RELATIONSHIP BETWEEN COMMUNITY CURRENCIES AND NUTRITIONAL INTAKE OF HOUSEHOLDS IN KIBERA KENYA

BY

SHARLENE MBULA MULE

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I SHARLENE MBULA MULE do declare that this project report is my original work and to the best of my knowledge has not been submitted for a degree in any other institution.

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ABBREVIATIONS AND ACRONYMS

AMREF	African Medical and Research Foundation (currently Amref Health Africa)
CBO	Community Based Organization
CC	Community Currency
CT-OVC	Cash Transfer to Orphans and Vulnerable Children
CU5s	Children Under 5 years
DDS	Dietary Diversity Score
FAO	Food and Agriculture Organization
FFQ	Food Frequency Questionnaire
GEF	Grassroots Economics Foundation
GoK	Government of Kenya
HSNP	Hunger Safety Net Programme
KII	Key Informant Interview
KNBS	Kenya National Bureau of Statistics
Kshs	Kenya Shillings
MSF	Doctors Without Borders
MUAC	Mid Upper Arm Circumference
NFNSP	National Food and Nutrition Security Policy
NGOs	Non-Governmental Organisations
OPCT	Older Person's Cash Transfer
PWSD-CT	Persons With Severe Disability Cash Transfer
UFS-CT	Urban Food Subsidy Cash Transfer
UN	United Nations

DEFINITION OF TERMS

Cash transfer – the provision of assistance in the form of cash to the poor or to those who face a probable risk of falling into poverty in the absence of the transfer. Their main objective is to increase poor and vulnerable households' real income; they can either be conditional or unconditional.

Community – a group of people bounded by geographical links such as a village, settlement or district; or those brought together by a common lifestyle, culture, religion, hobby, interest, concern or goal.

Community currency – a regionally based means of exchange for use at local participating businesses that does not replace, but rather supplements, the national currency system. It is also known as a local currency.

Dietary diversity - relates to nutrient adequacy (coverage of basic needs in terms of macro- and micro-nutrients) and to diet variety or balance, which are two of the main components of diet quality.

Food security – a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.

Food voucher – near-cash paper tokens targeted to poor households which they can use to purchase (specific) food items at authorized retail locations; often based on the gap between the amount of resources spent on food and the amount needed to acquire a minimum food basket. It is also known as food coupon or food stamp.

Malnutrition – a nutritional disorder or condition resulting from insufficient or poorly balanced diet, or from defective digestion or assimilation of foods.

National currency – the legal tender or means of exchange issued by a nation's central bank or monetary authority; which is usually the predominant currency used for most financial transactions in that country.

Nutrition – the science of foods, their nutrients and other substances they contain; their actions within the body (including ingestion, digestion, absorption, transport, metabolism and excretion) and food-related behaviors.

Nutrition security – a situation that exists when food security is combined with education, a sanitary environment, adequate health services and proper care and feeding practices to ensure a healthy life for all household members.

Nutritional status – the physiological state of an individual that results from the relationship between nutrient intake and from the body's nutrient demands, ability to digest, absorb and utilize these nutrients.

Overweight – a condition of having a weight that is 'too high' in relation to a person's height. In adults it means having a Body Mass Index (BMI) of 25-29.9.

Price subsidy – a benefit given by the government to groups or individuals usually in the form of a cash payment, tax or price reduction; so as to remove some type of burden and is often considered to be in the interest of the public.

Social safety net – a non-contributory transfer programme seeking to prevent the poor or those vulnerable to shocks and poverty from falling below a certain poverty level; can be provided by the public or private sector. It is also known as a **social protection system**.

Stunting – shortness due to a deficit in growth in height that has failed to reach genetic potential. Low height-for-age and defined as <-2 standard deviations (SD) of the height-for-age median value of a reference healthy population.

Supplementary feeding programme – a programme that provide a direct transfer of food, free of charge or at a low cost, to vulnerable groups of a population so as to cover deficiencies in their normal diet.

Undernourishment – when a person is not able to acquire enough food to meet the daily minimum dietary energy requirements, over a period of one year.

Underweight – low weight-for-age; a composite of stunting and wasting. Defined as <-2 standard deviations (SD) of the weight-for-age median value of a reference healthy population.

Wasting – low weight-for-height. It is a condition that results from the loss of both tissue and fat in a body that usually reflects severely inadequate food intake or infectious processes happening at present. Defined as <-2 standard deviations (SD) of the weight-for-height median value of a reference healthy population.

1.0. INTRODUCTION

1.1. BACKGROUND INFORMATION

About 793 million people globally, 220 million people in Sub-Saharan Africa, 68.7 million people in East Africa and 9.9 million people in Kenya are undernourished. There has been an overall decline in these numbers over the past decade, despite significant population growth. However, in recent years progress has been hindered by slower and less inclusive economic growth as well as political instability in some developing regions. Economic growth is a key success factor for reducing undernourishment, but it has to be inclusive and provide opportunities for improving the livelihoods of the poor. For that reason enhancing the productivity and incomes of low-income households is essential for progress. (FAO, 2015)

Social protection systems have been critical in fostering progress towards the goals against hunger and poverty in a number of developing countries. Social protection directly contributes to the reduction of poverty, hunger and malnutrition by promoting income security, access to better nutrition, health care, education and moderating the impacts of shocks. (FAO, 2015) There are various approaches of offering social protection, they include: cash transfers, price subsidies, supplementary feeding programmes, food vouchers and community currencies. In Kenya, the public sector has invested in social protection systems mainly by implementing cash transfers and supplementary feeding programmes; while the private sector implements cash transfers, food vouchers and supplementary feeding programmes. The public sector is strongly focused on intervening against malnutrition and hunger in the rural households, leaving the urban households neglected.

In 2010, Grassroots Economics Foundation (GEF, 2015) a non-profit foundation, implemented community currency (CC) programmes in 5 locations in Nairobi and Mombasa. It has helped more than 700 small businesses and 20 schools take an active role in their own economy and development. These community currency programmes include: Kangemi-Pesa, Gatina-Pesa (Kawangware), Lindi-Pesa (Kibera), Ng'ombeni-Pesa (Mombasa) and Bangla-Pesa (Mombasa).

Local goods and service providers are brought together into a business network and legally registered as a Community-Based Organisation (CBO). Each business member is guaranteed by other members for an initial amount of credit, which is currently printed as vouchers for goods and services usable at any business in the network, thus acting as a community currency (CC). Businesses owners within the network trade both in

Kenya Shillings and, to an agreed percentage, the CC. A percentage of these credits are collected by local networks as a tax and used for social service work – like employing local youth for waste collection and road maintenance. The credits rotate around the community helping to connect excess supply and demand for people who lack access to shillings. (GEF, 2015)

Despite its achievements, the CC programme encountered legal obstacles after the launch of the Bangla-Pesa model, as Kenyan authorities initially claimed that the programme was illegal. After court battles the programme was deemed legal and with the cooperation of local ministers as well as police, the Bangla-Pesa program was re-opened. (GEF, 2015)

With CC's, schools, the self-employed and informal sector businesses form a network which creates a credit backed directly by the goods and services of the businesses. This creates a form of interest-free credit that the community members can use when the national currency is scarce. Membership fees for being a CC holder are charged in the national currency and are then used for community development programmes. (GEF, 2015)

1.2. STATEMENT OF THE PROBLEM

Community currencies offer a sustainable platform for poverty eradication by increasing trade and boosting the economy of a community. However, there is a diminutive pool of knowledge on how the existing CC programme in Kenya relates to the nutritional intake of its beneficiaries, especially because the CC facilitates the purchase of food and non-food items.

1.3. JUSTIFICATION OF THE STUDY

Community currencies (CC's) are a sustainable socio-economic development tool as they provide communities with access to interest-free credit. They enable communities to finance social services such as education, environmental and health services, thus increasing local trade, employment, small business development and overall local economic stability. CC's give communities a way to create their own mutual-credit-clearing or barter exchange system to build economic resilience and to self-fund community development programmes. This tool has already been implemented and is currently on-going in Kenyan urban informal settlements and has so far proved to be successful in facilitating socio-economic

development. It is therefore an effective and sustainable development tool as it does not need donor inputs in the long run.

1.4. AIM OF THE STUDY

To establish the link between community currencies and the food and nutrition security in urban informal settlements.

1.5. PURPOSE OF THE STUDY

To generate empirical knowledge on the role of community currencies in the nutritional intake of inhabitants of an urban informal settlement.

1.6. RESEARCH OBJECTIVES

1.6.1. General objective

To assess the relationship between community currencies and the nutritional intake of households with vulnerable groups in Lindi village, Kibera informal settlement.

1.6.2. Specific objectives

i. To determine the daily average intake of nutrients among community currency users and non-users in Lindi households.
ii. To assess the consumption frequency of high-fiber starches, highly bio-available proteins, fortified foods and prestigious foods by community currency users and non-users in Kibera.
iii. To assess and compare the dietary diversity of community currency users and non-users in Kibera.
iv. To determine what proportion of community currency is used in the purchase of food items.

1.6.3. Study hypotheses

i. There is an association between food frequency and community currency.
ii. There is no association between dietary diversity and community currency.

2.0. LITERATURE REVIEW

2.1. INTRODUCTION

Malnutrition is the state of being either over-nourished or undernourished and is assessed using various measures such as anthropometric, biochemical, clinical and dietary measures. Over-nourishment can manifest itself as overweight, obesity or lifestyle diseases such as diabetes in individuals. Under-nourishment can manifest itself as underweight, stunting and wasting in individuals; as well as deficiencies of micronutrients, such as vitamin A, iron, iodine, zinc and folic acid. Nutritional status is an outcome of processes and structures in a society that regulate access to resources, education, economic assets and opportunities (WHO, 1999).

A community currency is a means of exchange used in a specific local network of as a supplement to the national currency; thus it is used together with the national currency and does not replace it. CCs can be produced in different monetary values and are used in designated businesses to enable purchase of various goods and services such as food, clothing, education and health.

Figure 1: Community currency in Kenya (GEF, 2015).

