ajfand SCHOLARLY, PEER REVIEWED
AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT
Volume 21 No. 1 January 2021
PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST
ISSN 1684 5374

Afr. J. Food Agric. Nutr. Dev. 2021; 21(1): 17272-17289 https://doi.org/10.18697/ajfand.96.20125

THE PROMISE AND CHALLENGES OF VEGETABLE HOME GARDENING FOR IMPROVING NUTRITION AND HOUSEHOLD WELFARE: NEW EVIDENCE FROM KASESE DISTRICT, UGANDA

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ABSTRACT

Nearly eighty percent of Kasese District residents in Western Uganda pursue subsistence farming on the slopes of the Rwenzori Mountains where soil erosion and poverty contribute to declining agricultural yields, food insecurity, and high rates of stunting and wasting in children. In 2017, the Rwenzori Center for Research and Advocacy (RCRA) began a pilot home garden program aimed at sustainably improving nutrition for vulnerable households in Kasese. In 2019, the research team investigated whether a home garden intervention for nutritional benefit is an effective entry point to achieve broad household welfare. Data were collected from fifty randomly selected households in four sites with varied degrees of exposure to the garden intervention. Methods included a questionnaire, innovative card sorting game (CSG), 24-hour recall nutrition survey, in-depth interviews, and case stories of diverse Kasese women. Findings show that households experience diverse garden benefits and challenges depending upon baseline conditions, such as access to land, water, and money, as well as the quality and consistency of the technical and material support received. The frequency of vegetable consumption per day showed the most consistently positive results across households, while a 24-hour nutrition survey displayed increased consumption of leafy green vegetables high in iron and vitamin A among families with gardens, leading to 'stronger children' (CSG scenario) and improved family health. Further, over seventy percent of families generated income from their gardens, though varying widely in capacity to sell year-round. The garden income earned by women gardeners is spent almost entirely on child welfare. On average, more than ninety percent of garden households save ten percent of their income, primarily through Village Savings Groups. Therefore, regarding our research question, there is evidence to affirm that a home garden intervention for nutritional benefit can be an effective entry point to achieve broad household welfare. This conclusion is supported by numerous previous studies on garden initiatives for improved nutrition around the world.

Key words: Home gardens, dietary diversity, vegetable gardens, Uganda nutrition gardens

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INTRODUCTION

This story begins with Rukundo, a resident of Maliba, a village in Kasese District of Southwestern Uganda.[1] A mother of seven, Rukundo had her first child when she was seventeen and has struggled financially to provide for her children with the little income their family generates from subsistence farming in the depleted hills of the Rwenzori mountains. In 2017, after the non-profit organization Rwenzori Center for Research and Advocacy (RCRA)[2], launched a pilot program on home gardening for better nutrition and family welfare in Maliba, Rukundo was able to develop a substantial vegetable garden on her property. From this garden, she harvests a diversity of crops including dodo/spinach (*Spinacia oleracea*), cabbage (*Brassica oleracea var. capitata*) and eggplant (*Solanum melongena*) for her family to eat and a surplus to sell. Now, with the income from her garden, she is able to buy goats and hens and pay her children's school fees. In an interview, she explained "*the good life that I am in is because of home gardening.*" Rukundo and her children are only one example of a household that is able to profit from the variety of benefits of home gardens.

This research explores whether support for home gardening is an effective entry point for improving family nutrition and welfare, and adds new evidence to a substantial literature on the benefits of home gardens. Home gardening is an ancient practice of growing common foods near to the residence for easy access throughout the day (for example, herbs, leafy and root vegetables, fruits, medicinal plants, and limited quantities of grains, and, for some, includes bees, fish and small livestock) [1, 2, 3, 4, 5]. Home gardens throughout the world, notably in South and Southeast Asia, are highly genetically diverse and contribute to *in situ* agrobiodiversity conservation [5]. While there is evidence that traditional cultural knowledge of gardening is being lost over time [6, 7], there have been many grassroot initiatives by nutrition and food security-focused organizations to build back that knowledge and introduce 'improved' gardening in poor rural, semi-urban and urban communities [8, 9]. Helen Keller International has worked specifically to promote vitamin A-rich gardens for prevention of nutritional blindness and currently promotes an expanded Enhanced Homestead Food Production program to "increase year-round availability and intake of diverse micronutrient-rich foods" [10, 11]. The World Food Program has supported home and school gardening as part of a larger strategy to build community resilience to climate change and to mitigate hunger from crop losses due to desertification and drought [12]. In sub-Saharan Africa, the Food and Agriculture Organization (FAO) has promoted low input gardening projects in communities with high incidence of HIV-AIDS and numbers of Orphan and Vulnerable Children (OVC) to reduce malnutrition [13].

