



To Consume or to Sell:

A MIXED-METHODS STUDY ON HOUSEHOLD UTILIZATION OF HOME GARDEN PRODUCE IN MUHANGA AND KARONGI DISTRICTS IN RWANDA



Caritas Diocésaine Kabgayi



Cover Photo: EKN program beneficiary—a mother with her child under two years—tends to her home garden in Kibangu Sector, Muhanga District / Photo by Zacharie Manirarora

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**To Consume or to Sell:
A Mixed-Methods Study on Household
Utilization of Home Garden Produce
in Muhanga and Karongi Districts
in Rwanda**





Executive Summary

Through the Embassy of the Kingdom of the Netherlands (EKN) program, Catholic Relief Services (CRS), with partners Caritas Kabgayi and the Eglise Presbyterienne au Rwanda (EPR), aims to accelerate the reduction of stunting in children under two (CU2) in two districts in Rwanda by increasing dietary diversity and food security. The program uses an integrated approach to combat child malnutrition, which addresses nutrition knowledge and behaviors, agriculture productivity, and economic strengthening. One component of the program works to increase the availability of nutritious foods in households by promoting the installation and management of home gardens. For home gardens to be an effective vehicle for improved nutrition and food security, households must either grow and consume nutrient-rich produce, or use the income gained from the sale of home garden produce to purchase complementary foods or cover other health-related expenses.

OBJECTIVES

The purpose of this study is to inform CRS/Rwanda on ways that beneficiaries use home garden produce to promote household nutrition. Specifically, the objectives of this study are to better understand:

- The decision by households to consume or sell home garden produce in ways that contribute, or do not contribute, to reinforcing nutrition pathways; and
- The purchasing patterns stemming from the income earned from the sale of home garden produce and the extent to which these choices reinforce nutrition pathways.¹

METHODOLOGY

This exploratory study was carried out in Muhanga and Karongi Districts using a mixed-methods approach, which involved 12 structured Focus Group Discussions (FGDs), 22 Key Informant Interviews (KIIs), and 101 household surveys. The populations targeted for these data collection exercises included program beneficiaries, Community Health Workers (CHWs), Farmer Promoters, EKN program team members, and local leaders.² The questions were designed to prompt discussion and gather information around the topics of crop selection, household consumption, and market access. Once the data were collected, the quantitative data were tabulated and summarized and the qualitative data were coded and analyzed for recurring themes and trends.

KEY FINDINGS

The insights derived from this study can be grouped into two broader findings:

- **Home garden produce is primarily consumed at the household level**, rather than sold.
- **Home gardening is a source of income**, particularly from sale of surplus production.

With only a few exceptions, the produce grown in the home gardens is consumed at the household level. This is a positive finding, as one of the main objectives of the project was to improve dietary

¹ Home gardens can affect household nutrition through several “pathways,” such as improving production of diverse foods for consumption, increasing agricultural income for expenditure on nutrition- and health-related goods and services, such as insurance (Herforth and Harris, 2014).

² Farmer Promoters are volunteer community leaders in each village that are trained on agricultural best practices appropriate for each season to share techniques with communities. The scaling and formalization of the Farmer Promoter model is part of the Government of Rwanda’s new Twigire Muhinzi National Agricultural Extension Strategy.

diversity. Crop variety decisions in production impact families' consumption decisions. Most participants reported being pleased with the observed benefits with the home garden intervention, especially regarding the improved nutrition status observed among CU2. The decision to sell produce is most commonly driven by surplus production, although taste preference, strength of market linkages, and capacity and skills in post-harvest storage and transformation also play a role.

Regardless of respective individual productivity, almost all participants interviewed and surveyed hope to improve their home garden yields and are interested in programming aimed at improving agricultural production, including training on food storage and processing techniques. Agriculture is the main source of income for almost all the EKN beneficiary families and increased productivity translates into increased household-level assets. Many respondents expressed interest in further improving production with the intent of selling surpluses.

Based on the findings of the mixed-methods study, the following recommendations are provided for consideration and inclusion into future home garden and nutrition programming by CRS/Rwanda:

KEY RECOMMENDATIONS

- **Enhance social behavior change communication (SBCC) for nutrition:** Despite many nutrition awareness activities that have been organized by the Government of Rwanda (GOR) and non-governmental organizations (NGOs), including CRS, Caritas Kabgayi and EPR, education remains a vital element of successful home garden programming to ensure that the nutritional value of produce is appropriately considered when making the household decision to consume or sell harvested crops. The EKN Program has observed progress in this area, but study findings suggest that activities aimed to promote food preparation, transformation, and preservation techniques are also necessary, especially with foods that are not traditionally consumed in rural Rwandan communities, such as beetroot and zucchini. In future programming, education and sensitization related to nutrition, food preparation, transformation, and preservation should continue to accompany home garden and agricultural productivity interventions with a focus on non-traditionally consumed foods. Nutrition education should target the whole household—men and women—for best results, and may incorporate peer-to-peer learning strategies as well.
- **Improve post-harvest handling and storage:** Training on post-harvest handling and storage techniques should be incorporated into home garden programming. Households that are producing surpluses may sell their harvests precipitously because there is little knowledge about how to effectively process and/or preserve nutritious foods for later consumption. This will be especially beneficial to families during periods when there is low market supply of produce and, consequently, diverse and nutritious food is expensive to purchase.
- **Increase training on agricultural productivity and bio-intensive agriculture techniques (BIATs):** Agricultural productivity trainings, especially as they relate to BIATs, should be more numerous and in-depth. Although there was much success and positive response from program participants concerning their home garden yields, a significant portion of beneficiaries reported producing only enough to partially meet household requirements, with nothing left to sell. Farmer Promoters should continue working through FFLS to promote BIATs, such as manure composting and pest control, while also emphasizing, to the extent possible, cost-efficient irrigation and water conservation methods.
- **Support agriculture and business planning activities:** A substantial number of study respondents cited input constraints (especially water) as the biggest challenge limiting household production. Future programs should support households' ability to forecast their

input and financial needs for upcoming seasons and to make the necessary preparations, which may involve the selection of specific produce crop varieties to plant depending on the season, fertilizer preparation, or closer support from Farmer Promoters in identifying the techniques most suited to a household's plot (such as a double-dug bed, zay pit, or step garden). In addition to trainings and accompaniment concerning agriculture planning, opportunities emerged in the study to strengthen synergies with Savings and Internal Lending Communities (SILC) and Farmer Promoters to ensure access to needed inputs and to help recover from financial shocks. Farmer Promoters and SILC Field Agents can reinforce a culture of saving by more actively encouraging households to deposit income from the sale of home garden produce into SILC savings groups.

- **Develop local market demand for nutritious produce:** Beyond urban and peri-urban marketplaces, the demand for nutritious vegetables in Rwanda remains underdeveloped. Families may be reluctant to grow nutrient-dense crops if there is no locally accessible market where surpluses can be sold. To improve the availability of nutritious foods in the marketplace and promote sustained dietary diversity among target populations, local producers must be motivated to grow a variety of nutrient-dense crops. Continuing nutrition and food preparation education, such as cooking demonstrations and SBCC activities in communities and schools, can contribute to increased demand, as can training in food processing activities, which require a continuous supply of nutritious inputs for production.



*Husband and wife work together in their home garden supported by the EKN program in Gishyita Sector, Karongi District
Photo by Zacharie Manirarora*



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Acronyms

BIATs	Bio-Intensive Agriculture Techniques
CBF&NP	Community-Based Food and Nutrition Program
CFSVA	Comprehensive Food Security and Vulnerability Assessment
CHW	Community Health Worker
CRS	Catholic Relief Services
CU2	Children Under Two
DHS	Rwanda Demographic and Health Survey
EDPRS	Economic Development and Poverty Reduction Strategy
EKN	Embassy of the Kingdom of the Netherlands
EPR	Église Présbytérienne au Rwanda (Presbyterian Church in Rwanda)
FFLS	Farmer Field Learning School
FGD	Focus Group Discussion
GHI	Global Hunger Index
GOR	Government of Rwanda
HDI	Human Development Index
IHD	Integral Human Development
KII	Key Informant Interview
MCH	Maternal and Child Health
MOH	Ministry of Health
MINAGRI	Ministry of Agriculture and Animal Resources
MUAC	Mid-Upper Arm Circumference
NGO	Non-Governmental Organization
PD/H	Positive Deviance/Hearth
PICS	Purdue Improved Crop Storage Bag
PLW	Pregnant and Lactating Women
SBCC	Social Behavior Change Communication
SILC	Savings and Internal Lending Communities
UNICEF	United Nations Children’s Fund
VNS	Village Nutrition Schools

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Background

INTRODUCTION AND RATIONALE

Rwanda has made substantial development progress in the last 20 years, even boasting the world's tenth fastest growing economy in the 2000s. During the implementation of the first phase of the Economic Development Poverty Reduction Strategy from 2007 to 2012, the country observed **sustained economic growth** (8% average), **notable poverty reduction** (12% reduction to 45%) and **less income inequality** (0.52 to 0.49, as measured by the Gini coefficient inequality measure).³

