JRIIE Journal of Research Innovation and Implications in Education
Center for Research Implications & Practice

Website: www.jriiejournal.com ISSN 2520-7504 (Online) Vol.5, Iss.4, 2021 (pp. 131 – 141)

Management of Improved Cook Stoves Projects for Quality of Life in Teso South Sub-County, Busia County, Kenya

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Abstract: *Kenya has been using improved cook stoves (ICS) since the 1980s because of the significant positive health, environmental, economic and social impacts on improving the quality of life. The main objective of this study was to examine how management of improved cook stoves projects could lead to quality of life in Teso-South Sub-County, Busia County in Kenya. It was guided by Human relations theory of management which underlines the art of getting things done through people working together as a unit. This was a descriptive study that employed both qualitative and quantitative research methods. The study sampled 392 respondents and used questionnaire and interview schedules to collect data. The semi-structured one-to-one interviews were used to collect qualitative data each lasted for 30-45 minutes with 10 interviewees and 2 Key Informants. Quantitative data were analysed using descriptive statistics using Statistical Package for Social Sciences (SPSS version 23), while qualitative data used content and thematic analysis. The study showed that structure, planning, organising, coordination and controlling of resources was important in ICS projects as illustrated by Fayol in administrative theory of management. The study showed that management of ICS projects positively affected health, environment, education and economic security. The study recommended for improved policy framework at the level of the County government to help in the promotion and coordination of ICS programmes and increased adoption rates for quality of life in Teso South Sub-County in Busia, Kenya.*

Keywords: *Management, Improved, cook stoves, Quality, Life*

How to cite this work (APA):

Emukule, P. O., Norvy, P. & Muhingi, W. N. (2021). Management of Improved Cook Stoves Projects for Quality of Life in Teso South Sub-County, Busia County, Kenya. *Journal of Research Innovation and Implications in Education, 5*(4), 131 – 141.

1. Introduction

Traditional Cook Stove (TCS) is a 3-stone stove that uses more biomass in cooking due inefficient technology. Due to its inefficiency a lot of firewood is used and a lot of smoke is produced which is harmful for health and environment. The use of traditional cook stoves has led to increased rates of forest degradation especially in rural areas. For example in Malawi 84% of the 2.3 million households are in the rural areas and biomass supply is estimated at 99% of the energy used (Chagunda, Kamunda, Mlatho, Mikeka & Palamuleni, 2017).

As a result of the traditional cook stoves being a danger to human health and the environment, researchers had to hit the ground looking for solutions to the problem. Research for improved technology and efficient energy use is on-going and has resulted in different types of improved cook stoves (ICS) especially in the rural areas where the majority of the population depends on traditional biomass

(wood, charcoal, dung etc.). The improved cook stoves halves the biomass used on the traditional cook stoves due to its efficiency and reduces significant health and environmental problems (Chagunda et. al, 2017).

About 3 million people, that is, 40% of the population of the world use biomass cook stoves inefficiently, hence being exposed to indoor air pollution (World Bank, 2018). Women and children are the most affected in the households. An estimated 3.7 million people die prematurely every year due to indoor air pollution caused by smoke from traditional biomass cook stoves. This makes the indoor air pollution the leading cause of disease second to smoking (Smith et al., 2014).

Most of the developing countries lack access to modern, affordable and sustainable clean energy for social and economic development (Smith, 1993). About one million Honduran households use traditional wood burning stoves (Flores, Ojeda, Flores & Rivas, 2011). These stoves are not only inefficient but destructive to human health, economy and the environment. According to Nahar (2016), an estimated 2 million more women and children die annually in developing countries because of indoor pollution, as they are exposed to carbon monoxide and the volatiles in the form of smoke.

In the rural areas of Sub-Saharan Africa, biomass is not only cheap or easily available but is the only option available. More than 69% of the population use biomass as the most reliable source of fuel for cooking (Sawin, 2017). The increased use of biomass especially by inefficient technologies has raised concerns on the rate of deforestation and loss of biodiversity (ESMAP, 2011). Globally, Sub-Saharan African has the highest dependency on solid fuels at 82%, Asia is about 71%, Eastern Europe is 19% and Latin America is about 17% (World Bank, 2015 on The State of the Global Clean and Improved Cooking Sector).

