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Women Tackling Malnutrition Through Alternative Farming: A Case of "Tule Vyema" Community-Based Organization in Kiserian

Lenity K. Kathenya (Corresponding author)

University of Nairobi, Kenya

E-mail: lenitykk@gmail.com

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Abstract

Urban areas worldwide have experienced a surge in population growth in recent times. The rapid increase in the urban population brings about many challenges to food security. With the increase in urban poverty, there is a renewed interest in looking at alternative strategies for improving urban livelihoods. Urban food insecurity is an emerging challenge exacerbated by climate change, low income, and limited access to land. In many developing countries, the growing urbanization brings about poverty, food insecurity, malnutrition, and other challenges. Many children in Kenya are severely malnourished and risk dying from drought-related hunger (Quintana, D. and H. Wenban-Smith, (2020). Pregnant and nursing mothers across Kenya may suffer from malnutrition thus adversely affecting their children's health. Alternative farming in urban areas represents an avenue for increasing food supply, bettering health conditions and providing a source of income. This paper explored the use of alternative farming to address malnutrition. The study adopted a cross-sectional design and utilized qualitative data collection methods and analysis. The target population comprised women who are beneficiaries of the CBO. Purposive sampling was used to select 15 women who were interviewed. Data were analyzed by thematic analysis. The findings demonstrated improved diet intake, food security, knowledge in nutrition, reduced household malnutrition, improved health in adults and children, and economically empowered women.

Keywords: food security, indigenous vegetables, malnutrition, nutrition, Sack Farming, nutrition education

1. Introduction

The urban population worldwide has rapidly grown at a rate not witnessed before. In 2014, the urban population accounted for over half of the world's population (Chapagain, T., et al., 2019). The high rate of urbanization in many developing countries is taking place when the availability of non-farm jobs is a challenge (Chihambakwe, M., P. Mafongoya, and O. Jiri, 2019). (Dominguez-Salas, P., et al., 2016). Natural population growth, rural-urban migration, and the elevation of rural areas to urban centers are responsible for the rapid expansion of urbanization. However, this may not be directly related to the increase in urban poverty. Rather, it points to the massive failure of political institutions to provide basic infrastructure, housing, and other amenities in the urban area. This accounts for the inequality witnessed among the urban populations.

Urban populations experience poverty, food insecurity, and malnutrition as a result of the rapid increase in their numbers. These are marked by chronic undernutrition and micronutrient deficiencies evident among childbearing mothers and older women; thus, the burden of malnutrition has shifted from rural to urban areas. Indeed, one-third of the stunted children are found in urban areas. (Dumont, A.M., P. Gasselin, and P.V. Baret., 2020). Food is a great challenge to the urban poor who, despite their limited access to cash, must buy food for their households.

In many developing countries, indigent urban households expend more than half of their budget on food, even though their income from the informal sector jobs cannot cope with the rising needs of their families. The dependence, especially by women, on bought food and informal employment increases their susceptibility to income and food price fluctuations. Unlike in rural areas, food-insecurity problems in urban areas are not related to a lack of available food but are due to inadequate purchasing power (Edwards, M., 2018).

In 2019, UN agencies estimated that more than 2 billion people would not have regular access to safe, nutritious, and sufficient food. More than 820 million would face chronic food deprivation, According to Elemike, E.E., et al., (2019), FAO reported that about 870 million people were estimated to have been undernourished (dietary energy supply) between 2010 – 2012. This figure represents 12.5 percent of the global population or one in eight people. The vast majority of these, 852 million, live in developing countries, where undernourishment prevalence was estimated at 14.9 percent of the population.

Like most developing countries, Kenya is experiencing rapid urbanization and continues to record a rise in the percentage of the population living below the poverty line. Urban poverty has affected almost half of Kenya's urban population and continues to rise. Currently, the projection points to half of the Kenyan poor population being urban poor by 2020 (Griffiths, M., 2019). More than half of Kenya's total food poor live in slums and other low-income dwelling environments, where the poorest urban dwellers spend up to three-quarters of their total income on food (Juraschek, M., et al., 2018). The high population densities, rising prices of food and other necessities, and weaker social support networks all contribute to the vulnerability of the poor urban population in Kenya (Khumalo, N.Z. and M. Sibanda, 2019).