Home gardens are particularly compelling due to the multiple benefits they provide for families at relatively low cost. Different types of gardens may have some or all of the following benefits: 1) mitigate hunger during the agricultural lean season or in cases of

[1] Names have been changed to preserve participants' privacy

[2] The Rwenzori Center for Research and Advocacy is a non-profit organization founded in 2010 with the mission to support vulnerable children and families in Kasese district primarily through health interventions such as reproductive maternal, neonatal and child health, family planning, nutrition, malaria prevention, HIV/AIDS awareness, care and support to persons infected and affected

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major crop losses, 2) improve year-round dietary diversity, 3) reduce micronutrient deficiencies, especially iron and vitamin A, 4) generate income to purchase food and other basic needs, 5) enable savings to be invested in household priorities such as school fees and home improvement, 6) provide a livelihood for vulnerable populations, such as grandmothers and those living with HIV-AIDS, 7) put food and income in the hands of women and their priority focus on child welfare, 8) provide a 'testing ground' to experiment with new plants and practices for possible scaling-up on farms, and 9) *in situ* conservation of plant biodiversity [1, 2, 6, 8, 9].

In Kasese, Uganda where political conflict, ethnic and socio-economic marginalization, and degraded natural resources contribute to widespread and persistent poverty, home vegetable gardens can be a relatively low-cost and sustainable intervention to support nutrition and health.

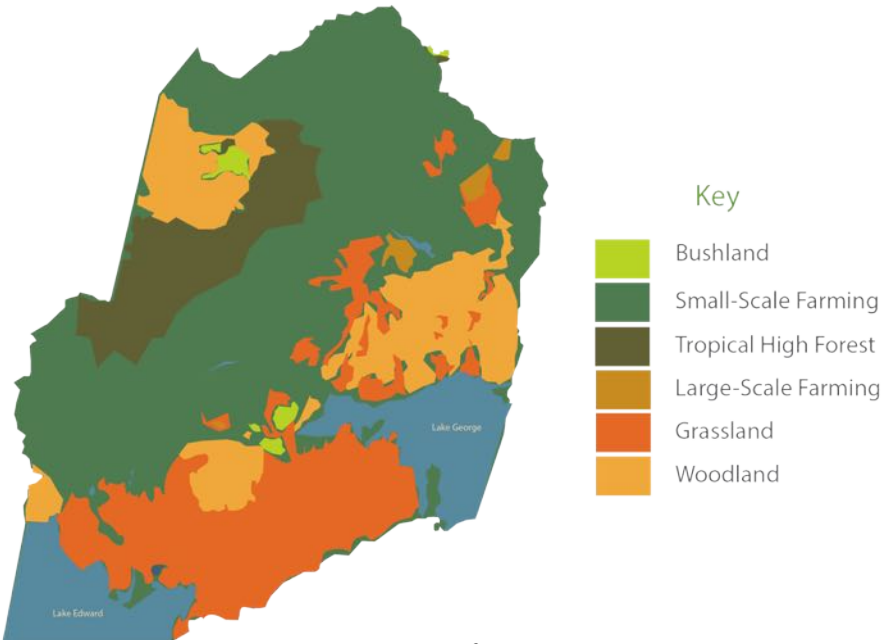

Figure 1: Kasese District Land Use Map[3]

Kasese is a mountainous district, where national parks and public land occupy sixty-three percent of the land area, providing great potential for ecotourism. As of yet, few income generating activities exist for local residents (Figure 1). Primarily agriculturalists, seventy six percent of the population farm subsistence crops including matooke, cassava, maize, sweet potatoes, millet, sorghum, beans and groundnuts [14]. A high population growth rate of two-and-a-half percent, in addition to the recent influx and permanent settlements of refugees from the conflict in the Democratic Republic of Congo (DRC), has exacerbated pressures on the environment [15]. Soil erosion has led to degradation of the watershed and lower agricultural yields.

[3] Kasese District Local Government, Land Management Division, Physical Planner Section, March 18, 2020

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Despite the increasing number of farmers and agricultural plots in Kasese, aggregate food production per-annum has decreased consistently over the last five years, making food insecurity one of the key challenges facing the district today [16]. Fifty-five percent of households are classified as 'moderately to extremely poor'. Over forty percent of Kasese children aged 5-59 months-old are stunted and thirteen percent are wasted, compared to national statistics of twenty-nine and four percent, respectively [17, 18]. Figure 2 shows several key statistics where Kasese falls behind Uganda as a nation in population and health.