In Rwanda, biomass accounts for 85% of primary energy consumed of which wood contributes 57%, Charcoal 23%, crop residues and peat 5%. Non-biomass contributes 14% of which petroleum products account for 11% and electricity accounts for about 4% (Uwisengeyimana et al., 2017). In Tanzania biomass continues to be the main source of energy accounting for 85.5%, petroleum accounts for 6.6%, gas accounts for 1.5%, hydroelectricity at 0.6% while coal and peat account for 0.2% (Energy Agency Statistics for Tanzania, 2012).

In Uganda the main source of energy is wood used by the poor for cooking accounting for 90% of the energy mix (Lee, 2013). Indoor air pollution was found as the highest contributor to the negative health effects. The pace to adopt efficient cooking stoves i.e. ICS was very slow in spite of the policies and infrastructure being in place. The majority (85%) of the population lives in rural areas of which about 1% of the households are connected to the national grid (UNEP on Uganda Air Quality Policies, 2015).

In Kenya, most rural homes and peri-urban settlements use traditional biomass (wood, charcoal), dung and residues from agricultural plants are commonly used for cooking using the traditional cook stoves. Biomass accounts for about 90% of energy used in rural households. The country's poor remain vulnerable to respiratory diseases due to poor air quality (United Nations Development Programme, Nationally Appropriate Mitigation Action, 2016).

The world population will continue to grow every year hence more demand for energy i.e. biomass and the developing countries are even growing faster from an estimated 7.7 billion by mid-2019 to 8.5 billion in 2030, 9.7 billion in 2050 and 10.9 billion in 2100. Sub-Saharan Africa could account for half of the growth of the world's population (one billion) between 2019 and 2050 (United Nations World Population Prospects, 2019). Therefore, there is an urgent need for efficient energy technology i.e. ICS.

It is therefore, imperative to develop more efficient and safe charcoal/wood burning stove with less fuel consumption rates as well as minimal indoor air pollution; the improved cook stoves (ICS). With the adoption of the improved cook stoves, less time is spent in cooking, collecting fuel, less biomass fuel is used in cooking, less pollution and exposure to disease, more savings, asset growth and more time for rewarding and productive activities (Barnes & Samad, 2018).

Improved cook stoves play an important role in combating global warming and climate change by reducing greenhouse gas emissions. Globally, cooking accounts for about 2% of all greenhouse gas (Grupp, 2004). According to a study carried out in 2015, the emissions from wood fuel account for 1.9%-2.3% of global CO2 emissions (Bailis et al., 2015). The use of ICS will therefore, significantly reduce health diseases, saving the economy and the environment.

Improved cook stoves (ICS), have a consumption rate of 71.2% less firewood than the traditional cook stoves (Flores et al., 2011). The use of ICS reduces cost and time for collecting firewood, reduction in health expenses (Wilfredo, 2016). The use of biomass as a source of energy for cooking will not end any time soon with the rural population in the developing economies especially the Sub-Saharan Africa. The use of ICS is critical in reducing the effect of inefficient biomass cook stoves to the environment and human health. According to the study carried out in Burkina Faso, improved cook stoves accounted for improved health, reduced cooking time and the consumption of firewood by 28% (Bensch, Grimm & Peters, 2015).

According to a research carried out by the UNFCCC in 2016 in four counties of Nyeri, Kitui, Machakos and Laikipia in Kenya, the project was the construction of efficient cook stoves to replace inefficient 3-stone fire in rural communities in the respective counties. The aim of the project was to measure the results in saving of unsustainably harvested firewood hence reduction in Greenhouse Gas (GHG) emissions from thermal energy consumption. The project aimed at installing 41,100 efficient cook stoves and reduce Greenhouse emission from 301,724t CO2 to 43,103t CO2 in a period of seven years (UNFCCC, 2016).