Figure 2: Community currency in Spain (Hughes, 2015).

For a community to be adequately nourished, its members need to have optimum intake and utilization of energy and nutrients, together with disease control, to maintain well-being, health, and productivity. Community currencies lead to the increase of the purchasing power of individuals & can affect the nutritional status of a community, as food is a major purchased commodity especially in urban areas, since they do not

have agricultural land to grow their own. This study will thus focus on evaluating the ability of a community to acquire food and nutrition security as a result of community currencies acting as an economic aid.

2.2. FOOD AND NUTRITION SECURITY

Food security has been defined by FAO of the United Nations as existing "when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life" (FAO, 2002; UNSCN, 2010). Importantly, this definition stipulates that food should be available in sufficient quantity as well as in sufficient quality, should be culturally acceptable and should be available at all times throughout the year (Ruel, 2013).

Nutrition security, by contrast, exists when, in addition to having access to a healthy and balanced diet, people also have access to adequate caregiving practices and to a safe and clean environment that allows them to stay healthy and utilize the foods they eat effectively. For young children, for example, this means that they have enough of the right foods, and this includes breast milk for up to two years of age, along with appropriate quantity and quality of complementary foods starting at six months of age because breast milk can no longer fulfill all of the infant's nutrient needs after that age. In addition, young children also need caregivers who have the time, education, knowledge, physical and mental health, and nutritional well-being to care for them adequately. Adequate caregiving means that caregivers are able to attend to all their children's multiple needs, including adequate feeding, hygiene, health-seeking practices and supportive parenting. Finally, to be nutrition secure, young children must also be free of repeated (chronic) or acute infections, which interfere with absorption and utilization of food and nutrients for body functions. (Ruel, 2013)

Borrowing from both definitions, the United Nations Food and Agriculture Committee on World Food Security defined "food and nutrition security" as, a situation that exists when all people at all times have physical, social and economic access to food, which is consumed in sufficient quantity and quality to meet their dietary needs, requirements for growth and food preferences, and is supported by an environment of adequate sanitation, health services and caregiving. This allows for appropriate utilization of food and nutrients by the body and therefore creates the conditions for a healthy and active life (Ruel, 2013).

2.3. VULNERABLE GROUPS AFFECTED BY FOOD AND NUTRITION INSECURITY

Most vulnerable groups of a population to food and nutrition insecurity are infants and young children during their first two years of life, pregnant and lactating women. The vulnerability of these two groups comes from the fact that they have very high requirements for essential nutrients such as vitamin A, iron, zinc, iodine and others, during these periods. (Ruel, 2013)

For children, these nutrients are necessary for them to grow and for their brain to develop; for pregnant women, they are necessary because they have to provide extra calories and nutrients to their growing fetus; and for lactating mothers, they are necessary because the mothers are producing breast milk, and this requires consuming extra calories and micronutrients so that they can produce enough milk and for the milk to be of adequate quality. (Ruel, 2013)

The critical importance of this period (pregnancy, lactation and first two years of a child's life), which is now referred to as the "First 1,000 Days" from conception to the two years of age, was made clear in a groundbreaking piece of research published by The Lancet Journal in 2008 and further emphasized in a new Series on Maternal and Child Nutrition published in the same journal in 2013. Both series highlight that not only is this 1,000-day period the time when mothers and children are most at risk of malnutrition, but that it is also the period when they can most benefit from interventions to prevent the negative consequences of malnutrition. (Ruel, 2013)

In fact, what happens during the first 1,000 days determines the future of an individual, and nutritional damage that happens during this period is largely irreversible. Children undernourished during this period are shown to have delays in mental development, are less likely to perform well and to stay in school, have less skilled jobs and lower income in adulthood, and are at increased risk of developing problems of overweight and obesity and other chronic diseases such as heart diseases, diabetes and some types of cancers in adulthood. (Ruel, 2013)

2.4. FOOD CRISES AND COPING STRATEGIES IN KENYA

The food price crisis is posing a major challenge to the country. A combination of factors, including consecutive droughts, post-election violence, low food grain production and global food price hikes led to a significant increase in food prices in Kenya, sparking a food crisis in 2008–9. This affected about 4.1 million people in

urban informal settlements, out of a total of 9.5 million people in the country. Between 2007 and 2008, the price of maize meal increased by 133%, beans by 96%, vegetables by 55%, and oils and fats by 77% (Mohanty, 2015). Overall, the cost of a basic needs basket for poor households rose by 63%. In addition to this, impoverished urban households are estimated to spend 60–80% of incomes on food, making them more vulnerable to food price volatility (Baiphethi and Jacobs, 2009; Cohen and Garrett, 2010). According to a report commissioned by Oxfam in 2008, 90% of households surveyed in the slums of Korogocho and Mukuru, in Nairobi, had reduced the number of meals they eat and their diet diversity. Many had started engaging in high-risk livelihood strategies such as prostitution or begging, and up to 30% of children had been taken out of school.

The poor households often have hazardous coping strategies when it comes to responding to various shocks in their environment, such as famine, floods, disease, economic instability or political instability. These strategies often have detrimental effects to their well-being; as household food security deteriorates, the greater consequences there are for health and nutrition of the household members.

The classic scenario is when there is a diversification or change in livelihood activities when household members move from the rural areas, to the urban slum areas. This often brings a change to selection of cheaper, lower-quality and less preferred foods, as food access is mainly by purchasing power and not own production, there is a need to distribute expenditure on other available amenities such as toilet services, rent, electricity or fuel, and there is a high rate of poverty in these areas.

When poverty still persists, the household may need to reduce expenditure on non-essential or luxury items. They may even need to sell non-productive assets. This has the effect of reduced food diversity and poor nutrient intake, as some household members may be prioritized more in the consumption of food (example, the working father may be served an evening meal, while the children miss out), which will lead to a reduced size or number of meals in a household.

Children in the household may be forced to drop-out of school, which will further increase their chances of remaining in a poverty-struck rate in the future. Households may also begin to purchase on credit, leaving them indebted. Any other remaining asset will need to be sold, expenditure on basic items such as food and

water diminish greatly and most often members get involved in illegal activities such as theft or drug abuse so as to survive or cope.

By this point, the household members will have moved from having a reduced size or number of meals, to sharing meals with their neighbors, to begging for food, to skipping entire days without eating. There will be a depletion of nutrients in their bodies, lower immunity, poor growth and increased mortality rates (Maxwell and Caldwell, 2008). With these outcomes in mind, community currencies have great potential in becoming a nutrition intervention once it is studied and evaluated from a nutritional perspective.

2.5. FOOD SECURITY POLICES/ LEGISLATION

2.5.1. Global Food Security Act, 2015

This is a bill introduced in the 114th American Congress on March 24, 2015 to be enacted by the Senate and House of Representatives of the United States of America. It was defined as a bill to authorize a comprehensive, strategic approach for United States foreign assistance to developing countries to reduce global poverty and hunger, achieve food security and improved nutrition, promote inclusive, sustainable agricultural-led economic growth, improve nutritional outcomes, especially for women and children, build resilience among vulnerable populations, and for other purposes. (Library of Congress, 2015)

2.5.2. National Food and Nutrition Security Policy (NFNSP), 2011

This is a documented policy published by the ASCU, Government of Kenya in 2011. The document 'describes' itself as "the policy of the government that all Kenyans, throughout their life-cycle enjoy at all times safe food in sufficient quantity and quality to satisfy their nutritional needs for optimal health." Its general objectives include:

i. To achieve good nutrition for optimum health of all Kenyans.
ii. To increase the quantity and quality of food available, accessible and affordable to all Kenyans at all times.
iii. To protect vulnerable populations using innovative and cost-effective safety nets linked to long-term development.

It covers the multiple dimensions of food security and nutrition improvement such as food availability and access, food safety, standards and quality control, nutrition improvement, school nutrition, nutrition awareness, food security and nutrition information, early warning and emergency management, institutional and legal

framework, financing and strategic approaches for policy implementation, monitoring and evaluation. (NFNSP, 2011)

It has been purposefully developed to add value and create synergy to existing sectoral and other initiatives of government and partners. It recognizes the need for multi-public and private sector involvement, and that hunger eradication and nutrition improvement is a shared responsibility of all Kenyans. (NFNSP, 2011)

2.5.3. **The Food Security Bill, 2014**

This is a bill enacted by the Parliament of Kenya, for an Act of Parliament to give effect to Article 43 (1) (c) of the Constitution on the freedom from hunger and the right to adequate food of acceptable quality; Article 53 (1) (c) of the Constitution on the right of every child to basic nutrition and Article 21 of the Constitution on the implementation of rights and fundamental freedoms under the Constitution; and for connected purposes (FSB, 2014).

Its general objectives include:

i. To provide a framework that promotes the realization of the right to freedom from hunger and access to food of acceptable quality as a fundamental human right.
ii. To provide a framework that promotes the elimination and prevention of discrimination of marginalized groups in the access and distribution of food.
iii. To provide a framework that promotes food production, self-sustenance and food security in relation to all persons in Kenya
iv. To provide a framework and mechanisms for the coordinated implementation of the national policy, programmes and plans on food security by the county governments.
v. To provide a mechanism for ensuring that food poor persons access food at all times in adequate quantities and quality through the implementation of State sponsored programmes. (FSB, 2014)

2.6. EXISTING SOCIAL SAFETY NET PROGRAMMES IN KENYA

2.6.1. **Hunger Safety Net Programme (HSNP)**

HSNP is a cash transfer (CT) Programme operated by the GoK with support from the Department for International Development (DfID), Australian Aid and several contracted implementation partners. It has been implemented since 2007 and is currently operational in the four counties of Mandera, Marsabit, Turkana and

Wajir. The HSNP is part of the broader National Safety Net Programme (NSNP) in Kenya, which includes four other social protection schemes: CT – OVC, OPCT, PWSD – CT and UFS- CT. (Merttens et al., 2013)

The NSNP Secretariat in the Ministry of Labour, Social Security and Services (MoLSSS) is responsible for the oversight of Kenya's social protection system. The core objective of HSNP is to reduce poverty, hunger and vulnerability for the poorest in Kenya's arid lands. It does this through providing an unconditional cash transfer paid every two months. It aims to provide 100, 000 households with a cash transfer of Kshs. 4,900 every two months. Beneficiaries of the regular transfer are selected using a combination of a proxy means test and community based targeting. All households registered with HSNP are provided with bank accounts so that, in an emergency, they can receive temporary payments (Merttens et al., 2013).