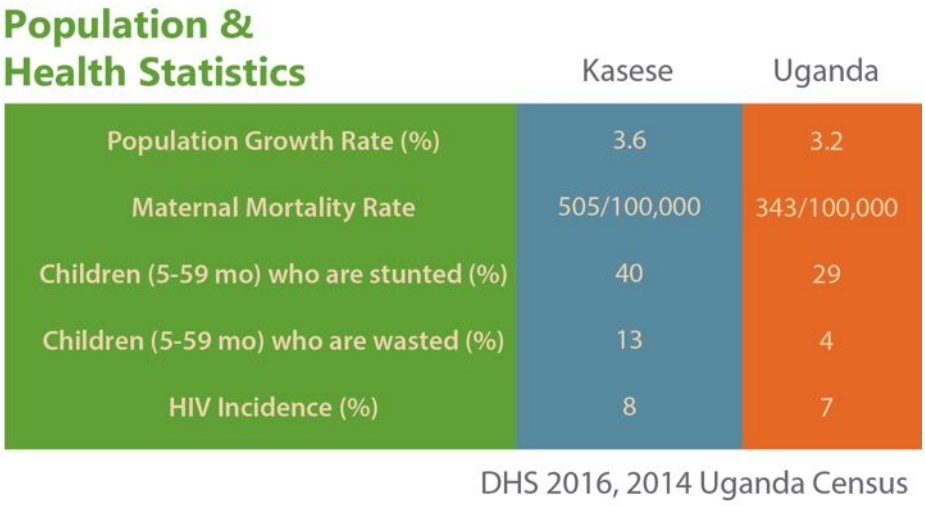

Figure 2: Kasese Population and Health Statistics

To address these interrelated conditions, RCRA received a small grant in 2017 to design and implement a pilot Population, Health and Environment (PHE) project.[4] Given widespread problems with food access and poor nutrition in the region, particularly among the populations RCRA serves (People Living with HIV-AIDS - PHA, OVC), the organization decided that vegetable home gardens would be the 'entry point' for a PHE project that eventually would include components such as improved latrines, energy efficient stoves, tree nurseries, and small income-generating enterprises, in addition to maternal and child health services and family planning. With limited funds, RCRA chose to pilot the garden project with fifty households in the rural sub-county, Maliba, and small trading towns of Mubuku and Hima. Gardening support included provision of vegetable seeds and one RCRA staff and local 'para' social worker volunteers to provide training on organic gardening practices. The hope was to achieve a larger number of indirect beneficiaries through a multiplier model of demonstration and replication. It is within this context that RCRA partnered with the University of California (UC), Berkeley and the local university, Mountains of the Moon (MMU), to help evaluate the effectiveness of the pilot home garden project with respect to the primary goal of addressing poor nutrition and the wider goal of improving family welfare.

[4] PHE is an integrated community-based human welfare approach that incorporates reproductive health, natural resource management and livelihood components and supports behavior change through improved understanding of the linkages among these components

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MATERIALS AND METHODS

This study was designed to investigate the question: Is a garden intervention for nutritional benefit an effective entry point to achieve broad household welfare? Field work was conducted in 2019 by two MMU student researchers fluent in the local language, Rukonzo, and a UC Berkeley student earning his Masters in Development Practice, supervised by their respective faculty advisors.

Research sites

Research was carried out in **four** sites within the coverage area of RCRA that received varied types and levels of support on nutrition, home gardening, and health information and services. Figure 3 summarizes basic demographic information across the four research sites.

Demographics	Hima n=6	Kyabarungira n=19	Maliba n=20	Mubuku n=5
Female Head Age	40 (6.9)	43 (12.2)	42 (11.9)	62 (11.6)
Family Size (M, Range)	5.2 (4)	6.5 (12)	6.7 (9)	8.2 (8)
Marital Status				
Married/Living Together (%)	50	31	20	80
Divorced/Separated/ Widowed/Never Married (%)	50	69	80	20
Has Garden (%)	83	21	100	100
Land Ownership (%)	20	58	90	100

Figure 3: Demographic Table of Study Population

Farming families in the small rural village, **Maliba**, were introduced to RCRA's pilot PHE project as 'model households' in 2017, with vegetable home gardening as the entry point to tackle critical issues of hunger and poor nutrition. Selected households received seeds and technical assistance to help set up gardens and occasional monitoring to solve gardening problems. Maliba also received support from the suite of RCRA health interventions: reproductive health, HIV-AIDS drug adherence support, TB testing, and mobile clinics, as well as Village Savings Groups (VSG). Twenty households were randomly selected from a total of thirty-five PHE model households.

Mubuku is a small trading town near Maliba with a market, small shops and a mixed population with and without land for farming. The PHE project did not extend to Mubuku; however, RCRA provided support for a few vegetable gardens on very small plots. All other RCRA interventions are present in Mubuku. Five Mubuku households were randomly selected from a list of those receiving RCRA garden support.