The research further highlights that in Kenya's rural areas, fuel wood covers 80% of cooking needs (National Environment Action Plan, 2013). In Kitui 90% of the rural population use firewood for cooking purposes and only 3.8% households are connected to the electricity (Kitui District Environmental Action Plan, 2013). The high consumption of wood fuel was due to 3-stone open fire traditional way of cooking.

A majority of the Kenyan rural households use traditional 3-stone cook stoves for cooking. According to GiZ report of 2006, 87.5% of the population still uses traditional 3-stone for cooking (Igwe, 2007) and the penetration of ICS in Kenya is estimated at 5% (Muchiri, 2008).

It is important that, as we respond to the demands in energy we should focus on management of improved cook stoves projects for quality of life to ensuring healthy lives and promote well-being for all at all ages, ensuring inclusive and equitable quality education and promote lifelong learning opportunities for all, taking urgent action to combat climate change and its impacts and protecting, restoring and promoting sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halting and reversing land degradation and halting biodiversity loss.

The term quality of life has had varied definitions from various authors. According to Keith (2001), quality of life is a systematic framework aimed at improving the lives of individuals. It is multidimensional as well as valued based and dynamic. It comprises subjective and/or objective indicators. It is most reliably measured by subjective indicators by persons capable of self-evaluation. The WHO defines quality of life (QOL) as an individual purpose-aligned cultural and value system by which a person lives, relative to their aims, hopes, living standards and interests. This is a detailed concept which incorporates individuals' physical and psychological health, their degree of independence, their social liaisons and how they relate to their surroundings (The WHOQOL Group, 1995).

Energy plays a vital part in a country's socioeconomic growth since it helps to raise the standard of living and quality of life. As a result, a country's economic development can be gauged in part by looking at its energy consumption patterns (Jan, Ullah, Akram, Khan, Asim, Mahmood,.. & Ahmad, 2017 citing Mirza, Ahmad & Majeed, 2008). Improved cook stoves (ICS) have the potential to provide "triple wins" by benefiting home health, local ecosystems, and global climate. However, their potential is hampered by low and slow spread, owing to cultural, geographic, and institutional barriers, as well as a lack of markets. Widespread distribution, as well as evidence of their usefulness, has proven difficult (Pattanayak, Jeuland, Lewis, Usmani, Brooks, Bhojvaid,.. & Ramanathan, 2019 citing Jeuland, Bhojvaid, Kar, Lewis, Patange, Pattanayak, ... & Ramanathan, 2015).

Access to clean cooking, heating, and lighting facilitates progress on the broader sustainable development agenda. Closing the energy access gap is now a top priority on the international agenda for sustainable development. Accelerating access to clean energy represents a huge opportunity to make progress on several SDGs, as well as to take advantage of the synergies currently offered by initiatives spanning energy, gender, health, and climate change, such as SE4All, the Global Alliance for Clean Cook Stoves (GACC), and the Climate and Clean Air Coalition (CCAC) (World Health Organization (WHO) (WHO,2016).

Concerns about the role of traditional cooking technologies in global climate change have fueled a current campaign for wider adoption of ICS in developing nations. The second largest contributor to global warming is black carbon emissions from the usage of conventional wood cook stoves and diesel engines (Ramanathan & Carmichael, 2008). Currently, more than 160 ICS programs are operating worldwide (Ruiz-Mercado, Masera, Zamora & Smith, 2011). Large subsidies can limit households' motivation to use, maintain, and eventually buy improved cook stoves, according to a recent analysis of the enablers and obstacles to the uptake of improved cook stoves across Asia, Africa, and Latin America. Management of improved cook stoves projects plays a central role in building of quality life as well, hence the need for this study. Drawing on these insights, we examine the extent to which management of improved cook stoves projects enhances quality of life in Teso South sub-county in Busia County in Kenya.