2.6.2. **Cash Transfer Programmes by NGOs**

In January 2009, the government of Kenya declared the country's food crisis to be a national disaster. According to government statistics, an estimated 9.5 million people were at risk of starvation, with 4.1 million of these living in urban informal settlements. Oxfam and Concern Worldwide developed a joint programme to address this unfolding emergency. (Oxfam, 2012)

They carried out research which indicated that there was a humanitarian crisis unfolding in the slums of Nairobi, where families were finding it increasingly difficult to meet their basic everyday needs. Many people were already struggling to earn a living from the informal sector, in irregular or low-paid work, and the dramatic hike in food prices was having a major effect on nutritional intake among the poorest families in these areas, including Kibera, Mathare, Korogocho, Mukuru Kwa Njenga, and Deep Sea. (Oxfam, 2012)

The programme's overall objective was to improve the food and livelihood security of the most food-insecure households in Nairobi's informal settlements by increasing their immediate access to food and developing longer-term initiatives to improve their access to food and income security.

The food security intervention had three phases. Phase one, from October 2009, was an immediate response to reduce the impact of the food crisis, providing monthly cash transfers to 5,000 households (2,000 in Korogocho and 3,000 in Mukuru) for eight months. Phase two was a medium-term response, providing cash transfers

alongside skills development and training to help poor households set up businesses and engage in more profitable income-earning activities ('exit' interventions). (Oxfam, 2012)

Phase three involved longer-term plans for the implementing agencies and their local partners to influence key stakeholders to develop a coordinated and systematic monitoring approach, which included developing emergency indicators for the urban context. It also involved coordinated advocacy activities to encourage the government to invest in social protection measures for vulnerable urban populations. Their experience showed that developing a strong understanding of women's lives can ensure that cash transfers help them to effectively meet their immediate needs and build successful programmes to meet women's longer-term needs. (Oxfam, 2012)

2.6.3. **Community Currencies**

A non-profit foundation known as, Grassroots Economics, implemented community currency programmes in 5 locations in Nairobi and Mombasa. It has helped more than 700 small businesses and 20 schools take an active role in their own economy and development. They include: Kangemi-Pesa, Gatina-Pesa (Kawangware), Lindi-Pesa (Kibera), Ng'ombeni-Pesa (Mombasa) and Bangla-Pesa (Mombasa). (GEF, 2015)

Local goods and service providers are brought together into a business network and legally registered as a Community Based Organisation. Each business member is guaranteed by other members for an initial amount of credit. These credits are currently printed as vouchers for goods and services, usable at any business in the network. Businesses owners within the network trade both in Kenya Shillings and, to an agreed percentage, the community currency. A percentage of these credits are collected by local networks as a tax and used for social service work – like employing local youth for waste collection and road maintenance. The credits rotate around the community helping to connect excess supply and demand for people who lack access to shillings. For example, a mother can use her own labor to pay for her child's education, by denominating her goods and services into a tradable credit. (GEF, 2015)

As a sustainable socio-economic development tool they offer an innovative way to improve conditions by: providing communities with access to interest-free credit; providing a mechanism for communities to finance social services such as education, environmental and health services; and increasing local trade, employment, small business development and overall local economic stability. CC's give communities a way to create their

own mutual-credit-clearing system (barter exchange) to build economic resilience and to self-fund community development programmes. These programmes are effective for creating long term sustainability and ultimately don't need donor inputs. (GEF, 2015)

With community currencies, businesses (including schools, the self-employed and informal sector workers) form a network which creates a credit backed directly by the goods and services of the businesses. This creates a form of interest-free credit that the community members can use when the national currency is scarce. Membership fees in these networks (in the local currency itself) can then be used for community development programs. (GEF, 2015)

Despite its achievements, the CC programmes had legal obstacles which one should consider if planning to launch a similar programme. After the launch of the Bangla-Pesa model and subsequent success of helping improve local markets the programme brought on the attention from Kenyan authorities who initially claimed the programme was illegal. After a long court battle the programme was deemed legal and with the cooperation of local Ministers of Parliament as well as police we were assisted to reopen the Bangla-Pesa program. (GEF, 2015)

2.7. GAPS IN KNOWLEDGE

There has been an upcoming global-wide use of food vouchers as a social safety net to provide food to the vulnerable in society. However, this social protection tool has failed in most countries due to leakage, poor administration and high costs of funding; making it unsustainable. Community currencies on the other hand offer a sustainable method of economic and livelihood development at a community level. Despite its many merits, there is minute knowledge on how this tool is influencing the nutritional status of communities and whether it can be used as a nutrition intervention.

3.0. DESIGN AND METHODOLOGY

3.1. STUDY DESIGN

The study design of choice was the non-experimental (observational) comparative study (Gibney et al., 2009). The study had no control over the exposure because the participants were already freely assigned to the exposure or not; in this case, the use of community currency. The subjects of the study were divided into two groups, community currency members and non-members, which were then compared in terms of nutritional intake and linked to their use of the community currency.

3.2. STUDY SITE DESCRIPTION

Kibera is the largest slum in Africa and located within the city of Nairobi in Kenya. The name 'kibera' means "a bleak or destitute forest" (French, 2011). The exact population size of Kibera had been a subject of debate; in 2003 a United Nations' report concluded that Kibera was the biggest slum in the world and recently estimated its population at 1.5 million (French, 2011). In contrast, the 2009 Kenya Population and Housing Census reported Kibera's population at 170,070 people. This was confirmed in an estimation done by the French Institute for Research in Africa (IFRA) Nairobi and Keyobs (a Belgian company) using Geographical Information Systems (GIS) methodology and a ground survey. The results showed that there are approximately 200,000 residents, instead of the 700,000 to 1 million figures which were often quoted (Desgroppes, 2011). As illustrated in the map below, Kibera is divided into thirteen villages namely, Kianda, Soweto West, Raila, Gatwekera, Kisumu Ndogo, Makina, Kichinjio, Mashimoni, Kambi Muru, Lindi, Laini Saba, Silanga and Soweto East.

Figure 3: Map of Kibera settlement (Map Kibera Project, 2008)

According to the KNBS 2009 Kenya Population and Housing Census, the population of the nine sub-locations is as follows; Silanga (17, 363 people, 6, 164 households), Soweto (24, 191 people, 8, 414 households), Laini Saba (28, 182 people, 9, 927 households), Kibera (9, 786 people, 3, 237 households), Makina (25, 242 people, 7, 270 households), Lindi (35, 158 people, 11, 551 households), Gatwekera (24, 991 people, 7, 926 households), Bomas (16, 646 people, 4, 601 households) and Olympic (29, 356 people, 8, 327 households). (Abdulla, 2011)

3.2.1. **Food and nutrition**

Food in the area is mostly purchased, due to lack of agricultural space. Fresh food products such as meats, fruits and vegetables are sold in markets or shops, along with other processed foods such as rice, bread, milk and flour. Ready-made foods (*githeri*, *chapati*, stews and soups) and other street foods (*mandazi* and samosa) are sold at different times of the day including the evenings, for those who do not have time to prepare their own food.

3.2.2. **Housing and electricity**

The average size of shacks in this area is 3.5m x 3.5m built with mud walls coated with concrete, a corrugated tin roof and a soil or concrete floor. The rent is about Kshs. 700 per month. These shacks often house up to 8 or more people, many sleeping on the floor. Only about 20% of Kibera has electricity. UN-Habitat is in the process of providing it to some parts of Kibera – this will include street lighting, security lighting and connection to shacks. (Mills, 2015)

3.2.3. **Water and sanitation**

Previously, Kibera had no piped water and it had to be collected from the Nairobi dam. The dam water is not clean and causes water-borne diseases like typhoid and cholera. Currently, there are two mains water pipes into Kibera sponsored by the municipal council and the World Bank respectively. Residents collect water at a fee. Many residents harvest rainwater from their roofs; this is generally a good practice but very hazardous in this area due to flying toilets and produces highly contaminated water. The use of flying toilets in the area has decreased as the need for toilet facilities was realized by local entrepreneurs. Use of latrines in the area can be either private or communal where a service fee is charged. Most sewage runs downhill in open trenches, resulting in stagnation and water pooling problems that breed insects and odor. (Mills, 2015)

3.2.4. **Medical services**

In Kibera, charitable organisations such as African Medical and Research Foundation (AMREF), Doctors Without Borders (MSF), the United States Centers for Disease Control and Prevention (CDC), churches and others are the main providers of medical services (Mills, 2015). Medical services offered include physiotherapy for the disabled, family planning, mother and child health services, cancer screening, vaccinations, provision of anti-malaria drugs, Voluntary Counselling and Testing (VCT) and general consultations (UN-Habitat, 2014).

These services are also provided by a collaboration of the public and private sectors such as Afya Research Africa organisation and the Ministry of Health, in Soweto East village. As a result, critically ill patients are referred to receive attention from specialist doctors based in Kenyatta National Hospital and Gertrude's Children's Hospital. (UN-Habitat, 2014)

3.2.5. **Social services**

Kibera has a wide livelihood of sports, education, religion and social centres. Sports services in the area are mainly provided by youth empowerment groups, with the aim of preventing the youth's involvement in criminal activities and unemployment. An example of this is the Kibera Celtic Football Club, founded in 2008, hosting teams of men and women players (French, 2011).