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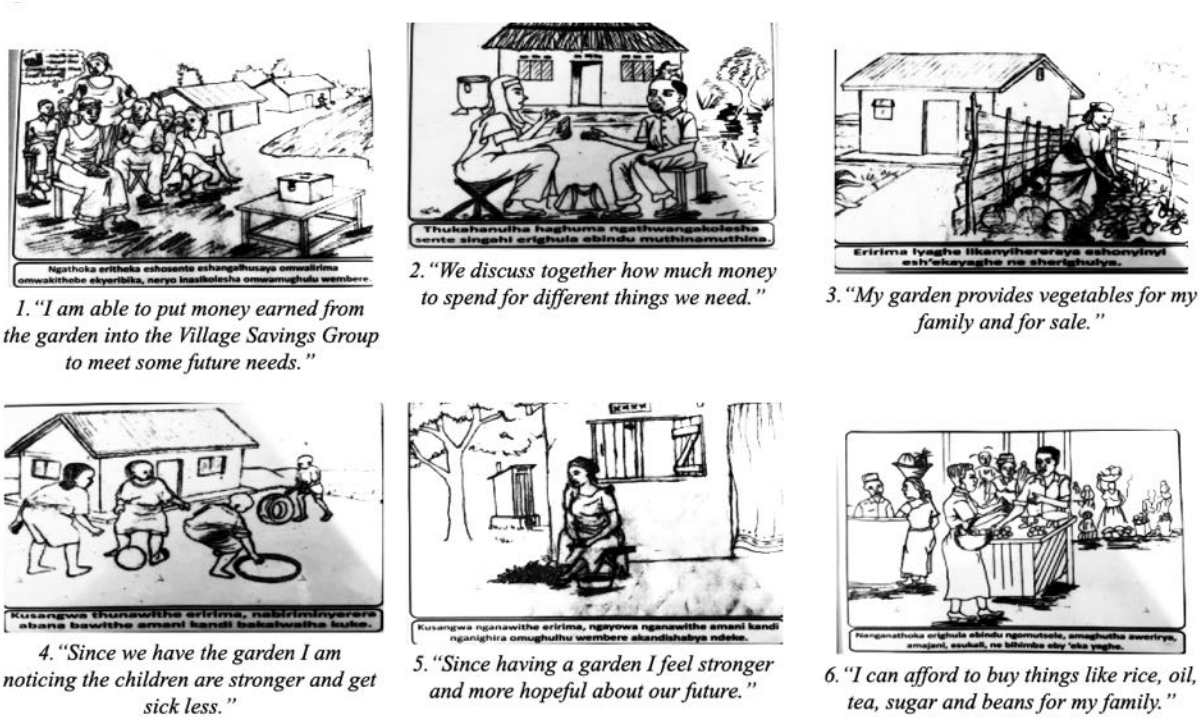
Hima is a small trading town on the main road north from Kasese, the capital city, known for its large cement factory, more transient population, and high rate of HIV-AIDS. RCRA has supported a small number of Hima households with kitchen gardens and VSG, in addition to all of the health interventions. Six households were randomly selected from a list of fifteen who received garden support.

The final site, **Kyabarungira**, is a remote sub-county of small-scale farming communities. This area received no gardening intervention from RCRA and serves as a point of comparison with rural Maliba regarding our main research question. Kyabarungira is part of the coverage area of RCRA health services. Nineteen households were randomly selected from sub-county lists of households residing in three Kyabarungira parishes.

Research tools

Research was conducted using a mixed methods approach consisting of five research tools: (1) comprehensive survey administered to female heads of household, (2) visual hands-on card sorting game (CSG, Figure 4), (3) 24-hour dietary recall survey, (4) key informant interviews, and, (5) case stories of individual Kasese women. The survey questionnaire included sections on household demographics, food security and nutrition, health status and care, and garden characteristics, benefits and challenges. After pre-testing and slight revisions, the questionnaire and CSG were administered to fifty randomly selected households in the four sites described above.



1. "I am able to put money earned from the garden into the Village Savings Group to meet some future needs."

2. "We discuss together how much money to spend for different things we need."

3. "My garden provides vegetables for my family and for sale."

4. "Since we have the garden I am noticing the children are stronger and get sick less."

5. "Since having a garden I feel stronger and more hopeful about our future."

6. "I can afford to buy things like rice, oil, tea, sugar and beans for my family."

Figure 4: Card Sort Game Scenarios

The use of scripted picture cards (CSG) is useful for sensitive and nuanced topics that require unprompted respondent perspectives with little interviewer interference and bias,

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particularly in situations of high functional illiteracy [19]. The research team, in consultation with social workers and health professionals familiar with the site area, developed six scenarios and captions depicting experiences that may result from, or be related to, vegetable home gardening. A local artist made simple, realistic drawings on cards with short captions in the local language. While these scenarios did not emerge directly from the women (which could be a future more evolved application of the method), their verbal explanations of the cards selected revealed individual interpretations and significance.

The CSG was administered by first presenting the six cards face-up and reading their captions, before interviewers asked the women to select all scenarios they had 'experienced'. They were next asked to rank the top three cards by asking, 'if you would have had only one of these experiences, which one would you choose?', then providing a second and third choice, and recording their narrative explanations. Responses were recorded by the interviewers on tablets using Open Data Kit (ODK) software. The CSG narratives and interviews were transcribed, coded and analyzed for primary themes and variations using the online research analysis platform, Dedoose.

Dietary recall data were analyzed by household, and age and gender subsets, using the Household Dietary Diversity (Tufts University) and Minimum Dietary Diversity for Women (FAO and USAID) scoring methods. Survey data and CSG rankings were analyzed using Stata. Statistical analyses are limited by a small sample size of fifty households and smaller sub-groups.

The nine key informant interviews were also conducted using a semi-structured interview guide to gain multiple in-depth perspectives on the main research question. Informants were para-social workers from site villages, sub-county and district officers, VSG promoters, health providers, and RCRA staff. Three women in diverse circumstances were selected for in-depth interviews to document their case stories.

Home Garden Typology

In order to create a methodology for evaluating home garden success across survey households in the four villages, a typology was developed to encompass a range of success criteria. Points were awarded to gardens for the following categories, drawing from questionnaire and CSG data: (1) change in household vegetable consumption, (2) diversity of crops at time of interview, (3) income generation over the past twelve months, and (4) broad garden impacts (how many CSG cards were selected). Typology scores were then compared with key explanatory factors such as village, land access, and socioeconomic status, while explanations for weaker gardens could be explored to develop recommendations for improvement and expansion of gardens along all four criteria. Figure 5 displays the point breakdown for the four criteria typology.