1.1 Alternative Farming for Food Security in Urban Areas

Alternative farming is defined as production systems that do not use conventional methods (Kopittke, P.M., et al., 2019). They aim at following the concept of agroecology. These systems seek sustainable performances while optimizing all agroecosystem resources (Lu, I., et al., 2021). The growing threat of an urban food crisis can no longer be ignored. Developing countries can help ensure that food systems provide healthy diets in urban settings. Undernutrition, over-nutrition, and micronutrient deficiencies are simultaneously present in cities in low- and middle-income countries. One survey of low-income households in Nairobi in 2013 - 2014 showed that 41.5% of children were stunted and 74% were anemic, while 29% of women were overweight and nearly 26% were anemic (Miassi, Y., F. Dossa, and K. Banzou, 2018).

If countries wish to conclusively address the increase in poverty, they need to make policies that will strengthen the strategies made by the urban poor to survive. Urban farming is one livelihood strategy used by the urban poor to improve their well-being. Several studies from urban and peri-urban farming worldwide have shown that it effectively improves household food security.

Numerous studies of urban and peri-urban farming worldwide have demonstrated that it effectively improves household food security (Michailidis, D.L. and D. Lazaridou, 2020, Moorthy, D., et al., 2020, Ndunge, G., et al., 2020). Peri-urban farming is also practical as an income-generating activity (Ndunge, G., et al., 2018). Studies of urban farming in sub-Saharan Africa indicate that one out of three households practices some form of urban agriculture and that two out of three farmers are women (Nichols, C., H. Kampman, and M. van den Bold, 2021).

Traditional agriculture does not guarantee constant food security for the growing population, and also it has adverse effects on the ecosystem. Therefore, food production should be further explored using alternative methods. As one of the solutions, urban space

should be reconsidered to exploit more space for plant cultivation and food production to improve food security (Nigussie, S., L. Liu, and K. Yeshitela, 2021).

2. Methodology

This study was carried out in Kiserian, a town in Kajiado County, in the Rift Valley region of Kenya. It is about 22 kilometers South of Nairobi, the capital city of Kenya. The inhabitants of the town are the Maasai who are mainly pastoralists.

The study adopted a cross-sectional design and utilized qualitative data collection methods and analysis. Fifteen women farmers of childbearing age were involved in the study. Such women were purposively sampled and were direct beneficiaries of the "Tule Vyema " project and were responsible for preparing food in their households. Secondary data and information were also sourced from multiple sources to complement the findings of the study.

Data were analyzed using qualitative methods entailing thematic analysis as assisted by the NVIVO software for qualitative data analysis.

3. Results

3.1 Formation and Objective of "Tule Vyema" Community-Based Organization

"Tule Vyema" is a Swahili phrase that means 'Let's Eat Right. It is a Small Community Based Organization founded on the realization that indigenous vegetables were little known and were rarely consumed despite their rich nutritional value. The project aims to equip the community members with nutritional knowledge and improve their quality of life through proper nutrition and food security. Kajiado County is one of the counties in Kenya that is hard hit by changing environmental conditions and limited access to food. Families had insufficient or no food and relied on food assistance programs, local NGOs, and churches. As a survival mechanism, mothers often had to make tough choices to share scarce food, going without food in favour of the younger children. The following is an explanation from the founder:

> *The name of this organization stems from the need to eat well and thus "Let's Eat Right". I realized most people living in Kajiado County were faced with starvation and malnutrition. So, this organization was formed to bridge the gap by encouraging alternative farming and developing the capacity of others to ensure proper nutrition for their children.*

The study also established that the region is often faced with malnutrition. According to Nutrition International (2020), one in four children in Kajiado is affected by acute malnutrition, while 44% of women and girls are overweight, much higher than the national average. During the interview with the organization's founder, it emerged that malnutrition was a severe challenge in the region.

> *There was a surge in malnutrition, diseases and conflict over food. We formed this organization because we saw women and children hard hit by malnutrition. We realized that women did not appreciate eating nutrient-rich food because they only thought of buying maize flour, rice, and cabbage, which was their everyday meal.*

According to a study conducted by Ndunge, G., et al., (2020), nearly 73,000 children in Kenya were severely malnourished and at risk of dying from drought-related hunger. The survey also revealed that almost 40,000 pregnant and nursing women across Kenya were malnourished, a 20% increase from 2016, leaving them and their children's health in a precarious position, says. There was thus a need to address the malnutrition challenge faced by society in this perspective.