Primary and secondary school education services are offered by either the public or private sector. A high percentage of private schools, give formal education in an informal setting as they lack enough books and classrooms to accommodate the large number of students. Whereas in public schools, the missing tool is quality education which is believed to be a result of the introduction of free primary education. Moreover, most private schools have not advanced beyond classes four and five, which forces parents to turn to public schools for upper primary education. (Oduor, 2014)

Multi-resource centres have been developed in various villages through funding from private sector. Such centres use photography, drama, music, writing and group discussions to mobilize and educate the community. The German BASF Foundation and UN-Habitat, funded the Soweto East Resource Centre which provides a communal space for social gatherings, toilet facilities, cyber café with Information Communication Technology skills training for children and a daycare centre (UN-Habitat, 2014).

The Daughter's United Center is a reproductive health and women's rights facility for 11 to 18 year-old girls in Kibera. The center provides a safe space for adolescent girls in Kibera to explore prevalent issues such as violence against women, HIV/AIDS, unequal access to education, lack of reproductive health care and demanding domestic responsibilities. (CHMI, 2010)

3.3. STUDY SITE SELECTION

The study selected Kibera informal settlement because it is the largest slum in Kenya and is thought to give a good representation of all the informal settlements in the country. It has a good diversity of cultures, gender, age and socio-economic status. Most importantly, it was chosen because the community currency programme was already implemented in Lindi village since August 2015.

3.4. SAMPLE SIZE DETERMINATION

3.4.1. Sampling procedure

The Cochran formula (Israel, 2013) was used to calculate the sample size for this research as shown below, where:

n = minimum sample size,

$\mathbf{Z^2_{\alpha/2}}$ = desired level of confidence at 95%,

p = estimated proportion of undernourishment as an indicator of food and nutrition insecurity; found to be 21.2% according to FAO (FAO, 2015),

$\mathbf{d^2}$ = degree of accuracy required at 10%.

$$\mathbf{n = \frac{Z^2_{\alpha/2} \cdot p\,(1 - p)}{d^2}}$$

$$n = \frac{1.96^2 \text{ X } 0.212\ (1 - 0.212)}{0.1^2} = 64.18 = \textbf{64 households}$$

3.4.2. Sampling frame and technique

The sampling frame consisted of households in Lindi selected by a simple random sampling technique. This was done by randomly selecting and interviewing household representatives in their places of residence or work. Lindi-Pesa members were located and selected by the assistance of the programme volunteers.

3.4.3. **Selection of a Key Informant**

The key informant in the study was selected to provide more detailed information and create a better understanding of how the community currency programme run by Grassroots Economics Foundation works and operates. Therefore, a community currency programme coordinator was selected because of their knowledge and experience in implementing the programme.

3.5. TYPES AND SOURCES OF DATA

Qualitative and quantitative data were collected. Qualitative data described the lifestyle specific information about the values, opinions, behaviors and social contexts of the target population. Its source was the key informant interview and 24 hour dietary recall. Quantitative data on the other hand confirmed the stated hypotheses by quantifying variations, predicting relationships and describing characteristics of the target population, numerically. Its sources were the dietary diversity score and food frequency assessment.

3.6. DATA COLLECTION METHODS AND TOOLS

3.6.1. **Key Informant Interview (KII)**

KIIs are a type of in-depth, face-to-face interview in which the interviewer collected information by posing open-ended questions to the selected respondent, to obtain their perspectives on the research topic. This method was selected because the interviewer could easily explain the objectives of the research to the respondent and it had an immediate high response rate (Mack et al., 2005).

The interview was conducted using the following steps:

i. Selection of a quiet, comfortable and private venue to carry out the interview.
ii. Introduction of the researcher and the study objectives to the key informant.
iii. Explanation of what the KII entailed, consent for written, audio and visual records of the interview and approval of the key informant to be interviewed (ANNEX I).
iv. Use of the pre-tested question guide (ANNEX II) by the researcher to pose questions to the key informant, while listening and recording the key informant's responses.
v. Closure of the interview and appreciation of the key informant for participating in the study.

3.6.2. **24 hour dietary recall**

This dietary assessment method was used to collect detailed information on types of foods, their ingredients and their portions, consumed by the target households in the past 24 hours to evaluate their dietary intake. It

was selected because it was less time consuming, inexpensive, easy to administer and had a low respondent burden. It was carried out using the steps below:

i. Selection of a quiet, comfortable and private venue to carry out the interview.
ii. Introduction of the researcher and the study objectives to the respondent.
iii. Approval for participation of the respondent and taking written records of the interview (ANNEX I).
iv. Record of demographic information of the household (ANNEX III, Section A).
v. Explanation of what the 24 hour dietary recall entailed.
vi. Use of the pre-tested 24 hour dietary recall form (ANNEX III, Section B) by the researcher to inquire about the household members' food consumption in the past 24 hours and recording the responses.
vii. Cross-check and correction of omissions or mistakes.
viii. Transition to the next section of the interview.

3.6.3. **Dietary Diversity Score (DDS)**

Dietary diversity score is a quantitative measure of food consumption that was used to reflect access to a variety of foods and the nutrient adequacy of a household's diet. It was selected because it was a rapid, user-friendly and easily administered low-cost assessment tool. This study used the 24 hour dietary recall as a platform to identify dietary diversity, using food items already mentioned by the respondent in specific food groups. The steps used were as follows:

i. Explanation of what the DDS entailed.
ii. Use of the pre-tested DDS form (ANNEX III, Section C) by the researcher to inquire about the household members' food group consumption and their procurement means, and recording the responses.
iii. Calculation and record of the total dietary diversity score.
iv. Transition to the next section of the interview.

3.6.4. **Food Frequency Questionnaire (FFQ)**

A simple FFQ was used to determine how frequently the target households consume high-fiber starches, highly bio-available proteins, fortified foods and prestigious foods. The steps used were as follows:

i. Explanation of what the FFQ entailed.
ii. Use of the pre-tested FFQ form (ANNEX III, Section D) by the researcher to inquire about the household members' food consumption frequency and recording the responses.
iii. Closure of the interview and appreciation of the respondent for participating in the study.

3.7. DATA ANALYSIS

3.7.1. Qualitative data analysis

The KII was analyzed by coding the data transcript according to participant's responses. This involved:

i. Reading the transcript to search for the major themes or opinions.
ii. Primary coding; selection of relevant words, phrases, concepts or differences by highlighting text or making marginal notes.
iii. Secondary coding; review of primary codes and labelling them into categories.
iv. Data conceptualization; identifying the relation of codes relate to each other and to the research topic.
v. Stating and discussing the final results.

On the other hand, 24 hour dietary recalls from each household were analyzed by means of the NutriSurvey software. Data from each household form was entered into the software for daily nutrient and caloric analysis. Further analysis was done using Microsoft Excel to compare the average daily energy/ caloric, macronutrient, vitamin and mineral intakes between the CC members and non-members.

3.7.2. Quantitative data analysis

Dietary Diversity Scores (DDS) were analyzed using the SPSS software by comparing the score frequencies of Lindi-Pesa members and non-members and by Chi-Square (χ^2) test of independence. While the FFQ data was analyzed using the SPSS software by means of an Independent Sample t-test.

These methods were used to show whether the consumption of high-fiber starches, highly bio-available proteins, fortified foods and prestigious foods in CC members was significantly different from that of non-members.

3.8. DATA QUALITY ASSURANCE

The KIIs used typed transcripts of audio recordings and notes on the respondents' answers. These dual tools provided accountability for each other and improved data clarity. Additionally, probing for more information during the dietary assessments improved data quality by avoiding omissions.

A multiple pass 24 hour recall was also used to avoid under-reporting. The first pass involved developing a quick list of the respondent's meals in the past 24 hours. The second pass inquired more details on the quick

list developed and the third pass involved data review, probing and clarification of portion sizes by the researcher.

3.9. GANTT CHART

The logical list of activities that were carried out in pursuit of the research objectives were as shown below.

Table 1: Gantt chart

		MONTHS																		
		Dec			Jan				Feb				Mar				May			
		NUMBER OF WEEKS																		
No.	**Activities**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**
1.	Project research and proposal writing while consulting the Supervisor.	**X**	**X**																	
2.	Project proposal presentation to the Department of Food Science, Nutrition and Technology, University of Nairobi panel.			**X**																
3.	Making necessary amendments on proposal and further consultation with the Supervisor.							**X**	**X**											
4.	Proposal approval by Supervisor.									**X**										
5.	Collection of project funds from the Department of Food Science, Nutrition and Technology, University of Nairobi.									**X**										
6.	Proposal presentation to the Grassroots Economics Foundation (GEF) Director for approval.										**X**									
7.	Printing of KII question guide and nutrition assessment forms to be used for pre-testing.										**X**									
8.	Meeting with GEF area coordinators of the Lindi-Pesa programme, health or social workers and community leaders in target villages to introduce the study and familiarize self with the target areas.										**X**									
9.	Pre-testing data collection tools.										**X**									
10.	Making any required improvements to the data collection tools.										**X**									

		MONTHS																	
		Dec			Jan				Feb				Mar				May		
		NUMBER OF WEEKS																	
No.	**Activities**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**
11.	Mass printing of the rectified data collection forms.										**X**									
12.	Data collection by KII.										**X**									
13.	Data collection by 24 hour dietary recall, DDS, FFQ and MUAC tools in households of Lindi village.											**X**								
14.	Data cleaning and entry.												**X**							
15.	Data analysis and interpretation.												**X**	**X**						
16.	Report compilation.													**X**	**X**					
17.	Supervisor consultation on the project report findings.													**X**	**X**		**X**			
18.	Project report presentation to the Department of Food Science, Nutrition and Technology, University of Nairobi panel.																	**X**	**X**	
19.	Project report presentation to the Grassroots Economics Foundation (GEF) Director.																			**X**
20.	Closing of project.																			**X**

3.10. BUDGET

Table 1: Total budget

Activity	**Amount in KSHS.**
Respondent reimbursement (Kshs. 50 per respondent; a requirement by the CC programme implementers).	1600/=
Transportation (estimated 6 days of fieldwork)	750/=
Final mass printing of assessment forms.	450/=
Project report printing (approximately 70 pages)	450/=
Final project proposal printing and binding (47 pages black and white printing; 7 pages colour printing).	350/=
Field escort reimbursement.	300/=
Miscellaneous	200/=
TOTAL	**4,100/=**

4.0. DATA RESULTS, PRESENTATION AND DISCUSSION

4.1. SOCIO-DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

4.1.1. Household Characteristics

The study established that 16 of the households represented had four members (25%), 12 households had three members (18.8%), 9 households had five members (14.1%), 7 households had two members (10.9%), 6 households had six members (9.4%), 6 households had one member (9.4%), 3 households had seven members (4.7%), 3 households had nine members (4.7%) and 2 households had eight members (3.1%). The distribution of the relationship to the household head is shown in the figure below.