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Points	Card Sorting Game	#Vegetables in Garden	#Months Sell Vegetables	Change in vegetable consumption before and after garden
0	Picked 0/6 garden cards	No Crops	0 Months	Decrease
1	Picked 1-2/6 garden cards	1-2 Crops	1-3 Months	No Change
2	Picked 3-4/6 garden cards	3-4 Crops	4-6 Months	Change by 1
3	Picked 4 or more garden cards	4+ Crops	6+ Months	Change by 2

Figure 5: Typology Scoring Criteria

RESULTS AND DISCUSSION

Across the four research sites, every household increased their vegetable consumption after starting a vegetable garden, showing how even small, seasonal gardens increase the availability of nutrient-rich foods. Still, results show considerable variability in garden success as displayed in Figure 6, the scoring distribution for each garden household out of a maximum of twelve points. The lowest thirty percent of households were identified to better understand barriers to garden success across the four sites. Overall, the results indicate that home gardens can improve vegetable consumption, dietary diversity, income, and savings of gardening households. The analysis that follows reports the results for each of these categories.

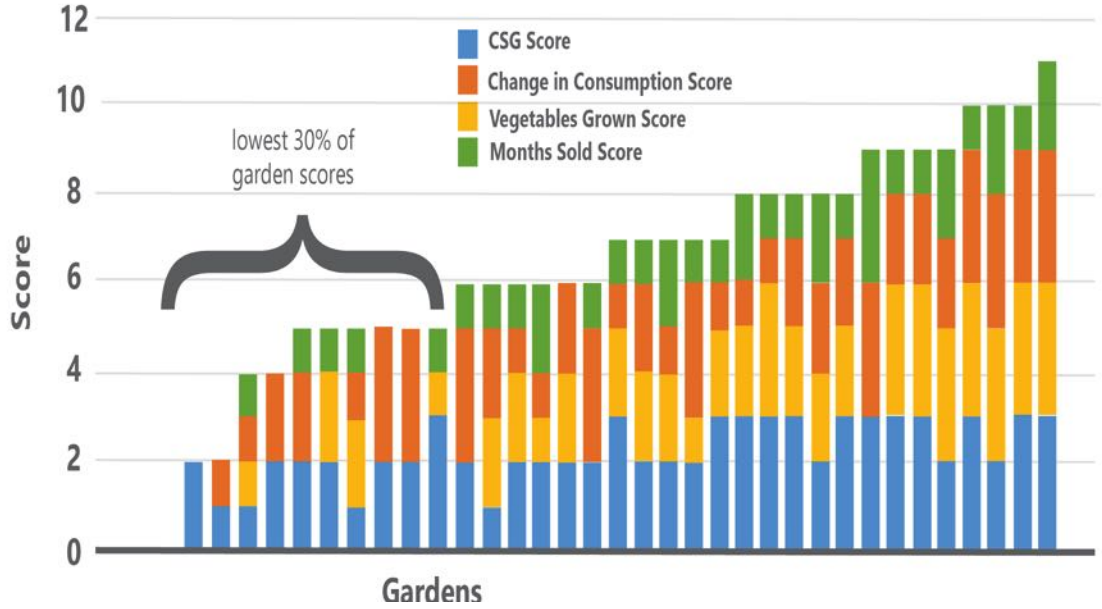

Figure 6: Typology Distribution

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Household Vegetable Consumption

Because gardens supply a consistent and accessible source of supplemental healthy food, they are key in improving nutrition, food security and dietary diversity. Of the households that have gardens, thirty percent reported their food availability over the last twelve months was 'better than average' compared to zero change in food availability for those without gardens.

To assess overall dietary intake, the garden typology calculated the estimated change in vegetable consumption per day before and after starting a garden. A majority of garden owning households increased the number of times they consumed vegetables per day, especially in Maliba. In Kyabarungira, while garden diversity and sales were low, vegetable consumption increased across all garden households. This indicates that what little vegetables are grown are directly consumed, rather than sold, and that even smaller, less supported gardens are able to increase family vegetable consumption.

The 24-hour dietary recall survey, confirming the above results, showed that almost ninety-five percent of household members with gardens consume vegetables as compared to eighty-one percent of household members without gardens. Further, thirty-one percent of men, twenty-eight percent of women and twelve percent of children with gardens eat more leafy vegetables than those without gardens. Clearly, as is observed in Kyabarungira, even families with unsuccessful gardens are increasing consumption of vegetables, a key nutritional indicator.