The interview also revealed that the organization was conceptualized from the realization that indigenous vegetables did well in the study area.

> *I started by planting indigenous vegetables for use by my family, and they did very well and realized that this could work. I began with my local church, where I taught women proper nutrition by eating the right diet and deworming children up to 12 years. Due to a lack of land and space, we planted indigenous vegetables in sacks, also known as vertical gardening. This type of vegetable is very nutritious but too expensive for poor urban women to buy. Today, the organization has over 800 households doing this*

> *farming and over 3000 families who have received nutrition education.*

The organization targets women and children.

> *We target women because, in the African context, a woman is in charge of the kitchen; she is the one who prepares food for her family. When equipped with knowledge of the best feeding practices and how to farm her food, she will apply this in her house, and also, considering the talkative nature of a woman, she will share the knowledge acquired with her friends.*

The organization also targets children aged 12 and below.

> *We work with children up to age 12 whom we deworm because, at this age, they are yet to fully appreciate the importance of hand washing and proper sanitation, a fact that has a negative impact on the nutrition status if not fully observed.*

3.2 Activities of Tule Vyema Community Based Organization

3.2.1 Nutrition Education

The project held health talks with the enrolled members of the community. The talks are aimed at raising awareness of proper nutrition. The focus of the talk is to provide women with adequate knowledge on nutrition and how nutrition impacts the health of family members, especially children.

> *We conduct educational talks on nutrition and health for women and caretakers at the Good Samaritan Church in my community. The organization raises awareness of proper nutrition practices in communities to reduce incidences of malnutrition. We focus on women for they are in charge of the kitchen (part of the inherited package of gender roles) and share with them some information on highly nutritious foods and proper feeding practices. Once they begin to appreciate the importance of a healthy meal, they put into action what they learn at the household level.*

Such talks were deemed beneficial to the participants. They gained knowledge on diet and nutrition-associated diseases. One of the informants indicated:

> *Through the health talks, we have acquired a lot of knowledge on eating a proper diet and its benefits to our health which we didn't have before. We now know how to prepare and eat a well-balanced diet. Our children have fewer stomach illnesses and no intestinal worms because of frequent deworming. We can better manage our health conditions. Our families are now healthier and happier because we know eating well prevents more people from taking medication. We can manage diseases such as cancer, diabetes, and blood pressure by eating indigenous vegetables and using the knowledge from nutrition education talks. Indigenous vegetables are known to come with a lot of benefits to the health of a person. From the health and nutrition talks we have with "Tule Vyema," we have known that indigenous vegetables are nutrient-dense with iron, fiber, magnesium, and other nutrients. These nutrients are very important to women of all ages because of their constant loss of blood through childbirth and menstruation. They replenish the blood and prevent anemia. Women can give birth to healthy babies*

with less bone and tooth deformity as breast milk is quite nutritious.

3.3 Sack Farming as Alternative Farming

The participants engage in alternative farming by planting indigenous vegetables in sacks. The indigenous vegetables are believed to be very nutritious. This is considered to supplement common foods consumed and, at the same time, cushions women from economic vulnerabilities through the sale of surplus vegetables.

> *"Tule Vyema" works with women of reproductive age to end malnutrition using sack farming. Indigenous vegetables are rich in nutrients such as vitamins A, C, and Iron. These are protective nutrients that build immunity which is important in preventing diseases. The indigenous vegetables are also rich in Iron, a nutrient of concern among women of reproductive age. Eating these vegetables helps boost blood production and thus protects women from anemia. The members also cultivate the indigenous vegetables since they have a short maturation period and are resistant to pests and diseases. Women learn to grow indigenous crops to boost their families' food security and sell the surplus to earn their income. Sack farming, also known as "bag gardening" is a sustainable, inexpensive, and effective way of tackling the double burden of poverty and malnutrition. It uses ordinary scrap sacks as the foundation for producing crops, such as traditional or indigenous vegetables. We run a series of workshops on the sack farming project with young and unemployed women of reproductive age, all heads of families who live off $1 per day. Each woman is provided with four sacks to grow four different indigenous vegetables: spider plant, amaranthus, cowpeas, and African nightshade.*

The organization also works with the County Government of Kajiado for technical assistance.