2. Literature Review

According to Palit and Bhattacharyya (2014), there are six factors that slow the rate of ICS adoption in Asia and Sub-Saharan Africa; overemphasis on technology and under emphasis on user-friendliness-that is technology centred focussing on good design from the perspective of designer and little consideration from the user. Change of lifestyle to use improved cook stoves, purchasing patterns by households, limited income and financing sources, limited market players and stove builders in the rural areas, and knowledge gap-more information and data needed to

strengthen evidence based action and policy to change the trend.

In Nepal, 90% of the total energy comes from biomass and nearly two thirds is used for cooking using Traditional Cook Stoves. This prompted the introduction of programmes to promote ICS which resulted in the installation of over 700,000 ICS in rural households across the country. However, household needs i.e. the family size and cultural practices were ignored hence slowing the rate of ICS users (Thapa & Subba, 2015).

Africa Clean Cooking Energy Solutions Initiative (ACCES) 2014 report, clearly underlines that Sub-Saharan Africa has significantly lower rate of access to clean and improved cooking solutions than any other region in the world. This is due to; limited consumer exposure to new technologies and low awareness of their benefits hence limited demand, the inability of new technologies to fit with the cooking preferences of the consumers, consumers lacking trust in the performance and durability, concern on after sale support services and cultural obstacles (ACCES, 2014).

In Ethiopia, a study was carried out that concluded that the determinants for ICS adoption were stove design and neighbourhood effect, therefore, no design was fit for all and hence to increase the adoption rate, the design should take into consideration socio-cultural feeding practice of the user (Bahta & Berhe, 2020).

In Uganda, the low adoption rates of ICS is due to; unwillingness of consumers to pay market prices for ICS-this is because of the past projects that were sizeably subsidised, lack of awareness on the effect of indoor air pollution and global warming, and women's limited intra-household bargaining power (Theresa, David & Garrick, 2014).

ICS have high efficiency, low emissions, reduced time, money and labour one requires to acquire fuel. It also reduces the anthropogenic climate change, deforestation and improved health by reduced exposure to household air pollution. As 40% (2.8 billion people) continue to cook on inefficient traditional cook stoves hence being the 4th most significant risk factor for premature deaths worldwide, and second in South Asia and Sub-Saharan Africa (Shankar, Johnson, Kay, Pannu, Beltramo, Derby, Harrell, Davis & Petach, 2014).

It is therefore, fundamental that as we respond to the demands in energy we should focus on management of Improved Cook Stoves projects for quality of life as underlined by Sustainable Development Goal (SDG) 3, 4 and 15 demands for; good life and well-being, quality education and life on land respectively.

According to a study undertaken by Global Village Energy Partnership International in 2012, the number of Kenyan households using improved cook stoves was 2.5-3 million (Global Village Energy Partnership International, 2012). In Kenya, about 86% of the population rely predominantly on traditional sources of cooking energy such fuelwood, charcoal and agricultural residues, only 26% use Improved Cook Stoves. The slow adoption rate for ICS has been due to; lack of financing, slow technological progress, low consumer awareness and lack of infrastructure for fuel and stove production and distribution (Karanja & Gasparatos, 2020).

Planning of resources is a process of defining how to estimate, acquire, manage and utilise human and resources efficiently (Project Management Body of Knowledge, 2017). This is important because each project is managed according to its complexity and needs. It also important because enough resources are availed for the project needs. Resources are human (manager, community members, sponsors, team members, etc.) and nonhuman (supplies, services, materials etc.). Other projects may also be competing for the same resources needed in the project; this significantly impacts the project in terms of cost, time, schedules and quality (Project Management Body of Knowledge, 2017). Planning is a systematic process of making decisions on goals and activities to be perused by the organisation. Planning therefore, should begin with a critical analysis of the context be able to provide an organisation with the right direction Planning is one of the core management functions in the organisation (Jeseviciute-Ufartiene, 2014).