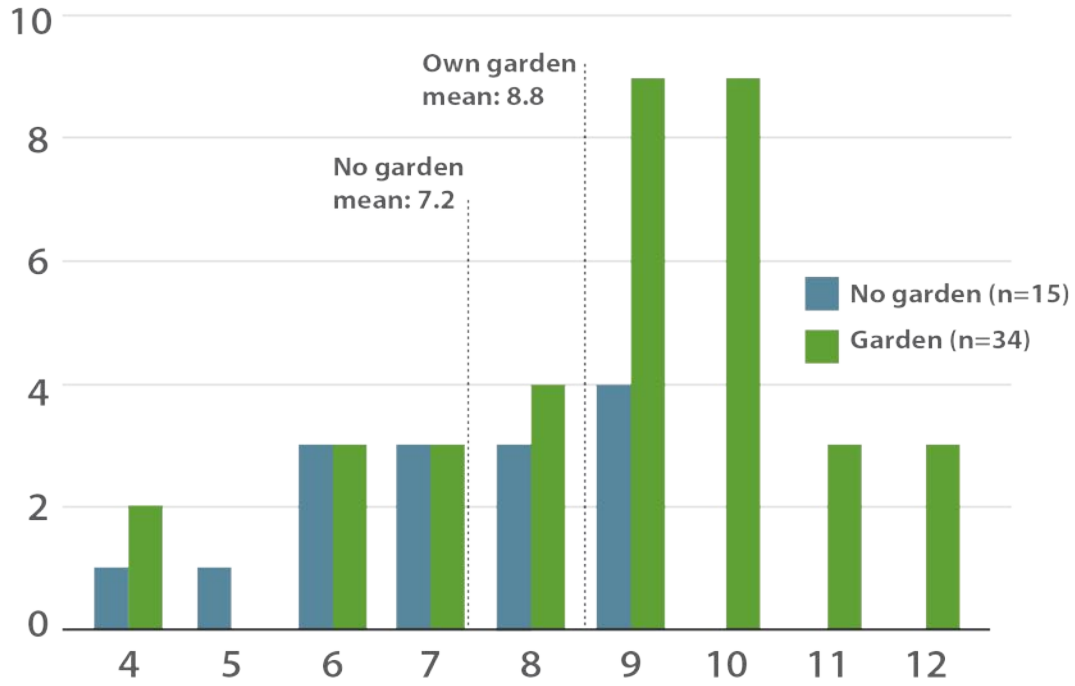

Figure 7: Household Dietary Diversity Scores

Using the Tufts University Household Dietary Diversity (HDD) scoring index, we were able to more concretely evaluate overall dietary diversity across a wide range of food

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categories [21]. Figure 7 displays the distribution of these scores for households with and without gardens. Garden households have an average dietary diversity score of 8.8, while those without gardens average a score of 7.2. This indicates that garden households are not only consuming more vegetables directly from their garden but also more protein-rich foods, carbohydrates, and other essential nutrients. Thus, not only do home gardens increase nutrition by direct consumption of vegetables, but families also use income generated from their gardens to buy other essential foods, as discussed in-depth in the next section.

Garden Diversity

Of the main crops grown in gardens, (eggplant, cabbage, dodo/spinach, tomatoes, onions, sukamawiki/kale, amongst others), an average of three were being grown at the time of the interview. The most successful gardens included all seven crops, while several of the least successful gardens had no crops at the time of the interview. A diverse garden is key in meeting year-round nutritional needs, and is also important for soil fertility, pest management, and income generation.

According to respondents, the dominant challenges to achieving year-round production of diverse crops are access to land, seeds, adequate training, and serious problems with pests and disease. Residents of small trading towns, such as Hima, where only twenty percent of respondents own land, face additional challenges. Landlords may prohibit tenants from growing small gardens adjacent to their shacks, while land for community gardening is also scarce. In Kyabarungira, only twenty-one percent of selected households have gardens, which were largely self-started. Thus, increasing land access in small towns and comprehensive training and monitoring in all sites are key for ensuring gardens can grow a diversity of crops year-round, and households will benefit from increased nutrition, income generation, and savings.

Income Generation and Savings

In households with successful home gardens, families grow enough vegetables to both eat and sell the surplus at local markets. In our sample, seventy-one percent generated income from their gardens, varying in capacity to sell year-round with an average of four months a year. For the eighty percent of households that harvest vegetables year-round, gardens provide supplemental or even main sources of food and income during lean season months (January-April). Among the lower scoring households, seventy-percent sold vegetables for just one month or not at all. This supports the conclusion that garden production goes first to household consumption rather than sale. For households with smaller, less diverse and lower yield gardens, there is simply not enough produce to sell, so households miss the significant secondary benefits of income generation and savings.

Women are the primary and sometimes only family members tending to the garden, and gardens are key in providing these women an independent income. In comparing baseline social conditions in Maliba and Kybarungira, the sites with the largest number of study households (twenty and nineteen, respectively), are similar in average age of female head, early forties, and average family size, 6.5 members, but differ in the percentage of women living without a partner, which was thirty-one percent in Kyabarungira and just twenty percent in Maliba.

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Past scholarship has found that when women are able to generate an income, this money is used predominantly on the needs of their children — schooling, nutrition, and health [21, 22, 23]. Similarly, in our research, for households that generated garden income, the majority of that income was spent on children's school supplies and fees, food, and future savings (seventy percent). Of the nearly thirty-percent of income that was spent on food, most was spent on essential dry goods such as salt, oil, and sugar (Figure 8), with another fifteen-percent spent on nutritious foods including beans, meat and fish.