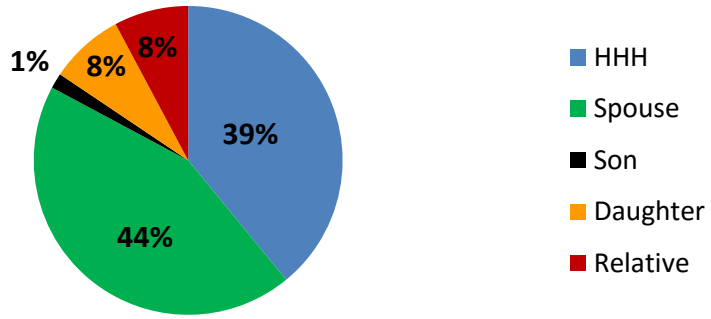

Figure 4: Relationship to household head (HHH)

4.1.2. Gender

The respondents in the study were found to be 20.3% male and 79.7% female. The higher number of females was due to their role in preparing household meals; therefore they were the gender of preference.

4.1.3. Age

The age groups of respondents in the study were as shown below:

Table 3: Respondents' age groups

Age group (in years)	Frequency	Percentage
17 – 20	5	7.8%
21 – 30	35	54.7%
31 – 40	12	18.8%
41 – 50	9	14.0%
Above 50	3	4.7%
TOTAL	64	100%

4.1.4. **Religion**

The study's respondents were found to be 58 Christians (90.6%), 4 Muslims (6.3%) and 2 traditional religionists (3.1%). This may suggest that the majority of Lindi, Kibera residents are Christians.

4.1.5. **Vulnerable Groups**

This was used to classify the vulnerability of a respondent's health based on their stage in the life cycle or the presence of disease. It was found that 12.5% of the respondents were pregnant women, 10.9% were lactating women, 4.7% were elderly (above 50 years) and 1.6% was adolescents. The remaining 70.3% were not classified as vulnerable. Errors were accounted for as some respondents were unwilling to reveal their vulnerability to HIV/AIDS.

4.1.6. **Occupation**

The study found the distribution of occupation to be as follows:

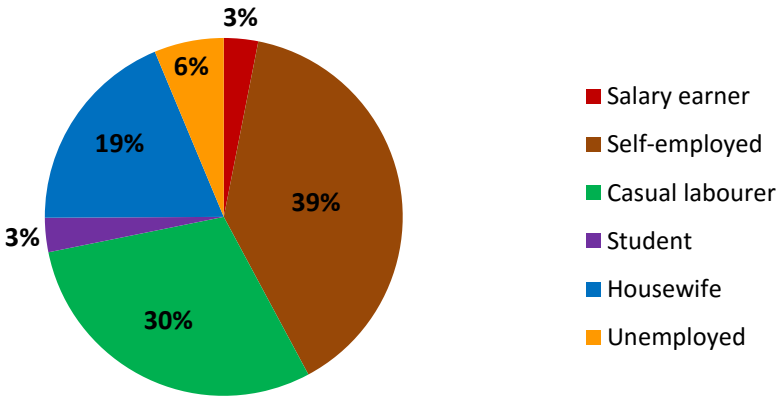

Figure 5: Occupation distribution of respondents

4.1.7. **Lindi-Pesa Membership**

In this research study, 43.8% of the respondents were members of the Lindi-Pesa programme and 56.3% were non-members.

4.2. KEY INFORMANT INTERVIEW

The KII interview clarified more on the implementation of the community currency programme. The programme's main objective is to provide a financial means of accessing goods and services when community members have less national currency. In Kenya, it initially begun in Bangla, Mombasa, with the aim of assisting parents to pay school fees for their children. The programme later evolved and enabled its members to use the currency to purchase accessible goods in the community, except beer and any illegal goods.

Figure 6: Gatina-Pesa (Back side)

Figure 7: Gatina-Pesa (Front side)

To attain membership, an individual must be a business owner and trained on how the CC programme operates. A starting fee of Kshs. 400/= worth of community currency is given to a new member, free of charge. The new member can now buy goods and services from other members at a certain percentage of CC and national currency. Goods and services transacted by the means of CC include vegetables, flour, milk, fish, street foods *(chapati, mandazi and chips)*, charcoal, school fees, clinics and in food bandas/hotels are only but a few.

The community members are also involved in implementing the programme. Each community has a committee made up of a chairman, secretary, treasurer and volunteers. This gives a sense of ownership of the programme by the community and enables them to air opinions and create solutions. For instance,

misconceptions of the programme have raised challenges in its implementation. Most community members expected to be given cash/ national currency when they joined the programme, and rejected to join as they saw no financial value in the voucher to be used as a CC. As a result, the programme volunteers worked together with other committee members to train and educate people on how they can benefit from the programme. A market day is also organized every month, to bring the community together to purchase items. This facilitates the use and rotation of the CC, builds relationships among CC members, enables more people to access basic goods and services, and encourages non-members to join the programme.

It was also established that the CC programme run by GEF is planning to rebrand itself as Sarafu-Credit, as it aims to advance from a community-based programme to a nation-wide programme. Efforts have been made to create awareness and advertise the programme through media like Radio Citizen, Pamoja Radio and Pwani Radio.

Figure 8: Rebranding of the community currency in Kenya

Furthermore, it was reported that there has been poor food and nutrition security status in urban informal settlements, especially among school-going children. Their poor nutritional status was affecting their academic performance, but since their families joined the programme, some improvements have been noted. Interventions like creating kitchen gardens in schools have been helpful to the community. The

garden products are used to feed the school-going children and some are purchased with the CC during market days.

4.3. NUTRITIONAL ASSESSMENTS

4.3.1. 24 Hour Dietary Recalls

The study established that average daily energy intake of both Lindi-Pesa members and non-members was below the bare minimum caloric intake of 2100 kcal/person/day. This trait was attributed to the poverty rates of urban informal settlements. However, non-members had a higher average consumption than members of the Lindi-Pesa programme by 163.12 kilocalories, as illustrated below. This may suggest that the Lindi-Pesa currency does not provide additional financial support for users to purchase food items; or that the Lindi-Pesa members are focused on using the currency to cater for other needs and purchase non-food items.

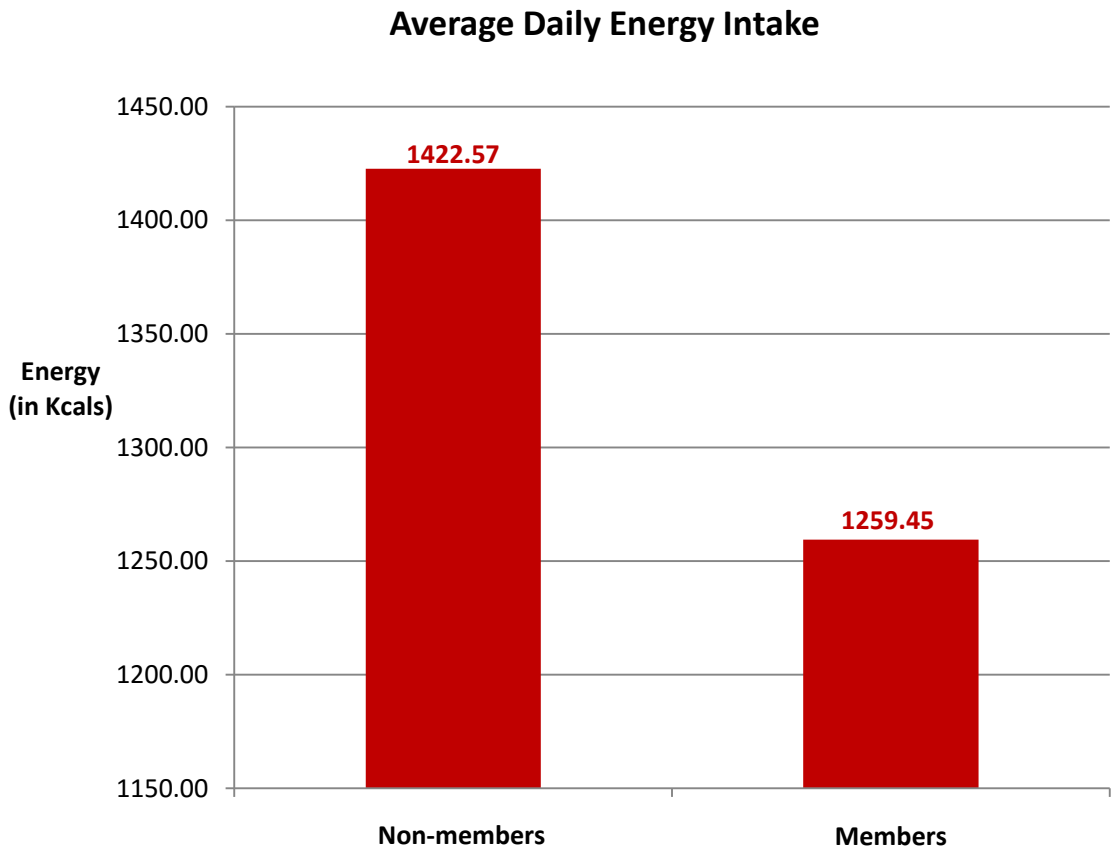

Figure 9: Graph of average daily energy intake

Non-members of the programme also had higher average daily intakes of macronutrients, dietary fiber, polyunsaturated fatty acids (PUFAs), cholesterol, vitamins and minerals with the exception of vitamin D and calcium (though with negligible differences) as shown below. This indicated lower nutrient intake of Lindi-Pesa members as compared to non-members.