Resource planning is a necessary process in a project; however, it does not guarantee the success of the project as lack of it guarantees failure. The main reason why projects fail is because of lack of planning and effective planning should be done at the beginning of the project (Kerzner, 2009). Planning of resource is critical to any project and should be given enough time and energy for the success of the project. Human resources to a project have as significant role as it is through them that a plan is developed, checked, implemented and evaluated. This mean that the project management plan gets its value because of the right resources. Human resource are most valuable resource in the project, however, they could be the most difficult to manage. It is important for the project manager to develop a human resource plan which identifies project roles, responsibilities, required skills and staff management plan (PMBOK, 2017).

Planning of resources is a continuous process to help the project in achieving its objectives as it analyses its strengths, weaknesses, threats and opportunities. It is an important process for the success of the project. Planning of resources in project management is becoming import and complex. This is because the demand for suitable human resource and the scarcity of nonhuman resources which need to be efficiently used. Planning of resources makes sure that the project has access to the necessary resources at the right time (Umulisa, Mbabazize & Shukla,

2015). The objective of management of ICS projects is to have quality of life.

Planning is key in any project especially management of Improved Cook Stoves projects in Teso South Sub-County in Busia County. This is because in planning of resources, tasks are allocated to human and nonhuman resources as to maximise their efficiency. Planning of resources by the project manager helps in resource use and tracking on resource capacity in order to keep the project on time and budget. Planning of resources helps the project in efficiency, maximising its resources, deliver the best result in time, predict and procure the needed resources ahead of time, improve job satisfaction for employees and good relationship with customers (Meier, 2019).

For a project success and to avoid costly and negative impacts on the project, the project manager must use planning tools that help minimise time and cost like the Work Breakdown Structure (WBS). According to Langford and McCann (1983), WBS has been a successful planning tool by the US Department of Defence for decades. The effective use of the WBS as a planning tool helps in identifying tasks and resources needed for the project. The Work Breakdown Structure is a process of breaking the project deliverables and work into smaller units that can easily be managed. The package of work is defined at the lowest level of the WBS hierarchy where cost and duration are defined and managed. The level of division and subdivision is according the control to effectively manage the project (Pountney, 2013).

According to the empirical quantitative research undertaken by Jeseviciute-Ufartiene from Vilnius Gediminas Technical University, Lithuania in 2014 on importance of planning in management developing organisation, M. Seeman methodology was used with 64,437 as population size of business organisations. The sample size was 96 respondents with a degree of confidence at 95% and margin of error at 5%. The results of the research showed that there was identified weak but statistically significant correlation between planning and management and development of an organisation thus a presumption that top managers perceive the meaningfulness of planning process. The research showed that top managers of the Lithuanian business organisation do not relate directly planning with management and development of the organisation. On the other hand, they do not deny the significance of planning and importance of decisions made during planning for the management and development of organisation (Jeseviciute-Ufartiene, 2014).

Teso South Sub-County, Busia County is located in Western part of Kenya and as underlined by Infotrak (2017), 9 out of 10 households use charcoal and wood for cooking using the three stone traditional cook stoves. This has led to a lot of pressure on forests for charcoal and wood as the main source of energy for cooking, a lot of smoke when cooking causing health problems, more expenditure on buying firewood as well as a lot of time for fetching firewood. Hence a great threat to quality of life.

3. Methodology

This study used a descriptive research design that aimed at accurately and systematically describing a population, situation or phenomenon (McCombes, 2019). This design aimed at accurately identifying and obtaining information on characteristics of a particular issue, for example a community, group or people. The research design describes social situations, events, structures etc. The researcher describes what he or she finds and studies the current situation (Akhtar, 2016). Descriptive research design was significant in this study to inform the researcher of the current situation of the phenomena i.e. the target population, education levels, monthly income, family size etc. without changing the state. Descriptive research answers the questions, who, how, when, what and where (Akhtar, 2016).

The population of Teso South Sub-county was 168,116 (KNBS, 2019). In this research to calculate the sample size of the target population of 168,116 we adopted Taro Yamane's formula, $n=N/ [1+N (e)^2]$ (Matula et al., 2018). Where n was the sample size, N was the population size (168,116), 1 was the constant value and e was the level of precision/the margin of error (0.05).