Despite impressive social and economic advancement, Rwanda is still ranked 163 out of 188 in the Human Development Index (HDI), positioning the country in the low human development category.⁴ Rwanda also faces challenges related to persistently high levels of chronic malnutrition, with 38% of children under-five impacted by the effects of stunting.⁵ Although acute malnutrition rates remain relatively low in Rwanda, hunger continues to be a critical issue, as the 2016 Global Hunger Index Report (GHI) ranks Rwanda 75th among 102 countries 'with serious hunger.'⁶ These indicators can be partially explained by household challenges associated with access to food, as noted in the 2012 Comprehensive Food Security and Vulnerability Assessment (CFSVA). In the report, 51% of households were found to experience some difficulty accessing food, while 14% of the population experience 'chronic difficulties' attaining food for their families.⁷ Faced with uncertain food security, families rely on a few traditional, starchy staple crops, leading to challenges in dietary diversity. In 2014-15, the Rwanda Demographic and Health Survey (DHS) reported that 66% of children between the ages of six and 11 months are anemic.⁸



Child in Buruba Village, Muhanga District whose family participates in CRS/Rwanda child nutrition programming / Photo by Laura Elizabeth Pohl

The Government of Rwanda (GOR) recognizes the importance of nutrition in achieving national economic and social development goals and is committed to eliminating child malnutrition by **improving access to age-appropriate, balanced diets** and healthy living environments.⁹ An

³ Economic Development and Poverty Reduction Strategy II, 2013-2018. Kigali: n.p., 2013. Ministry of Finance and Economic Planning (MINECOFIN). Web. 9 Nov. 2016.

⁴"Rwanda." Human Development Report 2015 (2015): 1-7. Work for Human Development. United Nations Development Programme. Web. 1 Nov. 2016.

⁵National Institute of Statistics of Rwanda (NISR) [Rwanda], Ministry of Health (MOH) [Rwanda], and ICF International. 2015. Rwanda Demographic and Health Survey 2014-15: Key Indicators. Rockville, Maryland, USA: NISR, MOH, and ICF International.

⁶ von Grebmer, Klaus; Bernstein, Jill; de Waal, Alex; Prasai, Nilam; Yin, Sandra; Yohannes, Yisehac. 2015. 2015 Global hunger index: Armed conflict and the challenge of hunger. Bonn, Germany; Washington, D.C. and Dublin, Ireland: Welthungerhilfe; International Food Policy Research Institute (IFPRI) and Concern Worldwide.

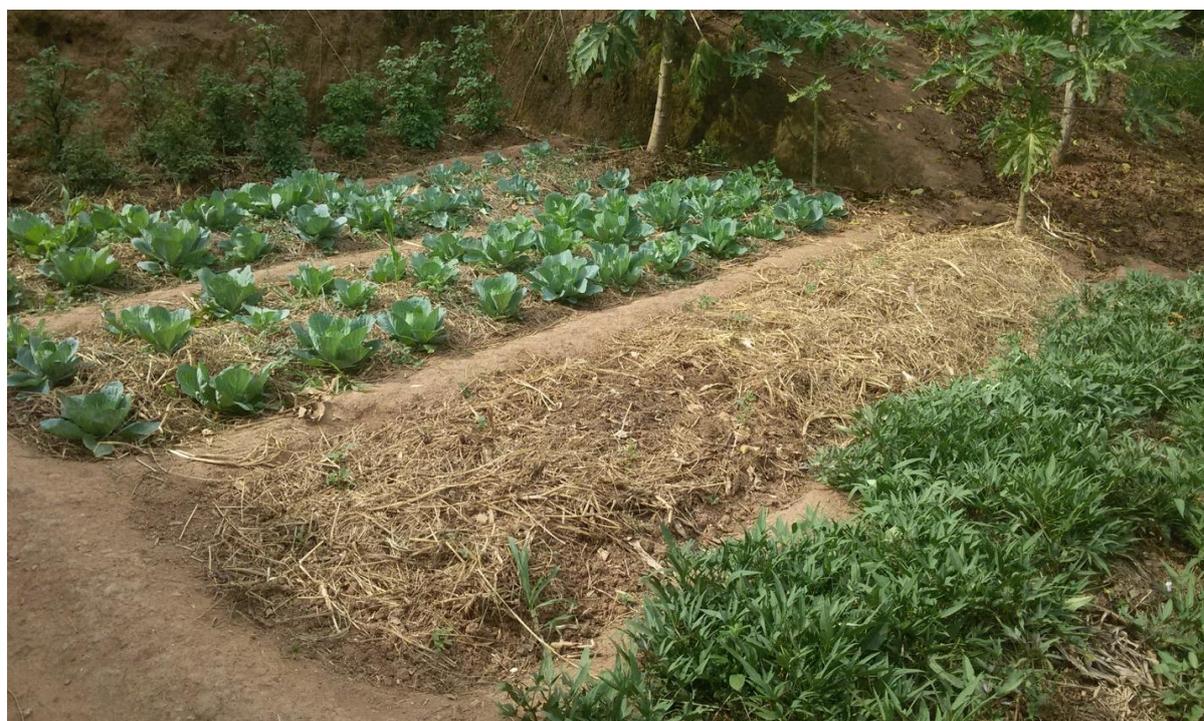
⁷ National Institute of Statistics of Rwanda, Ministry of Health, and World Food Programme. Rwanda 2015 | Comprehensive Food Security and Vulnerability Analysis. Publication. World Food Programme, Mar. 2016. Web. Oct. 2016.

⁸ National Institute of Statistics of Rwanda (NISR) [Rwanda], Ministry of Health (MOH) [Rwanda], and ICF International. 2015. Rwanda Demographic and Health Survey 2014-15: Key Indicators. Rockville, Maryland, USA: NISR, MOH, and ICF International.

⁹ Ministry of Local Government, Ministry of Health, and Ministry of Agriculture and Animal Resources. Rwanda National Food and Nutrition Policy. Rep. Republic of Rwanda, Jan. 2014. Web. Sept. 2016.

important feature of the GOR's nutrition strategy is the promotion of Community-Based Food and Nutrition Programs (CBF&NP) to promote the consumption of more nutrient-rich and diverse meals, which requires improved education about and access to nutritious foods.¹⁰ With the support of the international development community, the GOR encourages the installation of home gardens as one important strategy to improve household nutrition. Home gardens are kept at the individual household level and are generally composed of various foods and agricultural products, such as staple crops, vegetables, fruits, and livestock for home consumption or for income generation.¹¹

Over the past several years, CRS/Rwanda has promoted communities' access to healthy, diverse foods by supporting the installation and management of home gardens through several projects, including the EKN program. To better understand program dynamics to continually improve program approaches, CRS/Rwanda has an interest in understanding how home garden interventions are contributing to the improved nutritional status of households. In conducting this analysis, CRS/Rwanda aims to better understand how families decide to use produce grown in home gardens and whether the produce positively impacts the beneficiaries' nutrition outcomes. The findings are intended to inform CRS/Rwanda programming to strengthen the design and implementation of household nutrition, food security, and economic strengthening activities.



Home garden in Cyeza Sector, Muhanga District / Photo by James Haganza

PROGRAM CONTEXT

Dating back to the beginning of modern agriculture, when subsistence gardens were maintained on small plots of land around the residence, **home gardens have played important roles in household nutrition, food security, and income generation.** Numerous studies document and profile the

¹⁰ Ibid.

¹¹ "Improving Nutrition through Home Gardening." FAO Corporate Document Repository. Food and Agriculture Organization of the United Nations, 2001. Web. 23 Oct. 2016.

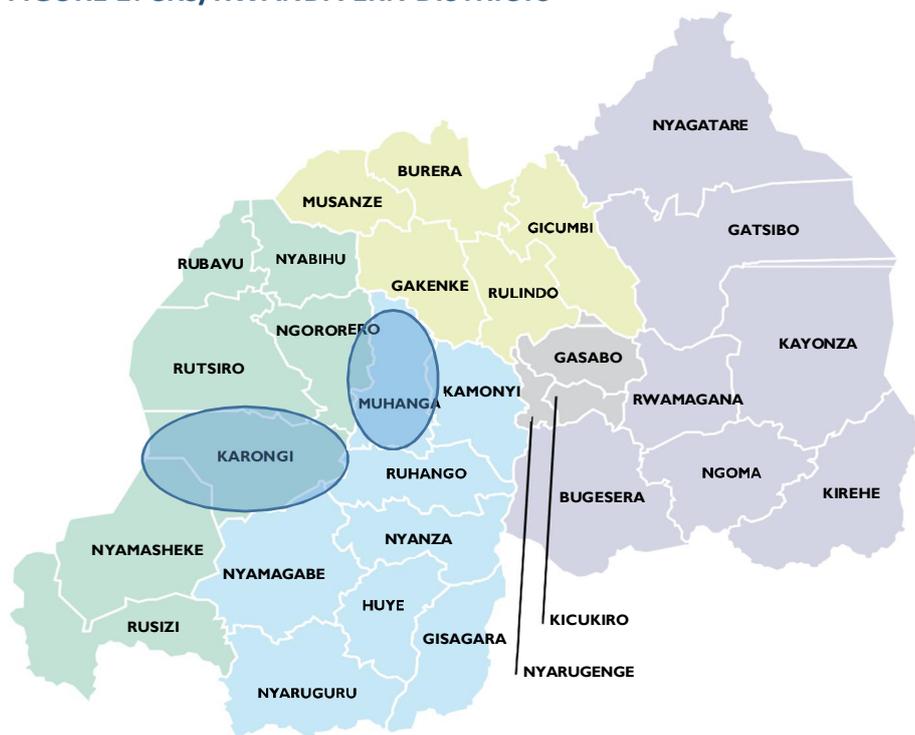
benefits of home gardens for communities and their families,¹² including as one strategy to build household resilience and to reduce the negative impacts of global climatic and food shocks, as well as price fluctuations.¹³ The GOR’s CBF&NP program promotes installation of home gardens for greater dietary diversity, a key challenge in reducing chronic malnutrition in Rwanda.¹⁴

EKN Program Overview

The **EKN program** is a three-year project, funded by the Embassy of the Kingdom of the Netherlands in Rwanda through the United Nations Children’s Fund (UNICEF), which aims to accelerate the reduction of stunting rates in CU2 across Rwanda. The program uses an integrated approach to address child malnutrition, which includes nutrition, agriculture, and economic strengthening components.