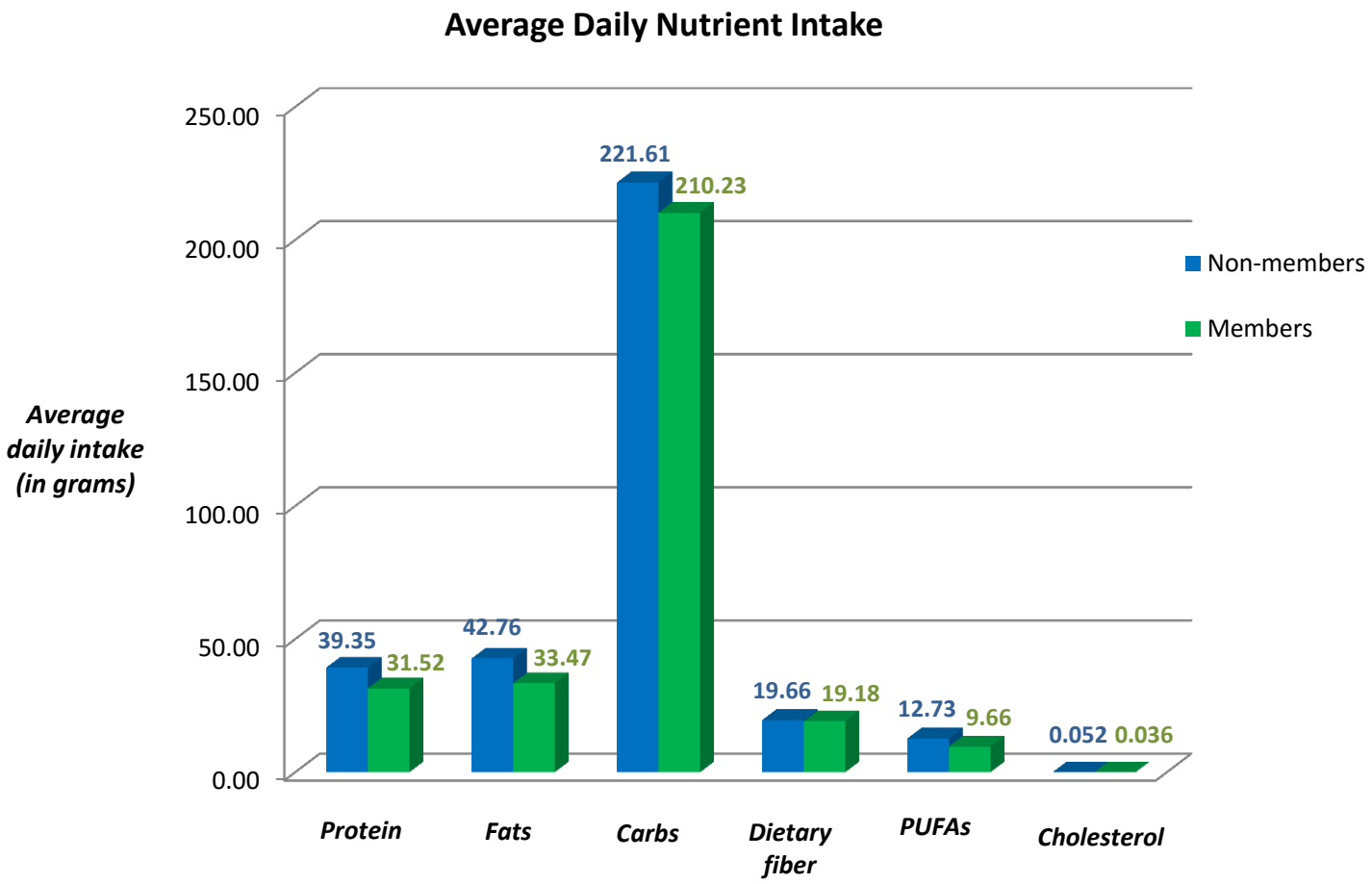

Figure 10: Graph of average daily nutrient intake

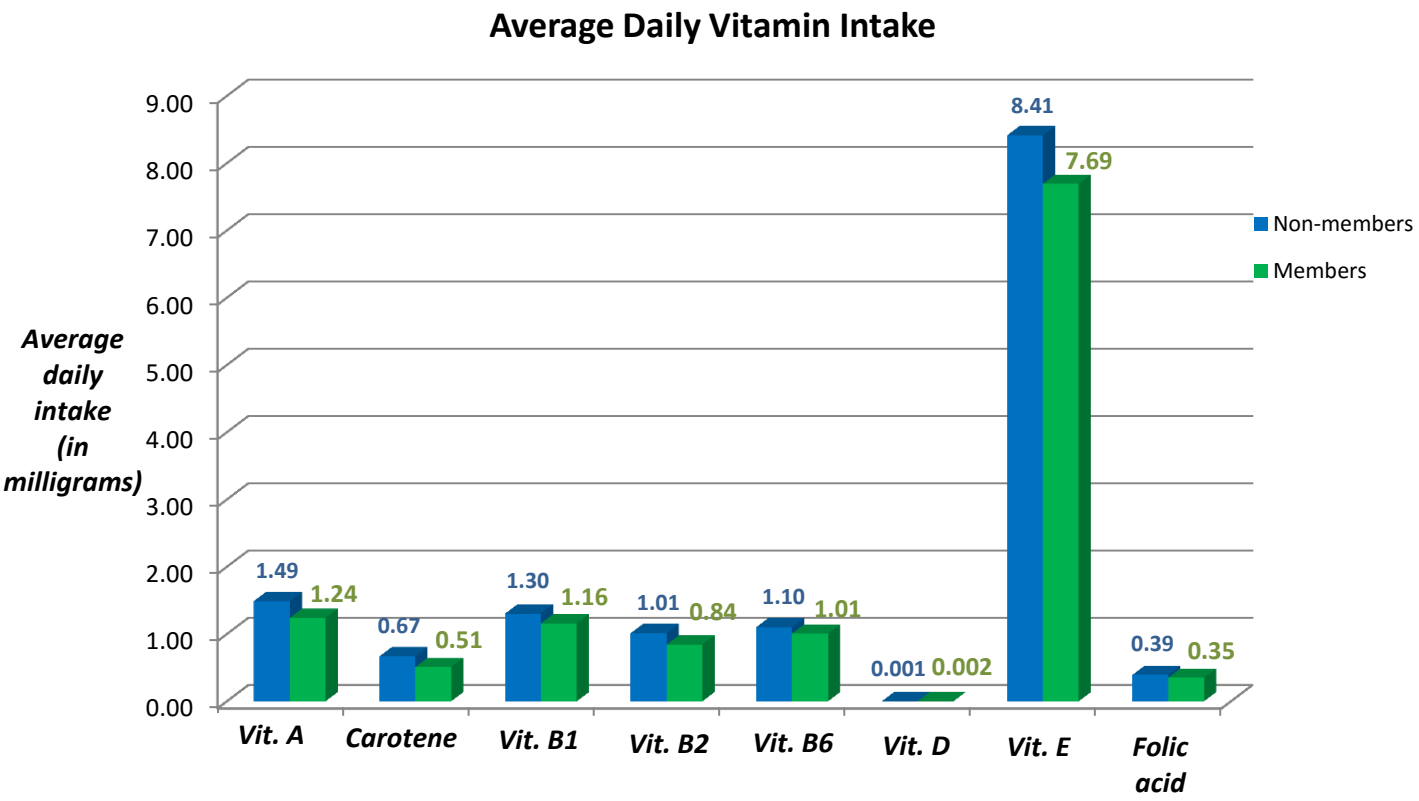

Figure 11: Graph of average daily vitamin intake

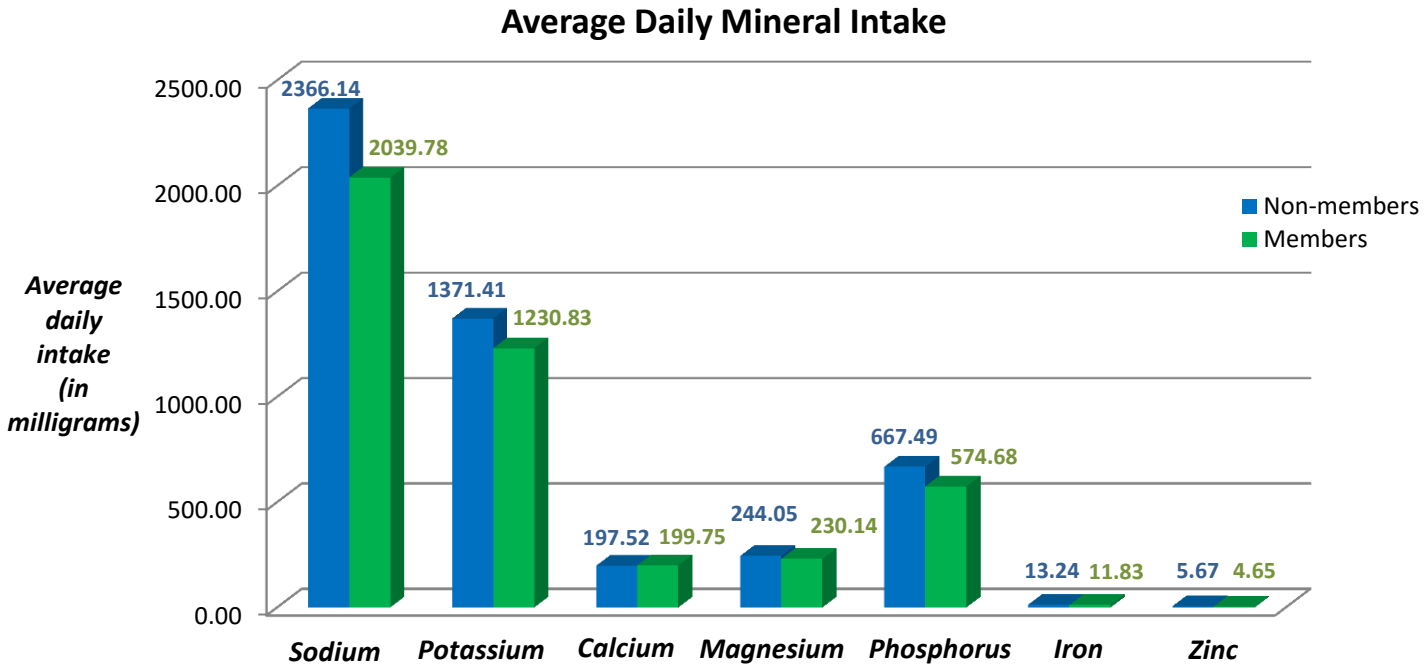

Figure 12: Graph of average daily mineral intake

4.3.2. **Dietary Diversity Score (DDS)**

The Chi-Square test revealed that there was no statistical significance in the differences of dietary diversity based on use of community currency. As shown in the table below, all p-values for the different food groups and the total dietary diversity score were greater than 0.05. It was also established that majority of all households in the population had a DDS of 3 out of 8 as shown in figure __. Therefore, the null hypothesis (H_0) was accepted and the alternative hypothesis (H_1) was rejected; that no association exists between dietary diversity and community currency in the sampled population. This was attributed to the fact that both Lindi-Pesa members and non-members are exposed to the same food markets, thus having similar food variety and quality.