> *In many cases, we work with County Agricultural Officers who have the technical know-how to teach the women the right seeds to plant, the spacing, and how to take care of their plants. The County also helps recommend women who will take part in the project.*

Mothers enrolled in the program are mentored for about six months before they are allowed to work independently. This training period ensures that they understand the process and continue farming.

> *We work with the women farmers for about six months to ensure that by the time they are done with the project cycle, women are properly equipped with nutrition knowledge, and the know-how to take care of their sack farms, and have even started eating and selling the surplus. From there, they are left to work on their own but we make a continuous follow-up to monitor the progress, and once the progress is good, we reduce the interaction and encourage them to share the knowledge and skills acquired with other women.*

From the key informants and the project beneficiaries, it emerged that sack farming was very convenient. The beneficiaries also affirmed that they were able to make savings from sack

farming and thus get an economic boost for them. One of the informants indicated the following:

> *Sack farming enables us to plant our vegetables instead of buying them. Buying indigenous vegetables is costly, and only very few households can afford them. Instead, they would buy cabbage and kales, which are much cheaper. Sack farming is very convenient because we can do it in our very small compounds and on the house verandahs by standing one or more sacks depending on the size of the verandah and the compound. Now more than before, we can afford to eat indigenous vegetables in our every meal. Sack farming is not labor-intensive since it has minimal weeding and watering time, which can be done very early in the morning or the evening, leaving the farmer with the rest of the day to attend to her daily chores. Even our children do help in watering the plants. There is minimal use of water because sometimes we recycle water that has been used to rinse the utensils to water the plants. We have become economically empowered because we sell to the neighbors for their consumption while others buy to take to the market. We can earn some money that helps sustain our family needs and afford contributions for our "chamas".*

The participants also acknowledged that sack farming was economically beneficial and that it contributed to food security.

> *With sack farming, we contribute to food security in the country because we have a constant supply of indigenous vegetables to feed our families. We sell the surplus to the neighbor's households at a cheaper rate than the market, enabling them to have nutritious food on the table and the other women who go to sell to the market.*

Socially, sack farming was described by the participants as a uniting factor since participants could socialize with others as they transact. One of the informants shared the following views:

> *Sack gardening has helped to create a sense of community because it has given people reasons to talk with their neighbors.*

Thirty-two percent of farmers reported that they now consult about problems and create employment for each other. Sack farming has been a way to bring the women of certain neighborhoods together.

3.4 Deworming of Children Under 12 Years Old

According to Requena, Mart ńez-Cuesta (2018), worms can cause malnutrition in children since once worms enter the human body, they find their way into the intestines, where they absorb all the nutrients and energy that the person assimilates. As a result, the individual often develops anemia and is often undernourished. The organization fights malnutrition occasioned by such factors and carries out deworming for children under 12 years.

According to the founder, "Tule Vyema" also holds regular deworming drives to eliminate parasitic worms in children. Since 2017, "Tule Vyema" has helped over 400 households become more food-secure and has dewormed more than 1,200 children.

We work with the county hospitals where we refer malnourished children we come across during the nutrition and health talks, for further management with therapeutic or supplementary feeds. The county government officers also help us identify project participants.

4. Discussion

4.1 Nutrition Education

The study established that the organization conducts nutrition and health talks with its beneficiaries. Such discussions are aimed at imparting nutritional knowledge to the beneficiaries. This, in turn, is deemed to be influential in making health-conscious decisions and motivating to participate in the project. The participants acknowledged such talks as beneficial. According to Griffiths, M. (2019), The process of nutrition aims at changing people's beliefs, attitudes and influences, to foster better nutritional practices for healthier lives within the available resources. The benefits of nutrition accrue through the consumption of adequate and highly nutritive food which helps boost immunity, and reduce malnutrition and communicable diseases; thus lessening incidents of hospitalization (Onyango, E.O., J. Crush, and S. Owuor, 2018). The findings of this study, therefore, provide a strong case for nutrition education as community members indicated improved nutritional practices for healthy living.