CRS/Rwanda has been implementing the EKN program in 868 villages in the Muhanga and Karongi Districts since January 2013 (see Figure 1). In each village, CRS/Rwanda has worked with approximately 30 households targeting pregnant and lactating women (PLW) and CU2 with an emphasis on households particularly vulnerable to malnutrition, as identified by health centers, growth monitoring data, and village leaders. In the third year of the project, CRS/Rwanda identified entry points for greater engagement of fathers in promoting household nutrition.¹⁵

FIGURE 1: CRS/RWANDA EKN DISTRICTS



Improved nutrition is promoted through Village Nutrition Schools (VNS), a strategy that integrates nutrition, economic strengthening, and agriculture components. The nutrition activities include

¹² Marsh R: Building on traditional gardening to improve household food security. *Food Nutr Agr* 1998, 22:4–14.

¹³ Galhena et al.: Home gardens: a promising approach to enhance household food security and wellbeing. *Agriculture & Food Security* 2013 2:8.

¹⁴ Ministry of Local Government, Ministry of Health, and Ministry of Agriculture and Animal Resources. *Rwanda National Food and Nutrition Policy*. Rep. Republic of Rwanda, Jan. 2014. Web. Sept. 2016.

¹⁵ *Father Engagement in Nutrition: A Qualitative Analysis in Muhanga and Karongi Districts in Rwanda*. Rep. Catholic Relief Services, 2016. Web. 2 Nov. 2016.

education sessions, growth monitoring, and cooking demonstrations, along with the promotion of improved hygiene and feeding practices, using a modified form of the Positive Deviance/Health (PD/H) model. This model brings groups of 15-30 mothers of CU2 together for 12 consecutive days to learn how to prepare nutrient-rich meals.¹⁶ The EKN program also reinforces district-level structures to promote and implement the integrated approach and to effectively use the locally available monitoring and evaluation systems around nutrition.

VNS methodology supports household economic strengthening through the formation of SILC groups, where participants meet regularly and make contributions, later paying out the accumulated funds among all members of the group in proportion to their contributions. For the agriculture component, locally-chosen group leaders promote Farmer Field Learning Schools (FFLS) to improve food security, dietary diversity, and balanced diets through the adoption of BIATs, including home gardens, which encourage collective demonstration and experimentation with innovative cultivation techniques at the community and household levels. Producing on small plots of land requires maximization of land utilization. The EKN program has promoted BIATs, including kitchen gardens and other gardening techniques (i.e., dome gardens, step gardens, double dug and sunken beds, composting, Mandala gardens, and container gardening), using affordable inputs like organic fertilizers and pesticides.

Over the course of the EKN program, CRS and partners have trained district- and sector-level agronomists with the necessary skills and inputs to train Farmer Promoters in the target villages. Trainings also aimed to help CHWs better understand the organization and management of FFLS groups and the benefits of BIATs. Farmer Promoters organized households into FFLS groups consisting of PLW and parents of CU2. FFLS members learned improved farming techniques through a demonstration plot, which operated for up to two growing seasons. Land for the demonstration plot was contributed by the community, often the village chief or sector office. On a rotating basis, the FFLS group assisted individual group members to install a home garden at the household level.

MOTIVATION FOR STUDY

This analysis seeks to gain deeper understanding of the interplay of dynamics driving decisions of crop selection and post-harvest consumption or sale, and the extent to which these decisions reinforce pathways promoting improved household nutrition.

Concerning the household management of home gardens, research suggests that decisions related to crop selection, the acquisition of inputs, and harvesting are most often driven by the consumption and income generation requirements of the family.¹⁷ Planting decisions are made with the expectation to sell a portion of the crops after the harvest.¹⁸

Land is generally controlled by men; therefore, crops that men tend to manage are allocated more land. As seen from the table on the following page (Figure 2), crops are generally controlled by men if they are marketable.

¹⁶ The PD/Hearth groups are traditionally intended to be rehabilitative (i.e., children with moderate malnutrition participate to improve their nutritional status during the intervention); however, in Rwanda, the government has promoted this approach more comprehensively and groups may include women whose children are in a good nutritional state.

¹⁷ Galhena DH, Mikunthan G, Maredia KM: Home Gardens for Enhancing Food Security in Sri Lanka. *Farming Matters* 2012, 28(2):12.

¹⁸ Schaetzle, Thomas, Melissa Antal, and Agnes Guyon. 2014. Household Decision-Making on Homestead Food Production: Perceptions on Planting, Production, and Purchases in Bangladesh. Arlington, VA: USAID Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING) Project.

FIGURE 2: CATEGORIZATION OF CROPS BY GENDER

District	Crops for Women	Crops for Men	Crops Shared
Burera	Beans	Irish potatoes	Maize, wheat
Gasabo	Beans, sweet potatoes, cassava, maize, traditional vegetables (amaranth)	Banana, coffee, exotic vegetables (tomatoes, egg plants, cabbage, green pepper)	Fruits
Kirehe	Maize, beans, flowers	Banana, coffee, pineapple	Sorghum
Nyabihu	Maize, beans sorghum (used mainly for brewing traditional beer)	Irish potatoes, cabbage, carrots	
Nyaruguru			
Highlands	Beans		Tea – planting is men, plantation and maintenance and picking is women, men sell Irish potatoes, wheat, maize
Middle veld	Beans, sorghum, sweet potatoes, cassava	Coffee	
Ruhango	Beans, sweet potatoes, vegetables	Cassava, coffee, rice	Maize

(MINAGRI, 2010)

In Rwanda, crop production is generally divided between the man and woman in the household and the respective division of responsibilities is rooted deeply in tradition, but is also related to the unequal separation of household duties. Research conducted by CRS/Rwanda, echoing MINAGRI’s findings summarized in the Figure above, suggests that women are primarily responsible for the production of home gardens and household staple crops, such as beans and maize.¹⁹ As men in Rwanda are generally considered to be the managers of all household income, crops that are considered to be men’s responsibilities are mainly cash crops.²⁰ Furthermore, men generally demonstrate authority over how the surplus that women generate is used, as well as how household income is allocated.²¹

Gaps in Understanding the Consume-Sell Decision

Agricultural production affects nutrition outcomes most directly by allowing for increased caloric intake and improving diet quality and diversity. Households that produce sufficient food for their own consumption are more likely to observe acceptable household food and nutrient consumption.²² This is, indeed, the rationale for the home garden—that small-scale, bio-intensive agricultural production can directly generate inputs for the family’s daily diet; however, **consumption is not the only option.** Selling produce from home gardens may be appealing and advantageous to individual households in order to meet other various household needs. To the extent that income generated from selling home garden produce is applied towards health needs of the household, including purchasing healthy foods, paying for health insurance, or covering the cost of visiting a clinic, it can still be considered to contribute to overall household health.

¹⁹ Catholic Relief Services Rwanda. Gikuriro Gender Analysis Report. Rep. United States Agency for International Development, 1 July 2016. Web.

²⁰ Ibid.

²¹ Gender Analysis for USAID/Rwanda Strengthening Capacity for Health Systems (SCHS) Project (2014) & Choi SY, Ting KF (2008) Wife beating in South Africa: an imbalance theory of resources and power. J Interpers Violence 23: 834–852. doi: 10.1177/0886260507313951. pmid:18292404

²² Marsh R: Building on traditional gardening to improve household food security. Food Nutr Agr 1998, 22:4–14.

The existing literature provides general information concerning the benefits and characteristics of home gardens, but there is a dearth of analysis addressing the decision to consume or sell produce from home gardens in Rwanda. CRS/Rwanda conducted the *To Consume or to Sell* study to explore:

- The decision by households to consume or sell home garden produce in ways that contribute to reinforcing nutrition pathways; and
- The purchasing patterns stemming from the income earned from sale of home garden produce and the extent to which these choices reinforce nutrition pathways.

