is done by vendors and consumed at selling points or at households | Kichanganya | Kichanganya is dish made as mixture of bananas and beans as the main ingredients. |

Taste of food depends on the cooking styles, contents of recipes and utensils used for cooking. The food cooked in pottery pots are believed to have good taste in Kilimanjaro. Procedures in mixing contents of recipes also have influence to the taste of food cooked. Banana foods are difficult to cook and get taste required because cook must balance heat of the cooker or appliance and specific amount of water is required during cooking. Foods which require special treatment and controlling heat in Dodoma are rice foods such as normal rice and pilau. These types of foods require putting charcoal on top of the lid to dry it and form the crust. Therefore, **the taste of food in Kilimanjaro and Dodoma depends on the way food is cooked, recipe contents, utensils used and heat control.**

According to the evidence from participants, some foods cooked by EPCs were delicious and their taste has increased. These are some foods which used to be cooked by woodfuels and at the end stages charcoal is put on top of it. These foods are rice and pilau. However, use of EPCs has made some participants missing crust for rice and ugali.

5.3 Fuels and Costs

The main fuels used for cooking are biomass energy fuels. Charcoal is used by a large number of households in Dodoma while firewood is the main cooking fuel used by households in Kilimanjaro. Other fuels used in Dodoma are LPG and firewood and in Kilimanjaro are LPG, charcoal, maize cobs and sawmill wastes. Firewood was purchased at a retail price of around TZS 3,000 per bundle which can cook for single day. Some of firewood in Kilimanjaro are collected from household farms while in Dodoma are fetched from nearby woodlands at periphery of the city.

Charcoal was expensive in both Dodoma and Kilimanjaro Region. A charcoal bag was sold at a price of TZS 60,000 in Dodoma and TZS 65,000 in Kilimanjaro, which can be used for one month by household. The average LPG price is TZS 25,000 for a cylinder of 6 kilograms and TZS 55,000 for a cylinder of 15 kilograms.

Despite the high prices of LPG, it is used to cook light foods which means cannot be used to cook heavy foods like Makande, Beans, Kichanganya, etc. This suggests that necessity of introducing the EPCs to lower the time of boiling and cooking those foods.

5.4 Cooking With Electricity

Most of participants in Dodoma and Kilimanjaro declared that they tried to use electricity by using hotplate but they were expensive and sometimes not safe. Some of them received electric hot plate cooker from their children, but they decided to put them in their stores due to the expensiveness of electricity. All households are connected to the grid electricity, but electricity is only used for lighting, charging phones, TV, radio, fridge and ironing. Most of participants believed that it is possible to cook by electricity after witnessing use of EPCs and reading units (kWh) used during cooking of different foods. Otherwise many of them declared that it would be difficult to convince them that it is possible to use electricity.

Cooking with the EPC has influence behavioural change of people in the kitchen and households. A person who have been using firewood or charcoal and LPG stoves and switched to electric pressure cooker showed the changes in the cooking behaviours such as preparation of all recipes and cook later because of the fastness of cooking with EPCs, cooking while doing other activities since it does not burn food and stop refrigeration of half cooked foods because EPC has reduced time of cooking.

5.5 What and how would you prefer to cooking in the future?

The participants from Kilimanjaro and some in Dodoma accepted that they prefer to cook all foods found in their areas which can be cooked in the EPC. Participants added that it is not possible to use electricity every day due to some foods which do not allow using EPCs and fuel stacking caused by power cuts or blackouts.

The issue of clean cooking was also considered by most of the participants. Cleanness is not only for in-door air quality but also for their kitchen, cloths during cooking and smoke soot in their kitchen, etc. For example, participants in Machame, Hai District would like to stop indoor air pollution preferably using clean cooking appliances.

The frequencies of cooking foods like makande, beans, rice, kichanganya and pilau has increased in households because of easiness and fastness of cooking when using EPCs. The positive impacts of affordable cooking with electricity would yield; all areas (Dodoma and Kilimanjaro) observed that they would save time and maintain a clean house or environment.

Some of the participants have realized a lot of benefits after I have received and practiced cooking with the Electric Pressure Cooker (EPC). One participant (Mama Nancy Kidin) said that what I like most from this appliance is taste of food. Food cooked in the EPC is more delicious than that is cooked by other stoves. The EPC also filters fats, when meat is boiled with it. Other benefits include time and energy saving, no smoke, no soot in the kitchen, safety, it does not burn food and it allows me to work on other household chores while cooking. The monthly household cooking budget has just gone down to around TZS 20,000 to TZS 25,000.

5.6 What prevents people from using this ideal fuel/device?

All households selected for the FGDs in Dodoma and Hai District in Kilimanjaro Region are connected to the grid electricity. The possibility of using electricity for cooking for these households was high in all these two areas. The only factors which will prevent them from using EPCs and electricity is power blackouts and cooking foods which cannot be cooked in EPCs. The foods which cannot be cooked in an EPC in rural areas of Hai District in the Kilimanjaro Region are those that require frying and using bicarbonate soda. These foods include chapati, banana chips, dessert chips, frying eggs, pancakes, potato chips, sausages, ngararimu, ikatwe, ndala, kiburu and mangolo.

Space heating is not an issue for Dodoma but for rural areas of Hai district (especially in the coffee-banana zone) is important issue. Traditional three stone fireplaces in households save an issue of space heating in Kilimanjaro Region during cool season. The fireplace also provides services of drying crops placed on the attic of house roofs.