Table 4: Chi-Square analysis of DDS

FOOD GROUP	**CHI-SQUARE TEST (p-value)**
High fiber starches	0.728
Organ meats	0.374
Meat and fish	0.107
Eggs	0.795
Milk or milk products	0.570
Fortified foods	0.374
Sweets, desserts and snacks	0.118
Outdoor foods	0.135
Total DDS	0.585

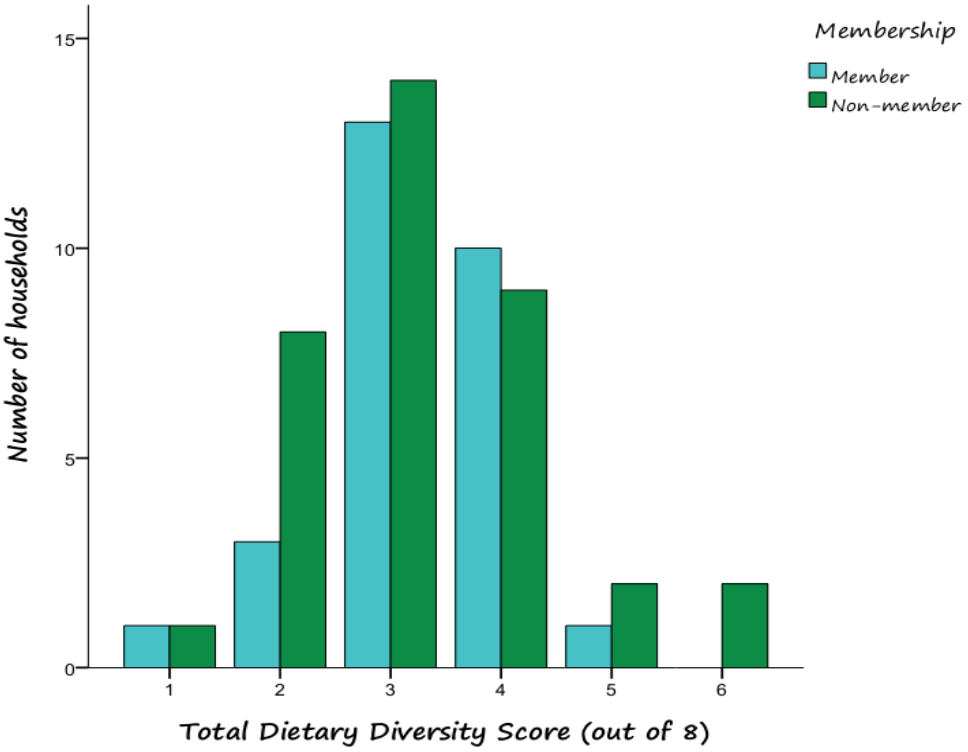

Figure 13: Graph of total DDS

The DDS assessment also established that 67.86% of Lindi-Pesa members used the national and community currency to purchase food items, while 32.14% of the members used the national currency only to purchase food items. No non-member was found to use the community currency in purchasing food items; this suggests that there were minimal inclusion errors in the programme implementation.

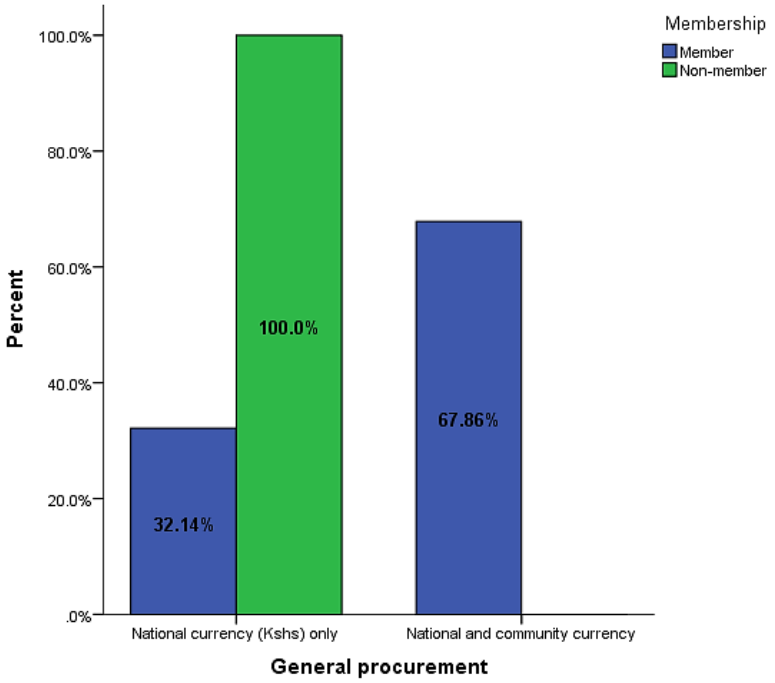

Figure 14: Graph of food procurement means among Lindi-Pesa members

4.3.3. **Food Frequency Questionnaires (FFQ)**

The study established that there was a statistical significance in the differences of consumption frequencies of most food groups, based in the use of community currency. Non-members of the programme had higher consumption frequencies of all high fiber starches, high biological value proteins (except goat, pork and chicken), fortified foods (except margarine) and all prestigious foods assessed in the study. Therefore, the null hypothesis (H_o) was accepted and the alternative hypothesis was rejected; there is an association of food frequencies and use of community currency.

It was also found that there was no statistical significance in the differences of consumption frequencies for goat, pork, chicken and fortified margarine between the two memberships. This was found to be as a result of their costly prices and high value; majority of the respondents considered them to be consumed only for special occasions.

Table 5: Independent sample t-test analysis of FFQs

Food group	Food item	T-test (p-value)	Interpretation
High fiber starches	Ground flour	0.918	There was a statistical significance in the differences of consumption frequencies based on memberships ($p>0.05$).
	Whole meal bread	0.951	
	Brown rice	0.382	
	Arrow roots	0.778	
	Sweet potatoes	0.526	
	Plantains	0.291	
High biological value proteins	Liver	0.068	
	Other offal meats	0.524	
	Beef	0.574	
	Goat	0.020	There was no statistical significance in the differences of consumption frequencies based on memberships ($p\leq0.05$).
	Pork	0.003	
	Chicken	0.004	
	Fish	0.784	There was a statistical significance in the differences of consumption frequencies based on memberships ($p>0.05$).
	Eggs	0.675	
	Milk	0.276	

Fortified foods	Flour	0.398	There was a statistical significance in the differences of consumption frequencies based on memberships ($p>0.05$).
	Vegetable oil	0.842	
	Margarine	0.027	There was no statistical significance in the differences of consumption frequencies based on memberships ($p\leq0.05$).
	Salt	0.360	There was a statistical significance in the differences of consumption frequencies based on memberships ($p>0.05$).
Prestigious foods	Yoghurt	0.967	
	Ice cream	0.329	
	Jam	0.720	
	Cake	0.101	
	Juice	0.649	
	Biscuits	0.155	
	Popcorn	0.439	
	Potato crisps	0.666	

5.0. CONCLUSION AND RECOMMENDATIONS

5.1. CHALLENGES ENCOUNTERED

i. Not all Lindi community members whom were approached were willing to participate in the research study. Some found it to be burdensome, an invasion of privacy or were just too busy to take part in the interview. This challenge was tackled by approaching community members with a programme volunteer, whom they were familiar with. It was also noted that community members were more willing to participate when reimbursed for their time and energy.

ii. There has been a delay of allocation of project funds from the academic department; this research was therefore funded solely by the researcher.

iii. The University of Nairobi had an indefinite closure during the time of this research study. This delayed the presentation and submission of this report by one month. However, the scheduled activities of the study resumed as soon as campus was opened on 03/05/2016.

5.2. CONCLUSION

The study concluded that there is a relationship between nutritional intake and the use of community currency (CC) in Lindi, Kibera. Non-members of the Lindi-Pesa programme were found to have higher nutritional intake and food frequencies compares to the members. This may be attributed to a number of theories. The Lindi-Pesa Programme aims to economically empower the poorest of the poor in urban informal settlements. Therefore there may be a poverty gap between members and non-members. Additionally, the possibility of Lindi-Pesa members prioritizing more on purchasing non-food items was considered.

5.3. RECOMMENDATIONS

According to the findings of this research study, it is recommended that:

i. There is need to conduct long-term/ periodical monitoring and evaluation of the nutritional intake of community currency users, to have a clearer picture of whether the use of CC improves their dietary patterns. This will generate more information on using the CC programme as a tool for promoting food and nutrition security.

ii. Measures should be taken to promote nutrition awareness and education to safeguard the health and nutrition status of community currency users.

iii. A collaboration of the programme implementers and the Government of Kenya could facilitate the use and advocacy of community currencies across more communities.