GUIDING QUESTIONS FOR ANALYSIS

To gain deeper understanding of these dynamics, CRS designed an illustrative, mixed-methods study to assess household practices around home garden-produced crops. The study provided information about the crop varieties cultivated in the home gardens, which crops were consumed versus sold, and the reasons behind the decision to consume or sell.

To Consume or to Sell?

In addition to improving household nutrition by consuming home garden produce, CRS/Rwanda identified two pathways through which home garden produce may indirectly improve the nutrition and health of targeted beneficiaries: (1) by allowing for the direct purchase of supplemental, nutritious food from local markets, and (2) by providing income for either planned or unexpected health-related expenses.



Seraphine Nyiramajoro (left) and Cecile Kabagwira (right) peel orange-fleshed sweet potatoes during a cooking demonstration
Photo by Laura Elizabeth Pohl

Income generated by home gardens can be directed towards the purchase of nutritious food for the family, contributing to positive caloric intake and improved dietary quality. A number of factors may limit a household's ability to realize this pathway to nutrition, such as the producers' ability to grow marketable produce, access to viable markets, and general demand. Furthermore, the ability to purchase nutritious food with proceeds from home garden sales depends on the quantity, quality, and price of food accessible at local markets, household decision-making dynamics, and patterns of access and control of household income and resources.

This study generates both qualitative and quantitative data on how food produced in the home gardens is used, which contributes to a better understanding of the mechanisms by which home gardens contribute to improved nutrition and health outcomes. Specifically, the results of this study help identify the pathways to improved nutrition via home gardens in Rwanda and to identify barriers to small-scale, local market linkages.

DESIGN

Agricultural livelihoods affect household nutrition through multiple pathways, which are not always linear and are often intersectional. In general, CRS understands families' decisions to consume or sell household garden produce as being influenced by three factors—nutrition behaviors, agriculture productivity, and economic priorities—each of which is influenced by a series of internal and external pressures, including:

- Nutrition and health awareness;
- Gender decision-making dynamics;
- Geography and climate;
- Market environment; and
- Tradition and immediate financial pressures.

The EKN program addresses traditional behaviors and barriers contributing to systemic malnourishment in the target districts.

These contexts are important to understand when considering the impact that nutrition programming may have on the decision to purchase or sell home garden produce. The following subsections briefly describe how each of the interventions relate to the participants' behaviors:



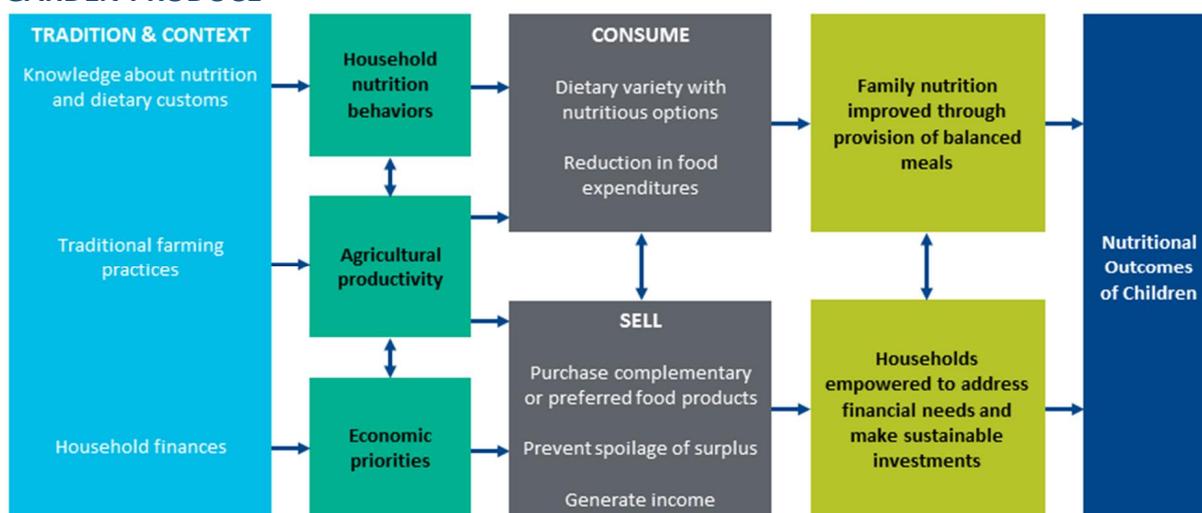
Sylvain Hangimana, Sylvere Hategekimana, and Francine Uwihanganye in front of their home with produce from their home garden / Photo by Laura Elizabeth Pohl

- **Nutrition Knowledge and Behaviors:** Knowledge maintained by family and community members can significantly impact household-level decisions related to nutrition. The decision on what will be consumed by the family is often held by women in the household, whereas men often allocate the funds to be used for consumption. When considering whether to purchase an item in the market, a consumer typically considers price, quality, taste, and convenience.²³ Nutritional value is also an important factor to the informed buyer. Nutrition education for men and women is necessary for target beneficiaries to appreciate the value of high-nutrient food, so that its consumption will be prioritized.
- **Agricultural Productivity:** Agriculture production levels, including those of home gardens, affect livelihoods because they directly impact the types and quantities of foodstuffs available to the household for consumption. Depending on the scale of the producers' collective productivity, increased supply of certain crops may also impact market demand and consequently push the prices for the crop or supplements downward. Any income earned from the sale of home garden produce can be used to pay for complementary foods or to cover other health-related expenses, also affecting nutrition outcomes.
- **Economic Priorities:** In most cases, agricultural sales are a primary source of income for rural households in the target districts. Decisions on how this limited income is used is often dictated by other existing household economic priorities and expenses. Earnings from the sale of home garden produce and the savings associated with consuming products grown at home can result in previously unavailable disposable income. The new resources can be invested in other income-generating activities or used to help cover other planned or unanticipated expenses.

²³ Pelto, G., and M. Amar-Klemesu. 2011. "Balancing Nuturance, Cost, and Time: Complementary Feeding in Accra, Ghana." *Maternal and Child Nutrition*. 7 (suppl 3) pp. 66-81.

The following analytical framework (see Figure 3) is adapted from Herforth and Harris (2014) to summarize the factors contributing to the household decision to consume or sell home garden produce:²⁴

FIGURE 3: ANALYTICAL FRAMEWORK FOR DECISION-MAKING ON THE USE OF HOME GARDEN PRODUCE



This exploratory study was carried out using a mixed-methods approach, to better understand the underlying dynamics and barriers that influence the decision of households to consume or sell their home garden produce. Due to the nature of the questions of interest, the data collection tools considered elements of crop selection, household consumption, and market access.

The qualitative data was gathered by trained enumerators who asked a series of open-ended questions during KIIs and FGDs. Responses were coded and aggregated into categories for analysis. KIIs were held with the following individuals, to diversify and enrich the perspectives included in this study:

- **CHWs/Farmer Promoters:** Six CHWs were interviewed due to their continuous coordination and support of community activities and their direct involvement in promoting BIATs. As they are based in the community, they are well-placed to observe trends in household-level practices around home gardens. Farmer Promoters were interviewed to help understand their perception and utilization of BIATs.
- **EKN program staff:** Local partner staff from Caritas Kabgayi and EPR work directly with beneficiaries daily and have clear insight into the realities of implementation of the BIATs. At least one project staff member per district, which included project managers, nutritionists and agronomists, were interviewed. The questionnaire examined their observations and perceptions of home garden products use and the existing factors that contribute to those practices.
- **Local leaders:** District, sector, and village authorities were interviewed to gain additional insights regarding the practices and trends within the community, as well as to learn about larger policy and economic implications of the intervention.

²⁴ Analytics framework adapted for EKN program and *To Consume or to Sell* study from Herforth, Anna, and Jody Harris. 2014. Understanding and Applying Primary Pathways and Principles. Brief #1. Improving Nutrition through Agriculture Technical Brief Series. Arlington, VA: USAID/Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING) Project.

Twelve structured FGDs of 10-12 participants each were conducted, within six randomly selected villages in each target district. Six of these groups included PLW and caregivers of CU2, while six of the groups included male heads of households with CU2 or a PLW. (See Figure 4 for sectors and cells.)

Quantitative data was gathered via the administration of household surveys that measured knowledge, attitudes, and practices related to home garden produce use. The surveys were conducted at the household level with EKN beneficiaries—members of FFLS/SILC groups who actively maintain their own home gardens. Both random and purposeful sampling techniques were applied in sampling the sectors and cells. The random sampling was applied in selecting ten sectors and ten cells in Muhanga and Karongi, while other households were purposefully selected because of their adoption of BIAT techniques. From these groups, 101 individuals were selected to participate in individual survey questionnaires to provide illustrative information concerning the decision to consume or sell home garden produce, which was triangulated with the qualitative findings.