For example: $n=168,116/ [1+168,116 \times 0.05^2]$

$n=168,116/ [1+168,116 \times 0.0025]$

$n=168,116/ [1+420.29]$

$n=168,116/421.29$

$n=399.050$ (approximately 400 respondents). Therefore, a sample size of 400 respondents out of the entire population of 168,116 respondents was the lowest acceptable number at a 95% confidence level with a 5% margin of error.

The survey locations and sampling unit of households selected, as well as interviews, were chosen using both probability and non-probability sampling techniques. The number of respondents for every ward was; Ang'orom (35,229/168,116) x 400 = 84, Chakol South (33,689/168,116) x 400 = 80, Chakol North (27,313/168,116) x 400 = 65, Amukura West (20,267/168,116) x 400 = 48, Amukura East (23,000/168,116) x 400 =55 and Amukura Central (28,618/168,116) x 400 = 68.

Data was collected using questionnaires and interview schedules. Quantitative data was analysed using descriptive statistics while qualitative data was collected using thematic and content analysis. Quantitative and

qualitative data were presented in tables and narratives respectively.

4. Results and Discussion

This section presents and discusses the findings of the study with regard to improving quality of life as a result of using ICS.

Table 1: Planning of resources for Quality of life

SL NO	Enhanced planning of resources (392)	SA		A		NA nor D		D		SD	
		N	%	N	%	N	%	N	%	N	%
1	Planning reduces uncertainty in the project	301	76.8	91	23.2						
2	Planning makes better utilisation of resources	328	83.7	33	8.4	30	7.7	1	.3		
3	Planning chances to achieving objectives	26	6.6	313	79.8	16	4.1	36	9.2	1	3
4	Planning reduces cost of performance	254	64.8	60	15.3	48	12.2	16	4.1	14	3.6
5	Planning helps direct all attention to objectives	101	25.8	139	35.5	113	28.8	22	5.6	17	4.3
6	Project achieved its main objectives	122	31.1	188	48.0	42	10.7	22	5.6	18	4.6
7	Project owns material assets	8	2.0	5	1.3	379	96.7				
8	Project has sources of income	2	.5	23	5.9	258	91.3	9	2.3		

SA=Strongly Agree, **A**=Agree, **NA nor D**=Neither Agree nor Disagree, **D**=Disagree, **SD**=Strongly Disagree. The percentage calculation is based on a sample of 392 respondents.

Planning is an important process in ICS projects. It reduces uncertainty in the project, makes better utilisation of resources, increases chances to achieving objectives, reduces cost of performance, helps direct all attention to objectives and achieved its main objectives. This has been reiterated by Jeseviciute-Ufartiene (2014) that should be able to provide the organisation with right direction. Kerzner (2009) equally underlines that projects fail because of lack of planning and effective planning should be done at the beginning of the project.

Planning reduces uncertainty in the project 76.8% of the respondents strongly agreed while 23.2% agreed. The results indicated that even those respondents who were not beneficiaries of the ICS project either strongly agreed or agreed that planning was important in the project especially ICS project in improving the quality of life. Planning makes better utilisation of resources in the project, 83.7% of the respondents strong agreed, 7.7% neither agreed nor disagreed while 0.3% disagreed. The findings indicated that planning as an important component of the project for better use of the resources especially for ICS projects.

The findings showed that the majority of the respondents (80%) agreed that planning increases the project's position in achieving its objectives. This indicated that for success ICS projects to achieving its objectives planning was fundamental. Planning reduces the cost of planning in a project, 65% of the respondents strongly agreed, 15% agreed, 12% neither agreed nor disagreed while 4% and 3.6% disagreed and strongly disagreed respectively. The findings indicated that planning as an important component of the project as it reduces the cost of the project as resources are well planned and used to achieve the objectives of the project.