5.7 Willingness to pay

There are two costs considered by participants in two areas are related to payment of EPC itself and electricity. All of the participants accepted that EPC is a good appliance that every household with electricity would like to possess and adopt. The only factor which will reduce their willingness to pay is high price of EPC. However, if the appropriate arrangement will be put in place for credit services, most of the households will adopt the EPCs in both Hai District and Dodoma City.

Most of the participants declared that the EPC is the least cost option available in their areas for cooking. All other fuels and stoves are very expensive than use of electricity in EPCs. All of them accepted that the willingness to pay for electricity for cooking has gone up and they will pass this message to other people in the community.

5.8 Gender roles in the future

The participants in the FGDs in Hai District, Kilimanjaro declared that possibility of cooking has increased to their family members and men and boys might cook more if they use electricity. Women in Hai district are engaged in the economic activities. They will get more time to work in their projects and improve further their livelihood, most are businesswomen, women groups and VICOBAAs. However, some participants said that it is time to get rid of house helpers because the EPC will lessen time and hard work of staying in the kitchen. There is no need to have labourers and will save money they were paying to them for other family services. Some of the participants started to call the EPC- the house girl.

5.9 What are the desirable features of an ideal cooking appliance?

The Dodoma FGDs suggested:

- Availability of EPCs through different dealers
- Affordability EPCs by poor families
- Frying and roasting some foodstuff,
- Access to two or more pots (to avoid aroma from other foods),
- Access to power banks for cooking even with EPC during power cuts,
- Large scale EPCs for commercial and institutional purposes

The Kilimanjaro FGDs suggested:

- Access to two pots (one pot should be non-sticky and another pot sticky)
- Ability to use EPC for frying
- Multitasking – ability of cook to leave food to cook and work on something else
- Importance of safety – focus on awareness and training on usage.
- Size – market should have different sizes of EPCs
- Suitable mode of acquisition – cash or credit services
- Skills for operation, repair and maintenance
- Availability of spare parts
- Access to EPC retailers

6. CONCLUSION

The FGDs have confirmed that there is a strong market for EPC in Dodoma and Kilimanjaro, Tanzania. The convenience of being able to turn on EPC and control the heat output at the action of moving the rotary button was highly valued by the majority of participants. The evidence from these discussions indicates that LPG is currently the fuel which has been accepted by most households in Tanzania, but cooking with electricity, the way it is, has been an attractive proposition, especially since automated energy-efficient appliances such as the EPC can make cooking much easier. It confirms that affordability (or perception of affordability), previous perceptions about cooking with electricity and awareness are the main barriers holding back wider adoption of electric cooking. The future design of MECS interventions must address all those factors and concerns if electricity will be promoted for cooking in Tanzania.

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8. ANNEXES

Annex 1: Tools for the Second Focus Group Discussion (with gender perspectives)

Your experience of cooking with electricity

How did EPC suit the way you cook in your home?

(score:1 = strongly disagree; 2 = disagree; 3 = no opinion; 4 = agree; 5 = strongly agree)

| QUESTION | Electric pressure cooker | | | | | Comment |
|--|--------------------------|---|---|---|---|---------|
| | 1 | 2 | 3 | 4 | 5 | |
| It was easy to control heat | | | | | | |
| EPC could cook fast enough | | | | | | |
| Long cooking dishes were cooked much faster | | | | | | |
| EPC was hot enough | | | | | | |
| EPC burnt the food | | | | | | |
| My pots didn't fit on the EPC | | | | | | |
| Rice/ugali cooked on EPC just didn't taste the same | | | | | | |
| Food cooked using the EPC tasted better than usual | | | | | | |
| I missed the Smokey flavor of food | | | | | | |
| Pots were unstable on electric stoves | | | | | | |
| The EPC didn't make the pots dirty | | | | | | |
| The EPC looked good in my kitchen | | | | | | |
| There is nowhere to put the EPC | | | | | | |
| Operating the EPC was easy | | | | | | |
| EPC was safe to use | | | | | | |
| I prefer to use an electric kettle for water boiling | | | | | | |

How many hobs (rings) or separate appliances do you need for cooking?

[] 1 [] 2 [] 3 [] 4

What were the best things about cooking with electricity?

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And what were the worst things about cooking with electricity?

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What do you like most about cooking with charcoal/ firewood?

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What do you like most about cooking with LPG/kerosene?

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What are the best things about not cooking with charcoal/ firewood?

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What are the best things about not cooking with LPG/kerosene?

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Did you change your cooking behaviour? If yes, how and why?

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Do you think electric cooking is affordable?

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Do you think cooking with electricity is cheaper or more expensive than cooking with the fuels you normally use?

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Were there times when the electricity was off and you wanted to cook or heat water? If so, what did you do?

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Do you feel that cooking with the electric cooker is safer or more dangerous than cooking with your normal stove, and why? (e.g. risk of fires, burns)

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How easy is it to learn to cook on an electric stove?

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Would people need training on how to use an EPC, or would they be able to learn by themselves?

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Would you ever cook using only electricity and no other fuels - and explain why?

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What would you change about the design of the electric stoves you have been using?

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We are done with our survey and are leaving the cookers with you. Will you continue using EPC or will you switch back to your old stove?

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We are not going to ask you to pay for the EPCs. Would you buy this cooker if you saw one in a shop now? If so, how much would you be prepared to pay for this cooker (TZS)?

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Missing data

We have tried our best to learn as much as we can about how you cook, but we appreciate that the tools we are using are limited. Please help us to understand what we may have missed.

Are there any meals that were cooked or water that was heated in your household since the beginning of the study that were not recorded on the forms you have given to us?

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Is there anything else that you think is important about the way you cook that we have not yet captured?

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