FIGURE 4: GEOGRAPHIC SCOPE OF STUDY

Muhanga District		Karongi District	
Sector	Cell	Sector	Cell
Cyeza	Nyarunyinya	Murundi	Nyamushishi
Kiyumba	Budende	Gitesi	Gasharu
Nyabinoni	Nyarusozi	Twumba	Gisovu
Rongi	Karambo	Mutuntu	Murengezo
Rugendabali	Nsanga	Gashari	Mwendo

Once the qualitative and quantitative data had been collected and all FGD and KII notes compiled and transcribed, the quantitative data was tabulated and summarized, and the qualitative data was coded and analyzed for recurring themes and trends, as well as to facilitate the examination of divergent viewpoints.

ETHICAL CONSIDERATIONS

The study was conducted in a manner that ensured participants’ anonymity and confidentiality. Saunders et al (2003) provides a framework to reference to prevent participants’ rights from being violated. The publication states that appropriate engagement of participants ensures the following:

- Participants are given the option to participate
- Participants are not offered inducements beyond the scope of participation
- Participants are only contacted at reasonable times
- Study leaders abide by the level of consent provided by the participant
- Participants are not to be subjected to questions that create stress or discomfort
- Participants may refuse to answer any question

The *To Consume or to Sell* study respected the rights of participants as outlined above and also engaged participants on the basis of informed and signed consent.

LIMITATIONS

This study generates insights concerning use of home garden produce for consumption or sale. The mixed-methods nature of the study includes a combination of perspectives that were analyzed in sum to develop a contextualized account of the pressures and barriers affecting household decision-making on use of home garden produce in ways that contribute (or not) to improved household nutrition.

The surveys, focus groups and questionnaires are subject to self-reporting biases including selective memory, telescoping, attribution, and exaggeration. The questionnaires were designed in ways that would provide perspectives from different stakeholders so that inconsistencies could be identified; however, as the respondents were beneficiaries of a development intervention currently being implemented by the interviewer, respondents may have been tempted to inflate the positive benefits of the program to improve the chances of additional support or repeat interventions. Each respondent was told that responses would not impact the likelihood of future programming.

Participants were drawn from EKN program beneficiaries who maintained home gardens. As such, respondents had received considerable sensitization on nutrition practices. The study did not establish a comparison of home garden consumption/sale practices and preferences among a non-EKN control group.

The researchers had difficulty forming groups exclusively of men, as was the original intention; therefore, mixed groups of men and women were interviewed in some cases. During these exercises, married couples may have presented the level of coordination during decision-making on production, consumption, and sale more positively than may be the case, although the responses were fairly consistent in different regions. The relatively small number of male participants in the study means that gender dynamics in household decision-making were not explored in the depth desired. This remains an area for future study.

The sample size of 101 survey respondents was chosen to provide illustrative representation of household behavior in the target sectors and cells. In order to draw scientifically significant conclusions from survey data, a larger-scale exercise should be organized; however, this exploratory study provides a strong foundation from which to build future efforts.



Dominique Mazimpaka ties a seedling to a wire stake as part of a food diversification program / Photo by Laura Elizabeth Pohl

Household-Level Nutrition Decisions

The first phase of the EKN program has aimed to improve food security and nutrition among CU2 and PLW in targeted households in the Muhanga and Karongi Districts by promoting nutrition education, while increasing production and consumption of nutritious fruits and vegetables. The program sought to achieve these objectives by supporting the establishment of home gardens, providing nutrition education, and generating additional income for household members through the sale of surplus food products and other income-generating activities. This income was intended to be used to purchase other micronutrient-rich produce, as well as to help cover household expenses, such as health care and education.

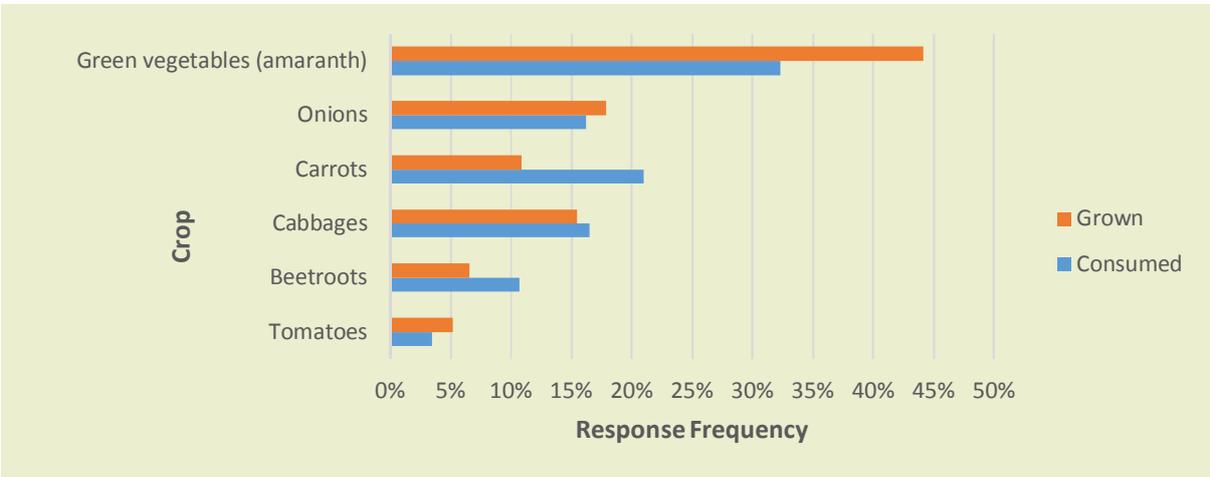
District-wide nutrition education is an important feature of the program because it is intended to directly impact the decision-making process regarding the consumption of nutritious and diverse foods. Without intentional education and behavior change activities, tradition may allow for households to continue purchasing the most familiar foods, including carbohydrates such as potatoes, rice, and pasta. While these foods are good base staples, carbohydrate overconsumption without adequate protein puts children at risk of both acute and chronic malnutrition. Without the motivation to change dietary habits and incorporate more nutrient-rich foods into household diets, unhealthy consumption behaviors will likely continue.

CROP SELECTION

Households reported growing a variety of crops in their home gardens. 44.1 percent of households reporting growing green vegetables (amaranth), making it the most popular crop produced in home gardens. The other most commonly grown home garden crops were onions, cabbages, and carrots.

Reasons reported for selecting certain crops to grow in home gardens vary and include nutritional value, ease of regional cultivation, accessibility of seeds, strong market demand, known soil benefits, and tradition. For example, a CHW in Murengezo Village explained that green vegetables (amaranth), cabbage, onions, and carrots produce high yields and are therefore attractive to local gardeners.²⁵ The main reason cited by the Social Affairs Officer in Muhanga District for selecting particular crops was that green peppers, cabbages, beetroots, and green vegetables (amaranth) were planted in large numbers because of the widespread understanding that these vegetables are high in nutrients and can protect the body from illness (see Figure 5).

FIGURE 5: CROP GROWTH AND CONSUMPTION

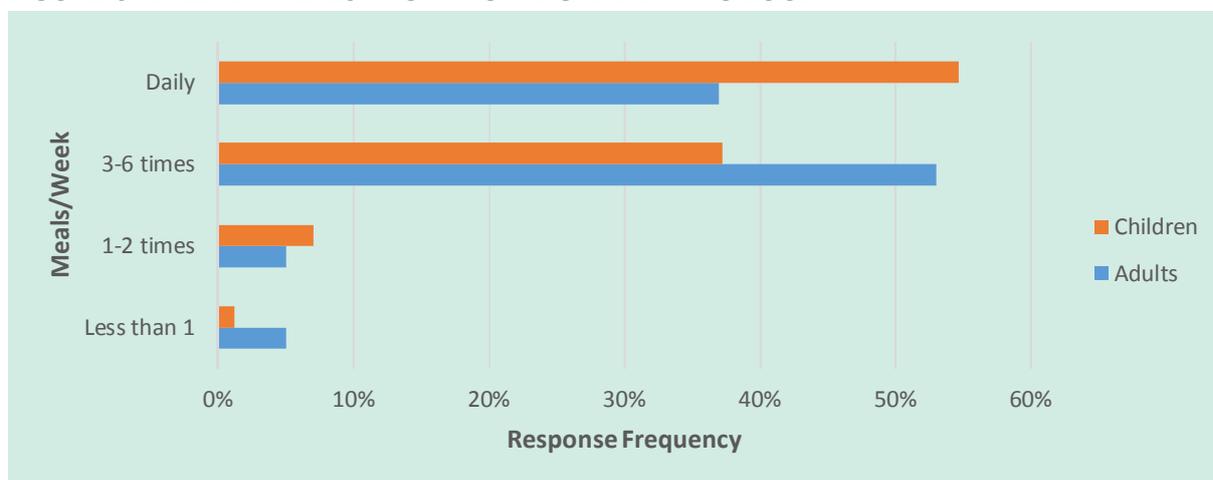


²⁵ Focus Group Discussion. 2016. Raw data. Murengezo Village, Mutuntu Sector, Karongi District.

CONSUMPTION FREQUENCY

Through the installation and management of home gardens, the improved production of fruits and vegetables provides rural households with access to nutrients that are otherwise difficult to obtain or beyond their economic means. Nearly all (96.0%) survey respondents were EKN beneficiaries and reported maintaining a home garden.