Planning helps in directing all attention to the objectives of the project, the respondents had scattered opinions with 25.8% strongly agreeing, 35.5% agreed while 28.8% neither agreed nor disagreed. This data indicates that 61.3% of respondents strongly agreed and agreed that planning in ICS direct all attention to the objectives of the project. The findings showed that 31.1% of the respondents strongly agreed, 48% agreed, 4.6% strongly disagreed, 10.7% neither agreed nor disagreed while 5.6% disagreed. This indicated that the ICS projects achieved its main objective of reducing the use of firewood and increasing the forest cover.

On the question to find out if project owned material assets, the majority of the respondents (96.7%) neither agreed nor disagreed. This indicated that the respondents were not very much interested in knowing what belonged to the project but more interested on how the ICS projects were to transform their lives and livelihoods. Equally, to find out if project had sources of income; the majority of the respondents (91.3%) neither agreed nor disagreed.

This indicated that the respondents were not very interested in knowing the sources of income of the project but more interested on how the ICS projects were to help them to have a sustainable source of income.

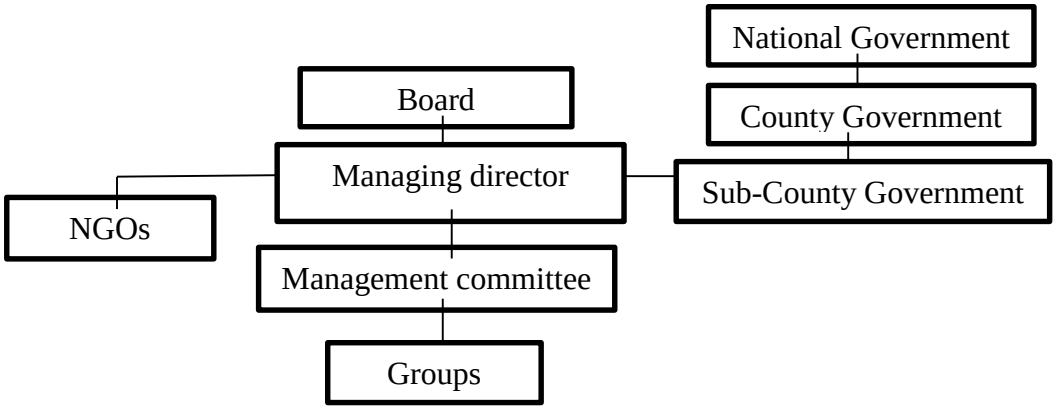
Participants strongly agreed and agreed on the importance of planning for the success of the project, reduction of uncertainties, cost of performance as well as for the proper use of the available resources provided the following narrative: *planning is the heartbeat of any project, when it is not carried out well, time and resources are wasted as the project stalls and dies.* As Umulisa, Mbabazize and Shukla (2015) clearly put it that planning of resources makes sure that the project has access to the necessary resources at the right time. Meier (2019) equally underlines the importance of planning as it helps the project in efficiency, maximising its resources, deliver the best result in time, predict and procure the needed resources ahead of time, improve job satisfaction for employees and good relationship with customers.

Management of ICS projects is a set of functions such as planning, organising, coordinating and controlling of available resources. It is the establishment of vision, goals, communicating and guiding others to achieving these goals. It is equally a group of people responsible for making decisions for example in a given project or organisation i.e. the management team (Lloyd & Aho, 2020).

ICS projects had 10 members of the management committee who planned, organised, coordinated and controlled the activities with 20 groups. The 10 members had each two groups to closely follow their progress, training as well as walking with them in their challenges. The 10 members had monthly meetings with managing director who trained them on how to manage and run groups. The director linked the Community Based Organisation (CBO) to the various levels of the government and donor institutions.