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7.0. ANNEXES

ANNEX I: CONSENT FORMS

(ENGLISH VERSION)

NO. _____

CONSENT FORM

Project title: Relationship between community currencies and nutritional intake of households in Kibera Kenya

Name of researcher: Sharlene Mbula Mule

Institution: Department of Food Science, Nutrition and Technology, University of Nairobi.

Objective of the study: To assess the relationship between community currencies and the nutritional intake of households with vulnerable groups in Lindi village, Kibera informal settlement.

This consent form establishes that you have:

- ☐ Confirmed that the researcher has fully explained the study and you have had the opportunity to ask questions for your full comprehension.
- ☐ Understood that taking part in this study is voluntary and that you are free to withdraw from any time, without giving any reason.
- ☐ Understood that any information you give will only be used anonymously and you will not be identified when your views are presented to other participants or in any publications or reports.
- ☐ Agreed to take part in this study in your free will.

Name: _____

Date: _____ Signature _____

Name of researcher: _____

Date: _____ Signature _____

(SWAHILI VERSION)

NO. _____

FOMU YA IDHINI

Kichwa cha mradi: Uhusiano kati ya fedha ya jamii na kiwango cha lishe katika kaya ya Kibera Kenya

Jina la mtafiti: Sharlene Mbula Mule

Shirika: Idara ya Sayansi ya Chakula, Lishe na Teknolojia, Chuo Kikuu cha Nairobi.

Lengo la utafiti: Kutathmini uhusiano kati ya fedha ya jamii na kiwango cha lishe katika kaya ya Lindi, Kibera.

Fomu hii ya idhini inaashiria kuwa:

- ☐ Umethibitisha kwamba umeelezwa utafiti huu kikamilifu na umechukua nafasi ya kuuliza maswali yoyote.
- ☐ Umeelewa kwamba kushiriki katika utafiti huu ni kwa hiari na uko huru kuondoka wakati wowote, bila ya kutoa sababu.
- ☐ Umeelewa kwamba taarifa yoyote utakayotoa itatumika kifiche na hutatambulishwa kwa washiriki wengine, katika machapisho yoyote au ripoti.
- ☐ Umekubali kupokea fidia ya shilingi hamsini (KES. 50/=) kwa muda utakayotumia kuhusika katika utafiti huu.
- ☐ Umekubali kuhusika katika utafiti huu.

Jina: _____

Tarehe: _____ Sahihi _____

Jina la mtafiti: _____

Tarehe: _____ Sahihi _____

ANNEX II: KEY INFORMANT INTERVIEW QUESTION GUIDE

Please ensure that the respondent has signed the attached consent form before beginning this interview.

Section 1: Demographic characteristics

Name _____

Village _____

Occupation _____

Name of interviewer _____

Date of Interview _____

Time: Start _____ End _____

Section 2: Lindi-Pesa community currency programme

a) What is the concept behind Lindi-Pesa programme?

_____
_____
_____
_____

b) What are the objectives of Lindi-Pesa programme?

_____
_____
_____
_____

c) Who is involved in decision-making and implementation in the programme?

_____
_____
_____
_____

d) What social, economic or political factors have affected the running of Lindi-Pesa programme?

_____
_____
_____
_____
_____

e) What goods and services are transacted most by means of Lindi-Pesa?

_____
_____
_____

f) Which other goods and services do you think should have Lindi-Pesa value?

_____
_____

g) How has the use of Lindi-Pesa enabled business vendors to expand the range of goods and services offered?

_____
_____
_____

h) What changes has Lindi-Pesa caused in the community?

_____
_____
_____
_____

i) Which other villages are aware about the Lindi-Pesa programme?

_____
_____

j) Should other villages adopt a similar CC programme? Why do you think so?

_____
_____
_____
_____

Section 3: Food and nutrition security in Kibera informal settlement

a) What is the food and nutrition security status in your village/ Kibera?

_____
_____
_____

b) What are the common foods and food habits in your village/ Kibera?

_____
_____
_____

c) What economic factors affect food and nutrition security in your village/ Kibera?

_____
_____
_____

d) What are the child morbidity and mortality rates in your village/ Kibera?

_____
_____

e) What indicators of malnourishment are present in your village/ Kibera?

_____
_____
_____

f) What has been done to increase food and nutrition security in your village/Kibera?

_____
_____
_____
_____

g) What else do you think should be done to increase food and nutrition security?

_____
_____
_____
_____

ANNEX III: NUTRITIONAL INTAKE ASSESSMENT FORM

Please ensure that the respondent has signed the attached consent form before beginning this assessment.

SECTION A: HOUSEHOLD CHARACTERISTICS

S/No	Q1. Name	Q2. Sex M=1 F=2	Q3. Age (years)	Q4. Relationship to Household Head - RHHH [codes]	Q5. Religion [codes]	Q6. Vulnerable group [codes]	Q7. Occupation [codes]	Q8. Lindi-Pesa [codes]
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

CODES

RHHH	Religion	Vulnerable group	Occupation	Lindi-Pesa
1 = HHH 2 = Spouse 3 = Son 4 = Daughter 5 = Parent 6 = Grandparent 7 = Grandchild 8 = Relative 9 = House help 10 = Other (specify)	1 = Christian 2 = Muslim 3 = Tradition 4 = Others (specify)	1 = Child less than five years old 2 = Adolescent (13-19 years) 3 = Pregnant woman 4 = Lactating woman 5 = Geriatric 6 = Person living with HIV/AIDS 7 = None	1 = Salary earner 2 = Self employed 3 = Casual laborer 4 = Student 5 = Housewife 6 = Unemployed 7 = N/A	1 = Member 2 = Non-member

SECTION B: 24 HOUR DIETARY RECALL

Inquire and record all foods consumed in the household during the past 24 hours by any member of the household. Note that composite dishes should be broken down into their ingredients. The respondent should be the person who prepared the meal the previous day.

Time	Name of meal, snack or drink	Method of cooking	Ingredients	Amount of ingredients	Serving size
Q9. Before breakfast					
Q10. Breakfast					
Q11. Mid-morning					
Q12. Lunch					
Q13. Mid-evening					
Q14. Supper					
Q15. After supper					

The following symbols should aid in estimating portion sizes during the 24 hour dietary recall.

Hand Symbol	Equivalent	Foods	Calories	Servings
	**Fist** 1 cup	Rice, pasta Fruit	200 75	3 - 4x/day 2 - 3x/day
	**Two Fists** 2 cups	Veggies	40	2 - 3x/day
	**Palm** 3 ounces	Meat Fish Poultry	160 160 160	1 - 2x/day 1 - 2x/day 1 - 2x/day
	**Handful** 1 ounce	Nuts Raisins	170 85	2 - 3x/day 2 - 3x/day
	**2 Handfuls** 2 ounces	Chips Popcorn Pretzels	150 120 100	<1x/week <1x/week <1x/week
	**Thumb** 1 ounce	Peanut butter Hard cheese	170 100	2 - 3x/day 2 - 3x/day
	**Thumb tip** 1 teaspoon	Cooking oil Mayo, butter Sugar	40 35 15	3 - 4x/day 1 - 2x/day 1 - 2x/day

Courtesy of *www.prevention.com*

SECTION C: HOUSEHOLD DIETARY DIVERSITY SCORE

Inquire and record the food groups consumed in the past 24 hours by any member of the household and their means of procurement. The respondent should be the person who prepared the meal the previous day.

No.	Food Group	Food item	YES=1 NO=0	Primary means of food procurement
Q16.	High-fiber starches	Ground flour, whole-meal bread, brown rice, arrow root *(nduma)*, sweet potato *(ngwaci)* and plantains *(matoke)*.		
Q17.	Organ meats	Liver, kidney, heart, gizzard and lung.		
Q18.	Meat and fish	Beef, goat, pork, chicken and fish.		
Q19.	Eggs	Chicken eggs		
Q20.	Milk and milk products	Whole milk, infant formula, yoghurt and ice cream.		
Q21.	Fortified foods	Maize flour, sugar, vegetable oils, margarine and salt		
Q22.	Sweets, desserts and other snacks	Jam, cake, juices, biscuits, popcorn and potato crisps.		
Q23.	Foods prepared outside but consumed inside the home yesterday?			

Primary means of food procurement	1= Own production 2= Purchased with national currency only (Kshs). 3= Purchased with community currency only. 4= Purchased with national and community currency. 5= Other or N/A
Total Score *(total number of food groups consumed in the household)*	

SECTION D: SIMPLE FOOD FREQUENCY QUESTIONNAIRE

Inquire the average number of times the household members consume the food items listed below.

No.	Food items	Frequency of consumption
Q24. High-fiber starches		
a)	Ground flour *(Ugali, chapati)*	
b)	Whole-meal bread	
c)	Brown rice	
d)	Arrow root *(nduma)*	
e)	Sweet potato *(ngwaci)*	
f)	Plantains *(matoke)*	
Q25. Organ meats		
a)	Liver	
b)	Kidney	
c)	Heart	
d)	Gizzard	
e)	Lung	
Q26. Meat, fish and eggs		
a)	Beef	
b)	Goat	
c)	Pork	
d)	Chicken	
e)	Fish	
Q27. Eggs		
a)	Chicken eggs	

Frequency of consumption	Code
Never	A
1-3 per month	B
Once a week	C
2-4 per week	D
5-6 per week	E
Once a day	F
2-3 per day	G
4-5 per day	H

No.	Food items	Frequency of consumption
Q28. Milk and milk products		
a)	Whole milk	
b)	Infant formula	
c)	Yoghurt	
d)	Ice cream	
Q29. Fortified foods		
a)	Flour (maize, wheat)	
b)	Sugar	
c)	Vegetable oils	
d)	Margarine	
e)	Salt	
Q30. Sweets, desserts and other snacks		
a)	Jam	
b)	Cake	
c)	Juices	
d)	Biscuits	
e)	Popcorn	
f)	Potato crisps	

Frequency of consumption	Code
Never	A
1-3 per month	B
Once a week	C
2-4 per week	D
5-6 per week	E
Once a day	F
2-3 per day	G
4-5 per day	H