FIGURE 6: WEEKLY MEALS FROM HOME GARDEN PRODUCE



According to the data, 90.0% of adults and 91.9% of CU2 consume produce from their home gardens at least three times per week (see Figure 6). **Over half of CU2 consume produce from the home garden on a daily basis.**

Women maintain significant influence over the maintenance of home gardens and the utilization of the harvest. In the sample, mothers were reported as being responsible for food distribution within the household for 95.0% of the respondents. This is aligned with traditional Rwandan gender roles and responsibilities, by which domestic care work is reserved for women, including food preparation.²⁶ Men and women reported seeking consensus when making decisions about harvest utilization; however, in FGDs, men and women participants reported that women tend to make decisions concerning what portions will be consumed by the family and what crops can be sold.

“Every member of the household consumes home garden produce. We eat it two times a day, when there is enough grown. It has changed the nutritional status of our children. But not only our children—also everyone in the household, in general.”

—FGD, Kabageni Village, Gashari Sector, Karongi District

“All members of the household eat the home garden crops. The mother is in charge of eating habits and ensures that everyone in the household has been served.”

—FGD, Rugwiza Village, Rugendabari Sector, Muhanga District

DIETARY VARIETY

Crop selection frequencies tend to closely follow the crop consumption frequencies reported by households, indicating that the presence of produce in the home garden improves the likelihood that the variety will be consumed by the family.

²⁶ Agriculture Gender Strategy. Publication. Ministry of Agriculture and Animal Resources, Nov. 2010. Web. 26 Oct. 2016.

“This project has taught us to produce and eat vegetables. Every day, we give our children vegetables because they need them. Pregnant and breastfeeding mothers eat vegetables frequently because they need to have a balanced diet, too.”

—FGD, Kabageni Village, Gashari Sector, Karongi District

“Children eat home garden produce more frequently than others because they are more vulnerable to sickness. Some children eat the produce 3-4 times per week, while others eat from the gardens every day. Before the program, more people were in the yellow zone of MUAC, but now we have no cases of malnutrition.”

—FGD, Uwiraro Village, Mutuntu Sector, Karongi District

“Having home gardens is like we have a health clinic in our home. Our children are not falling sick.”

—FGD, Uwiraro Village, Mutuntu Sector, Karongi District

One strategy employed by CRS/Rwanda to improve dietary diversity and nutrition was to promote bio-fortified crops. These crops were promoted to households and seeds were provided to FFLS groups to encourage their production. These bio-fortified included beans rich in iron, maize rich in protein, and orange-fleshed sweet potatoes rich in Vitamin A.

While dietary diversity was promoted through the EKN nutrition and FFLS activities, most respondents (61.2%) had not incorporated bio-fortified foods into their diets. When asked how often families eat bio-fortified foods, 68.4% of respondents reported eating them less than once per week, while 26.3% said that they never eat them. These responses were analyzed and discussed by the EKN program team and a number of potential explanations were provided for the low reported uptake of bio-fortified crop production. First, the utilization of bio-fortified foods may have been low despite being promoted through the EKN program. Reasons considered for low uptake were insufficient education and accompaniment provided by Farmer Promoters related to the nutrition benefits of bio-fortified foods leading to low uptake or low input supply due to seasonal rains having destroyed demonstration plots before the bio-fortified seeds could be multiplied and distributed. Another potential explanation for the low reported uptake of bio-fortified crops is respondents' lack of awareness that they were using enhanced varieties of otherwise familiar vegetables. Iron-enriched beans and Vitamin A-enriched sweet potatoes closely resemble more common, less nutritious varieties. In this case, households may have underreported the utilization of bio-fortified crops due to lack of awareness, indicating the need for intensified efforts in this area in future programming including marketing of improved varieties.

COMPLEMENTARY FOODS

With the income derived of produce from home gardens, CRS/Rwanda expected that household nutrition would improve by enabling families to purchase complementary foods, as well as cover other health-related expenses. In all, 78.9% of respondents reported having used income from sale of home garden produce to purchase complementary food to eat in the past 12 months.

“When we sell our home garden crops, the profit can be used to buy cattle for fertilizer production or to buy other foods necessary to complement vegetables and other family issues. The selling of crops has improved the nutrition status of the household because you can buy cattle and cover other basic needs for the family.”

—FGD, Kagwiza Village, Rugendabari Sector, Muhanga District

“When you sell those vegetables from your home garden, you get money to buy small fish and peanuts, which complement other food.”

—FGD, Gasharu Village, Gitesi Sector, Karongi District

Survey data indicated that purchasing complementary food was the number one use of the income from home garden sales. Among families that generated income from the sale of home garden produce, **45.1% of crop sale proceeds were used to purchase complementary food.**

LIVESTOCK

In addition to the crops produced in the home gardens, 83.0% of the surveyed households keep livestock. Cows were the most common type of livestock, followed by pigs, poultry, goats, rabbits, and sheep. Most livestock owners (72.3%) reported consuming animal protein (i.e., eggs, meat, and/or milk) from livestock holdings at least once per month.

“When we have a good harvest, we eat it and supply the market with the remainder. With enough production, we can make much money and buy small livestock like hens, rabbits, etc.”

—FGD, Kabageni Village, Gashari Sector, Karongi District

“The profit is used to buy complementary foods so that a child can get a balanced diet and food variety. I even bought a hen that produces eggs for children.”

—FGD, Mugwato Village, Romgi Sector, Muhanga District

The use of livestock was not initially a focus of this study, although the frequent commentary concerning the use of home garden income to purchase small animals in order to provide balanced diets revealed an important pathway that should be considered when evaluating the impact of home gardens on household nutrition.

About one quarter (22.9%) of livestock owners reported **never eating products from livestock.** Upon evaluation of the FGD and KIIs, the EKN program team identified reasons why households may not be consuming animal products, which are directly related to the purpose of this study. First of all, religious beliefs in rural Rwanda may contribute to dietary choices, as Muslims and some denominations of Christianity, including Adventists, refrain from the consumption of pigs or rabbits. Secondly, nutrition education did not emphasize the health benefits of eating livestock products; therefore, households may not be valuing the nutritional benefits of milk, eggs, and meat and sold them to help cover other financial needs.

TASTE

Taste preferences can greatly influence the household decisions concerning crop selection and dietary choices, as well as the market viability of certain crop options. Many survey respondents reported enjoying the flavors of the home garden produce, even claiming to prefer it to crops locally available in the marketplace; however, taste preferences can be resistant to change and can be one of the barriers preventing households from adopting more nutritious and balanced diets. In fact, 5.4% of households reported selling their home garden produce in the market because of taste preferences. Beetroots and peppers, for example, are not traditionally consumed in rural Rwanda. Equipping families with recipes and cooking demonstrations are important components of the nutrition education programming because they help families explore appealing ways to prepare what may sometimes be unfamiliar produce.



*Pictures of cooking demonstration activities during weekly community health monitoring activities for the EKN program
Photos by Michael Stulman*

“The taste of our yield is good; there is no resemblance with other crops from the market.”

—FGD, Kabageni Village, Gashari Sector, Karongi District

“The home garden production is very delicious. That is why we consume it.”

—FGD, Musenyi Village, Kiyumba Sector, Muhanga District

Different markets have different characteristics. In some communities, certain crops, such as beetroot and green vegetables (amaranth), command premium prices because of their high nutritional values.²⁷ Reports of minimal demand for bio-fortified foods and other nutritious crops indicate that the dietary preferences in some areas do not reflect the nutrition education goals pursued in target communities.²⁸ Generally, market demand for nutritious and bio-fortified foods are strongest in urban and peri-urban settings in target areas. If there is no market potential for selling surplus products at market, then there is a substantial risk to the household to invest in producing these crops.

ADOPTION OF BIO-INTENSIVE AGRICULTURE TECHNIQUES

Reported adoption and utilization of BIATs at household level – including double dug and sunken beds, dome gardens, step gardens, container gardening, composting, and organic fertilizers – was substantial, with **the average respondent having employed BIATs for 1.84 years**. Consistent with the EKN program intervention timeline, a majority (57.0%) had been using BIATs (including home gardens) for two years. BIATs are an important feature of home garden interventions because the techniques support increased productivity throughout the year. Without the use of these techniques, home gardens will not remain productive year-round, which prevents the intended health benefits from being realized.

²⁷ Focus Group Discussion. 14 Jun. 2016. Raw data. Bucyeye Village, Nyarunyinya Cell, Cyeza Sector, Muhanga District.

²⁸ Ibid.

“There is a significant difference between those who use (BIAT) gardens and who don’t in terms of nutritional status of our children.”

—FGD, Gashihe Village, Twumba Sector, Karongi District

“The production is good because we have used fertilizers and water. When we care for our BIAT gardens, it gives good production even during the dry season.”

—FGD, Gasharu village, Gitesi Sector, Karongi District

“For those home gardens made using BIAT, the production is high in quantity, good quality, and takes a long time to spoil.”

—FGD, Ryakiyange Village, Nyabinoni Sector, Muhanga District

INSUFFICIENT PRODUCTION

Although a high percentage of EKN beneficiaries reported employing BIATs, a theme emerged in the KIIs and FGDs suggesting that a number of home gardens were unable to produce quantities of fruits and vegetables that met household nutrition and/or economic targets.