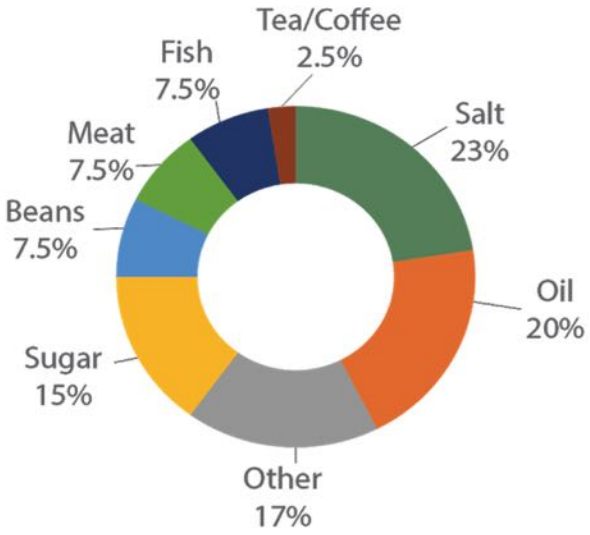

Figure 8: Food Items Purchased with Garden Income

Additionally, for CSG, the most frequently selected card, by ninety-two percent of respondents, and the one ranked highest, is "*I am able to put money earned from the garden into the Village Savings Group to meet some future needs."* Thus, home gardens provide vegetables for consumption, supplemental income for daily nutritional needs, and also enable saving for the future.

Improved Health and Welfare

The final typology category was taken from the results of the CSG for which participants gave a ranked score of 1 to 3 for each of the garden cards they selected as 'experienced.' On average, survey households selected four out of six cards, with a range of 1 to 6. Figure 9 shows the ranking of the cards corresponding to a weighted score of 5 for first choice, 3 for second choice, and 2 for third choice, divided by the total possible score, creating an index of 0 to 1.

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Card Number	Card caption	Experienced: Frequency chosen* *(n=34)*	Weighted Rank* (0-1) *(n=34)*
1	***"I am able to put money earned from the garden into the Village Savings Group to meet some future needs."***	**0.92**	**0.37**
2	***"We discuss together how much money to spend for different things we need."***	**0.44**	**0.17**
3	***"My garden provides vegetables for my family and for sale."***	**0.74**	**0.32**
4	***"Since we have the garden I am noticing the children are stronger and get sick less."***	**0.77**	**0.29**
5	***"Since having a garden I feel stronger and more hopeful about our future."***	**0.62**	**0.15**
6	***"I can afford to buy things like rice, oil, tea, sugar and beans for my family."***	**0.74**	**0.26**
Note: The CSG weighted ranking assigns weights based on first (5), second (3), and third (2) choices divided by the total possible score (5 x 34 = 170), creating an index from 0-1			

Figure 9: Garden and income generation scenarios for garden owning households

The CSG scenarios reflect the impact of home gardening on different aspects of household welfare, including children's health, joint-decision making with partners, and hope for the future. Seventy-seven percent of respondents selected the card "*Since we have the garden I am noticing the children are stronger and get sick less,*" highlighting the importance of gardens as an entry point for nutrition and improved health. Forty-four percent of women selected the card "*We discuss together how much money to spend for different things we need*" and sixty-two percent selected the card "*Since having the garden I feel stronger and more hopeful about our future.*" These two card selections highlight the capacity of gardens and income generation to increase women's ability to advocate for themselves, their children, and their future. In addition, as mentioned above, the card selections confirm the high frequency and ranking of garden income saved

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(ninety-two percent), production of vegetables both for family and sale (seventy-four percent), and increased ability to purchase diverse foods (seventy-four percent).

Amongst the bottom thirty percent of gardens in typology scores, the biggest divergence with more successful gardens was in the frequency that cards 5 (forty percent) and 6 (forty percent) were selected, indicating less capacity to generate income from gardens and purchase basic items for the family, consequently, less positive hope for the future. As an example, a widow, mother and grandmother from Mubuku generates income from her small garden but not enough to sell and support her family: "*With the garden the children eat vegetables daily but the family eats just one meal a day. I struggle like any other person to raise food. When I get the food, we eat it. When I don't get, we don't eat. Sometimes I dig in peoples' gardens and make some little money like 3000USH,*" which is less than $1USD. Catherine[5], a young single mother from a Kyabarungira parish has a very small garden and is unable to produce enough food for her eight children or surplus for sale. Though her dream is to expand her garden into a sustainable business enough to support her family and build a new home, its size and lack of diversity are limiting. She explained, "*there are others who have big plots of lands for digging and they have succeeded in achieving their dreams. Now me with my small garden and the little produce I get from it. I must labor extremely hard to ensure that I also get my own house.*" An expansion of this garden program, with specific suggestions outlined in the next section, is key to bringing the multitude of benefits of home gardening to mothers like Catherine.

CONCLUSION

This research shows the promise of small vegetable gardens to improve vegetable consumption, dietary diversity, income, and savings of gardening households. In some cases, the findings show improved food security from year-round garden sales and mitigation of lean season hunger. An important result from the 24-hour nutrition recall survey, confirmed by the selection of cards in the CSG and questionnaire responses, is the higher consumption of leafy green vegetables high in iron and vitamin A among families with gardens, leading to 'stronger children' and improved family health. Therefore, regarding our research question, there is evidence to affirm that a garden intervention for nutritional benefit can be an effective entry point to achieve broad household welfare. This conclusion is supported by many previous studies on garden initiatives for improved nutrition around the world [24].