4.1.1 Sack Farming as Alternative Farming

The study established that alternative farming achieved through sack farming was the best alternative for the community members who participate in alternative farming by planting indigenous vegetables in sacks. The benefits of sack farming, according to the study, include the convenience of recycling water used for domestic purposes, the use of limited space and the comfort of access. Similar findings have been recorded by Elemike, E.E., et al., (2019) that the sack method allows a freer flow of water to the roots and retains moisture more efficiently than traditional methods. This implies that sack farmers can keep their plants hydrated with less water. Further, Xie, J., et al., (2018) posits that sacks allow people to grow food in places with limited access to arable land and water. On the other hand, Dumont, A.M., P. Gasselin, and P.V. Baret, (2020) explain that one of the advantages of this method is its portability and high productivity at a low cost.

From the study findings, the planting of indigenous vegetables was deemed beneficial since indigenous vegetables were considered highly nutritious and matured faster. Some of the indigenous vegetables consumed in Kenya include amaranths (*Amaranthus species*), spider plant (*Cleome gynandra*), African vegetable nightshades (*Solanum species*), cowpeas (*Vigna unguiculata*), African eggplant (*Solanum aethiopicum*), African kale (*Brassica carinata*), Nightshade (*Managu*), Vine spinach (*Nderma*), Spider plant (*Sagaa*) and Jute mallow (*Corchorus olitorius*). Such vegetables have high nutritional value. They contain high levels of minerals, especially calcium, iron, and phosphorus. They also contain significant amounts of vitamins and proteins. Iron is essential for body development. For young mothers, it enhances milk production Silva-Laya, M., et al., (2020).

Sack farming also comes with socioeconomic benefits. Economically, surplus vegetables are sold locally in the neighborhood. The study established that the scarcity of such vegetables and the growing demand for them, make them expensive and thus a better return. Savings made from the sale of vegetables could also enhance livelihood. Miassi, Y., F. Dossa, and Banzou, K., (2018) conducted a similar study that also detailed how to sack farming is economically sound, especially for the urban poor. The study established that socially, sack farming and the activities surrounding sale and nutrition education created social bonding among the community members. A study conducted by Lu, I et al., (2021) also detailed the unintended social benefits of community agricultural projects. Therefore, it can be understood that the project also stirred up activities leading to better social bonds in the community.

4.1.2 Deworming of Children Under 12 Years Old

The study further established that deworming for children under the age of 12 years was conducted to enhance the nutrition initiative of the project. As such, beneficiaries of the project were encouraged to deworm their children under the age of 12 regularly. This practice has also been documented by Sarma, H., et al., (2021), and Moorthy, D., Merrill, R., (2020) studies where nutritional interventions worked best when complemented by the practice of regular deworming. This finding, therefore, leads to the understanding that frequent deworming complements the nutritional intervention as implemented by the project.

5. Conclusion and Recommendations

This study examined the use of alternative farming in tackling the challenge of malnutrition by a community-based organization. The study established various activities organized by the community-based organization to tackle malnutrition. Such include health and nutrition talks, sack farming, and deworming of children under 12 years. The study established that the planting of indigenous vegetables helped tackle the problem of malnutrition. Sack farming was also perceived as the best alternative farming method given frequent droughts in the area, convenience, and affordability. Sack farming also contributed to the socio-economic well-being of the participants. Such indigenous vegetables were perceived to be nutritious for children and women alike. Socially, sack farming enabled the participants to utilize their social networks and thus develop a socially vibrant society.

5.1 Recommendations

Since water is a great challenge in Kajiado County, the County Government could facilitate innovative methods of harvesting rainwater in households so that sack farmers can continue with agricultural practices even during the dry seasons. Sack farming holds high prospects for success when the objective is to enhance household indigenous vegetable consumption and to generate supplementary income for women, whereas the Kiserian case study stands the chance of improving the lives of households through proper diet, nutrition, and income. Kenya would do a lot better if sack farming is introduced to the large towns and the rural areas in the country. However, a study of indigenous sack farming women would be an interesting area for future research to better understand their role in nutrition and food security and explore options to empower them in indigenous vegetable farming and the value chains.

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