“We have not produced so much that we can sell in the market, as we only eat what we get from our gardens.”

—FGD, Gashihe Village, Twumba Sector, Karongi District

“Generally, the production of our home garden crops is very good, but it is not sufficient in quantity. Of course, we need to increase the quantity of home garden crops we’re selling because we need a lot of money to help address other family needs, for example to buy cattle to produce fertilizer.”

—FGD, Rugwiza Village, Rugendabari Sector, Muhanga District

“Our only challenge is that our production is still not sufficient. We want training that goes deeply into agriculture and more information concerning which seeds are good for our soil.”

—FGD, Karongi District Gashari Sector Mwendo Cell Kabageni Village

“Most of [the families managing home gardens] consume the produce, but they don’t take care of their gardens properly so they get inadequate harvests, which leads them to eat it all, leaving nothing to sell.”

—KII, Agronomist, Gashari Sector, Karongi District

Seasonal Variation

Despite seasonal resilience strategies that the EKN program promoted to permit year-round production, several survey respondents indicated that productivity slowed substantially in the home garden during the dry seasons. The difficulties experienced by households during the dry seasons, as well as the positive feedback received concerning productivity of home gardens when certain BIATs are employed, suggest that not all households are employing the techniques best suited for their land.²⁹

²⁹ The BIAT techniques promoted by the EKN program take seasonal variability into account and encourage the use of inputs designed to withstand the challenges of dry seasons.

“The production can be good, but it depends on the time and season.”

—FGD, Uwiraro Village, Mutuntu Sector, Karongi District

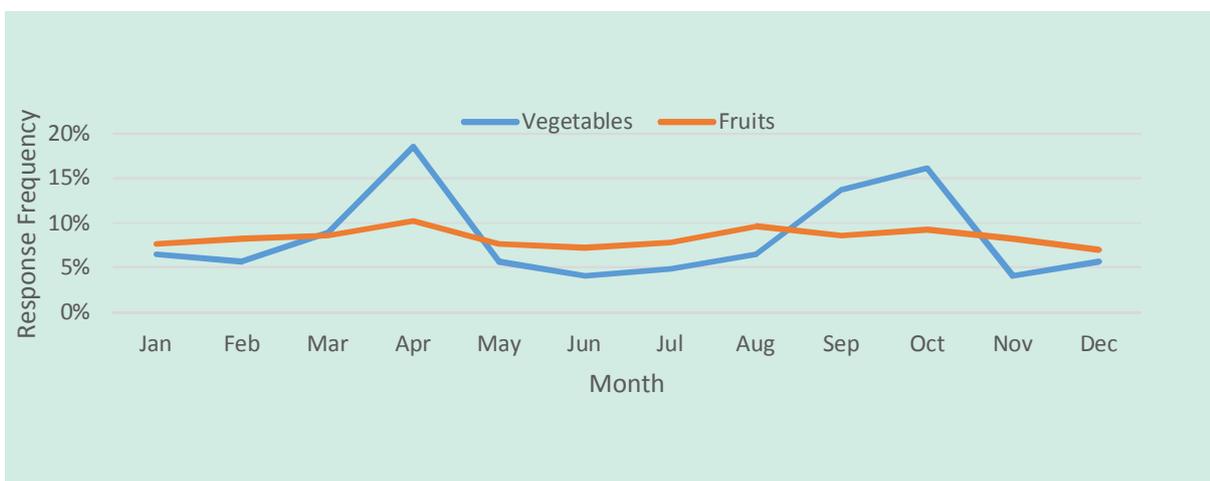
“During the season of the sun, the production is not good.”

—FGD, Musenyi Village, Kiyumba Sector, Muhanga District

“When the harvest is high, we have to sell vegetables. During the season of the sun, vegetables are very needed in the market, but in the rainy season everyone can access to them.”

—FGD, Musenyi Village, Kiyumba Sector, Muhanga District

FIGURE 7: CROP PURCHASES BY MONTH



Survey respondents were asked to report the months when fruits and vegetables were purchased for consumption in the past 12 months to indicate how directly seasonal productivity impacted households’ need to purchase complementary foods in the marketplace. Fruits were purchased relatively consistently, with minor peaks during April and August. Respondents were much more likely to report the purchase of vegetables during the April, September and October months (see Figure 7).

These peaks correspond to Rwanda’s rainy seasons, with the big rains from mid-February to May and the lighter rains from mid-September to December, also known as the “hungry season,” when crops are not available because they are growing in the fields.

Economic Priorities and Opportunities

For the economic strengthening activities of the EKN program, CRS built on its experience in SILC groups. To facilitate community access to credit, CRS/Rwanda helps community members to form SILC groups to pool their savings and make loans to each other. SILC groups (15-25 members per group) are user-owned, self-managed savings and credit groups that are accessible, transparent and flexible. The SILC model offers poor households safe and frequent opportunities to save in the convenience of their own community. It helps members build lump sums that become available at a pre-determined time, and allows them easy access to small, flexible loans or emergency grants.³⁰ In addition to their financial benefits, SILC groups strengthen the social bonds between members and contribute powerfully to Integral Human Development (IHD).³¹ In the context of the EKN Project, membership in SILC groups was open both to women and men of households of PLW and CU2.

CULTURE OF SAVING

SILC groups provide an important option in terms of providing a safe and reliable savings mechanism to work towards investment and growth goals; however, only **6.6% of survey respondents reported using income generated from home produce sales to make SILC group contributions**. This finding suggests there is room to reinforce a culture of savings and encouraging community members to recognize sales from home garden produce, particularly the surplus, as an income stream that can be added to SILC contributions.

“We prefer to save the profit in SILC for buying cattle which will help the community to get fertilizer.”

—FGD, Rugwiza Village, Rugendabari Sector, Muhanga District

“We save the money in [SILC] groups so that we can get health insurance tomorrow.”

—FGD, Nyamushishi Cell, Murundi Sector, Karongi District

While ensuring the communities have access to savings and lending services at the community level, the most substantial economic strengthening effects from the home garden activities were the results of the increased agriculture production, especially in terms of reducing food expenditures and providing income from selling portions of the harvest.

³⁰ For more details on the SILC methodology, see CRS' Savings & Internal Lending Communities Field Agent Guide, by Guy Vanmeenen and marc bavois, Version 4.1, September 2011.

³¹ Vanmeenen, Guy. Savings and Internal Lending Communities (SILC): A Basis for Integral Human Development (IHD). Rep. Catholic Relief Services, Oct. 2006. Web.

REDUCTION IN FOOD EXPENDITURES

One of the most straightforward economic benefits of home gardens is the reduction of household food expenditures. In fact, over one-fifth of survey respondents reported that they **did not need to purchase any fruits or vegetables during the past year**. Many families that were unable to produce enough to sell in the marketplace reported being satisfied with the yields that their respective home gardens observed, as the funds saved on food could be spent on other household expenses.

Post-Harvest Handling

Households frequently reported producing surplus produce, which was then either sold in the marketplace or given to neighbors. In terms of reducing household food expenses, there is significant interest in developing capacities to process and preserve crops that are unable to be immediately consumed.



*Therese Umuhire holds onto the goat she bought to provide her garden with organic manure. Eventually, she plans to sell baby goats for additional income
Photo by Laura Elizabeth Pohl*

“When the production quantity is high, our family cannot consume all of the harvest. Carrots and cabbages cannot be stored for a long time, so we sell them in the market.”

—FGD, Ryakiyange Village, Nyabinoni Sector, Muhanga District

“We sell because we have produce what we can’t eat and finish. That’s why we decide to sell our crop on the market.”

—FGD, Uwiraro Village, Mutuntu Sector, Karongi District

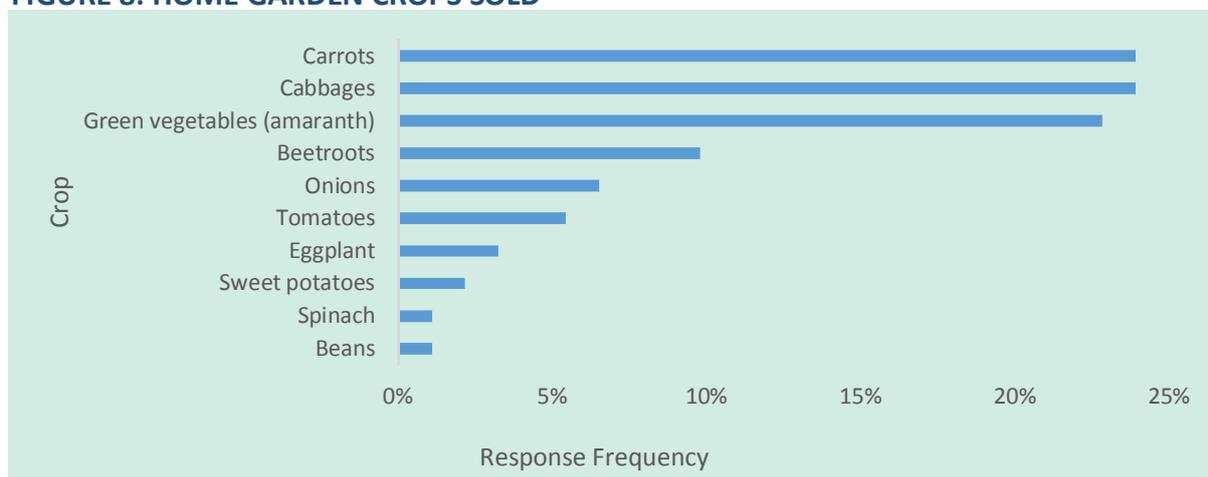
“[We need training] on keeping the yield in post harvesting period and how to process the harvested crops so that it can be kept for a longer period.”