Yet, baseline conditions, such as access to land, water, and money, and technical and material support received, have critical consequences for garden success and sustainability. In our typology analysis, gardens with below mean scores were unable to produce vegetables year-round mainly due to pest problems and lack of technical assistance, as well as small garden size. Where gardeners were able to adopt key agroecological practices in their gardens, such as mulching, composting and crop diversity, they reaped multiple benefits despite challenges with pests and disease.

[5] Names have been changed to preserve participants' privacy

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ajfand SCHOLARLY, PEER REVIEWED
AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT
Volume 21 No. 1 January 2021
PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST
ISSN 1684 5374

There are a number of steps that can be taken locally to address the problems identified, and to scale the pilot gardening project to include a much larger number of interested households with nutritional deficiencies and food insecurity. To improve and scale up home gardens for better nutrition and health, we recommend that RCRA adopt a model of technical assistance that combines additional qualified staff, Gardener Field Schools, 'model gardener' peer support, and a strong partnership with the School of Agriculture and Environmental Science at MMU and their student field internship program. Staff from RCRA and agroecology-trained MMU interns would provide technical assistance for home and community garden demonstration sites, lead Gardener Field Schools in interested villages, and promote use of mobile technology to refer, diagnose and treat pest, disease and soil problems, among other innovations.

As an example of the types of support required from local government, Figure 10 provides action recommendations for the Kasese District Departments of Urban Planning, Community Development, Public Health, and Education. Budget and planning collaboration across all four departments will multiply the impact of their respective and joint interventions. For example, to address the issue of food insecure tenants lacking access to land for gardening, the Urban Planning Department can play a pivotal role in requiring landlords to permit home gardening on land adjacent to tenant shelters. But these small-size gardens will require adequate assistance from the Community Development Department and MMU Agricultural Science Interns to overcome likely problems with year-round planting, pests and water access, among others. Finally, establishing garden demonstration sites and home garden outreach in small trading towns, as well as rural villages, are inclusive approaches appropriate for Kasese District and the many fast urbanizing areas of Uganda and sub-Saharan Africa more broadly.

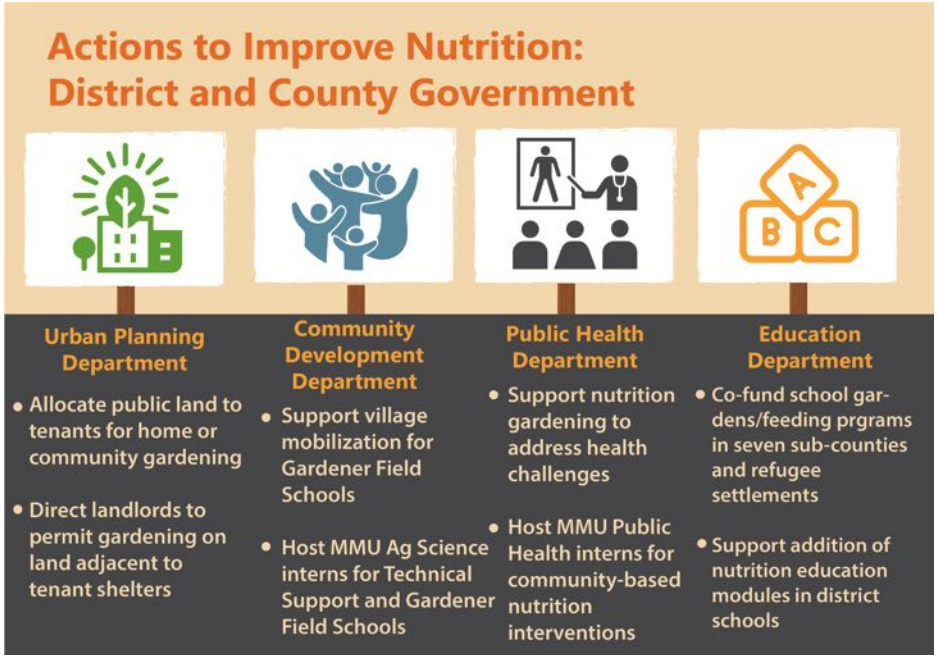

Figure 10: Recommendations for Local Government

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ajfand SCHOLARLY, PEER REVIEWED
AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT
Volume 21 No. 1
January 2021
PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST
ISSN 1684 5374

ACKNOWLEDGEMENTS

We would like to acknowledge the excellent research collaboration of field team members Guillaume Hansel of UC Berkeley and Lillian Masika and Roselyn Masika of Mountains of the Moon University, and the skilled supervision of Social Sciences Dean Doreen Amooti Basemera of MMU. Guillaume also led the team on data collection and analysis. We also wish to acknowledge the creativity of graphic designer Daniela Solis, who turned the research data into compelling infographics for presentation to a variety of stakeholders (available upon request to the co-authors). Finally, we are most grateful to the many women gardeners and their families who lent us their time and shared their perspectives to bring to light the promise and challenges of vegetable gardening in Kasese District.

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