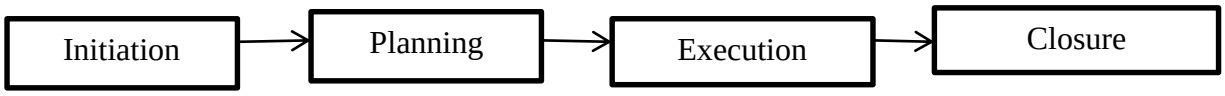
Amukura Orphanage is a registered Community Based Organisation (CBO) founded in Amukura central ward in Teso South Sub-County, Busia County, Kenya since 2010. It is one of the CBOs which implements improved cook stoves (ICS) projects in the local community, Ward, Sub-County and County. Its focus was on efficiency in energy consumption in an attempt to reduce the amount of firewood and charcoal used for cooking, hence improving health, education, economic security and quality of the environment. An estimated total of about 20 ICS were installed every month in households that were initially using 3-stone open fire for cooking. The ICS project technology is mainly made using locally available materials; bricks or mud, sand, cement and water. The construction is done onsite as the stove is fixed and installed in the households.

Organogram of Amukura Orphanage (CBO)



The management of the CBO was crucial in achieving the objectives of the project. The board played the role of an oversite body. The director coordinated different meetings, activities and programmes with the board, NGOs i.e. Green Africa and the Sub-County government. The managing director and the management committee formed the management. They planned for the objectives, needed resources, various responsibilities and dates to complete various tasks in the project. The management organised for resources to make sure that the minimum resources available for the project i.e. funds, materials, humans were put into maximum use to achieve the objectives of the project. Controlling and coordination was another vital role of the management team to make sure that the systems, processes and structures of the organisation are well linked up to each other and had set standards in order to meet the objectives of the project.

The Amukura Orphanage ICS project has four phases of the project



The initiation phase; the stakeholders saw the need i.e. the problem of quality of life manifested in poor education, health, economic security and environment. The brainstorming process then began on how best to solve the problem. The majority of the stakeholders suggested ICS project with the main objective for energy efficiency hence less use of firewood and reduced emission of smoke. Other specific objectives of the ICS projects included; reduced amount of firewood used for cooking, reduced time and labour in looking for firewood, reduced amount of money spent on buying firewood, reduced the rate of deforestation, reduced amount of smoke emissions and sensitised the community on importance of ICS.

When the initiation phase was complete, the planning phase began with the breaking down of the big project into smaller tasks that are easily manageable, built a team, schedules for completion of tasks, smaller goals also were created to making sure that the project time frame and budget are respected. After the planning was done the project was executed, get work done and ICS product in the households. The project manager kept on track the team, quality, timelines, budget and the agreed plan of the project. Once the project attained its objective to have ICS in the households then it was the closing phase.

5. Conclusion and Recommendations

In conclusion, the research found out that management of Improved Cook Stoves projects leads to quality of life (improved health, education, environment and economic security). It was clear from the study that management of ICS projects; planning, organising, coordination and controlling of resources positively impacted on health as the amount of smoke significantly reduced as the improved cook stoves burns firewood efficiently, on the environment as the amount of firewood for cooking equally reduced hence enhanced forest cover, in education, there was a significant growth on the number of persons having tertiary and university level of education and the majority of the respondents were able to earn more than two dollars per day.

This shows how management of ICS projects have been in Teso South Sub-County for 10-15 years has improved health, more people have been able to further their education after secondary school studies (tertiary and university) dues to savings that would have been used to purchase firewood and also due to sales from ICS products. With efficient firewood consumption, the amount of firewood significantly reduces which has a positive impact on the environment as the number of trees cut down for firewood reduced. The ICS project has help cut down the expenditure on firewood and therefore, this money invested to build a resilient economy also the sales from the ICS products have been a reliable income.

This study contributes to the world of knowledge by proposing that management of ICS projects would increase ICS adoption rates leading to quality of life in Teso South Sub-County by adopting a descriptive research design, mixed method research (quantitative and qualitative) and a sample size of 392 respondents. The study also suggested for improved policy framework at the level of the County government to help in the promotion and coordination of the ICS programmes.

The study recommends planning of resources in all projects and at all levels of the project in order to keep the project focused to achieving the set objectives. The County government and the NGO (Green Africa) may have sessions and seminars to offer technical skills to the residents of Teso South Sub-County on how to plan their resources (both human and nonhuman). As planning of resources will enable the residents of Teso South Sub-County to put into maximum use what they have for enhanced quality of life; improved health, education, environment and economic security.

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