—KII, FFLS Coordinator, Murengezo Village, Mutuntu Sector, Karongi District

SALE OF HOME GARDEN PRODUCE

Depending on the productivity of the home garden and especially when surpluses are produced, households will decide to sell their produce once household nutrition needs are met. In the survey, 48.0% of households had sold at least a portion of their home garden produce in the last season. Crops that were sold in the highest frequencies were cabbage, carrots, and green vegetables (amaranth), which constituted 70.7% of crops sold (see Figure 8). When households decided to sell portions of their produce, an average of 42.2% of the harvested crop was sold on the market.

FIGURE 8: HOME GARDEN CROPS SOLD



The reasons households cited for selling their produce were relatively consistent throughout the sample. Dealing with a surplus to prevent spoilage was the most commonly cited reason (47.3%) for selling produce. Financial needs and high profit opportunity were listed as the second and third reasons, with food and taste preferences being the least common explanations (see Figure 9).

FIGURE 9: REASONS FOR SELLING PRODUCE



INCOME UTILIZATION

Of respondents that reported earning income in the last harvest season, an average of 7.46 USD was earned while 14.6% families reported having earned over 18.36 USD over the course of the season.³²

Households that generated income from the sale of home garden produce reported spending a little less than half of the total income on complementary foods. This provides an important insight into household behavior, as the primary reason to sell the produce was due to surplus from the harvest. In the absence of urgent financial obligations, households use the money to purchase food (see Figure 10).

Respondents reported small fish, peanut butter, porridge, milk, salt and oil as being the most frequent food purchases made with home garden proceeds. Some of these purchases will support the nutrition pathway by providing income to purchase complementary foods, while the others will serve to subsidize expenditures on regular household purchases (i.e., cooking oil and salt).

FIGURE 10: USES OF INCOME FROM HOME GARDEN SALES

Reported Income Use	Frequency
Food purchase	35.5%
Agriculture activities ³³	18.4%
Household assets	15.8%
SILC group contribution	6.6%
Non-SILC IGA	6.6%
Health-related expenses	6.6%
School fees	5.3%
Household improvements	3.9%
Clothing	1.3%

“Home gardens are on small land, but the harvest is great compared to the agriculture plots when households have taken care of their gardens. We are very interested in increasing the quantity of our home garden crops because we want to develop our financial status through selling our products.”

—FGD, Kabageni Village, Gashari Sector, Karongi District

“We want to increase the quantity of home garden crop because when we sell it, we get more money. We want to develop our livelihood and welfare.”

—FGD, Gasharu Village, Gitesi Sector, Karongi District

INVESTMENT IN GROWTH

Beyond the purchase of food, the second most common use for funds earned from the sale of home garden produce is investment in income-generating activities—agriculture farming, SILC group contributions, and non-SILC income generating activities constituted a combined 31.6% of the income utilization.

³² Monetary amounts converted using 1 USD = 816.780 RWF, per exchange rate on 4 December 2016 (OANDA FX Rates).

³³ ‘Agriculture activities’ includes the purchase of inputs, payments for labor, and purchase of animals for manure.



A woman counts money at a SILC meeting in Buruba Village, Muhanga District / Photo by Laura Elizabeth Pohl

Participants in the study expressed a consistent and strong interest in improving agricultural productivity to support the economic strengthening of the household. Discussions with key informants and focus groups repeatedly commented on the need to increase the adoption of BIATs so that productivity remains strong throughout the year and that more income can be earned during each harvest.

Nearly all the challenges associated with income generation involved agricultural input constraints. Irrigation (lack of water, tools, and skills) topped the list of productivity challenges experienced by households, with 68.3% of households citing irrigation as a major challenge.

“Crops on the market have a value because people know that vegetables like beetroots and amaranth are very nutritious.”

—FGD, Bucyeye Village, Cyeza Sector, Muhanga District

“We need to improve the market for sweet potatoes fortified with Vitamin A.”

—FGD, Bucyeye Village, Cyeza Sector, Muhanga District

“The high abundance of home garden quantity on a small market is a challenge. To find drugs for killing parasites and pests is another challenge. There is not enough fertilizer and it is difficult to find water.”

—FGD, Kagwiza Village, Rugendabari Sector, Muhanga District

“With the help of local leaders, people need enough land space for planting. They need some tools and equipment for use in storing their harvests and trainings on food processing.”

—KII, Nutritionist, Muhanga District

Discussion and Recommendations

The main objective of this study is to better understand families' decisions to consume or sell the crops harvested from their home gardens in Rwanda. The factors contributing to household decisions to consume or sell agriculture produce are complex and varied. From an economic perspective, one would hypothesize that a household would compare the costs associated with purchasing a product from the marketplace versus those costs associated with consuming something produced in the home garden.³⁴ In a perfect economic analysis, these costs would include an accurate valuation of time and labor required to produce an item for sale, real-time market price information, and even an accurate quantification of the health benefits associated with consuming nutritious foods.

As expected, the household decision to consume or sell home garden produce cannot be reduced to a simple equation. Instead, the choice is largely driven by consumption and income generation requirements of each respective household, as well as other cultural factors such as decision-making patterns and gender power dynamics. Despite the inevitably unique circumstances in each household, certain themes emerged from the study.

FINDING 1: HOME GARDEN PRODUCE IS PRIMARILY CONSUMED AT THE HOUSEHOLD LEVEL

The finding that home garden produce is almost categorically consumed at the household level is consistent with the EKN program's intentions. Crop variety decisions in production largely predicted crop variety in consumption decisions. Key informants and focus groups both commented with enthusiasm that the home gardens improved the nutritional status of children and adults in target communities. Interview respondents estimated that anywhere from 50-100% of village residents were familiar with home garden techniques and the importance of dietary diversity in target areas.

Recommendation: Continue nutrition education behavior change activities

To reduce the likelihood of home garden produce being sold exclusively for profit without first being provided to family members, nutritional SBCC activities must continue as a key element of CRS' home garden programming. Trainings must continue with both men and women to address the patterns of access and control, as well as decision-making; targeting households (including men) reduces the burden on women to be the sole nutritional guardians for the household and extends responsibilities to other members.

Providing education about the value of nutrient-dense foods encourages households to appropriately value the health benefits associated with consuming nutrient-dense crops when making consume-or-sell decisions. Including men in these trainings is especially important, as CRS has recognized in its nutrition programming that activities exclusively targeting mothers may not achieve the full intended impacts because men are often the decision-makers surrounding household finances, thus perhaps inhibiting adoption of promoted behaviors. Supporting the increased market demand for bio-fortified foods through public campaigns and SBCC activities, especially in rural areas where markets remain relatively undeveloped, would make the decision for households to plant new, healthier varieties in the gardens less risky. Higher demand means more buyers willing to absorb potential household production surpluses.

³⁴ Kiess, L., M.W. Bloem, S. de Pee, et al. 1998. "Bangladesh: Xerophthalmia Free. The Result of an Effective Vitamin A Capsule Program and Homestead Gardening." [abstract] In American Public Health Association 126th Annual Meeting Report, November 15-18, Washington, DC. p. 361.

Recommendation: Improve post-harvest handling

When households experience a productive harvest, families are often obligated to sell the surplus to prevent spoilage and waste. Households benefit from these sales; however, it precludes the option of consuming the food at home. Improving post-harvest handling techniques for households could further reduce household food expenditures and increase food security, as harvests that surpass a family's consumption capacity could be preserved and consumed (or even sold for a good price) in between harvest seasons. CRS should incorporate trainings on contextually feasible post-harvest handling techniques in future home garden programming.

Simple, cost-efficient techniques that CRS can promote in households to preserve harvests include:

- Use of jerry cans to store beans so insects cannot access and spoil surplus harvest.
- Employ Purdue Improved Crop Storage Bags (PICS) to store and protect grain.³⁵
- Process sweet potatoes into flour for storage or transformation into marketable products, such as muffins or donuts.

FINDING 2: HOME GARDENING, PARTICULARLY THE SURPLUS, IS A SOURCE OF INCOME

Once household nutrition requirements are met, households are interested in earning as much money as possible via the sale of surplus produce to help cover other planned and unexpected household expenses. A significant majority (91.9%) of households' primary source of income in this study is farming. Increasing household income by improving home garden productivity offers an accessible avenue for families to improve their standard of living and quality of life.



Alfred Sugira, left, and his sister Valentine Umuhoza, right, play on the grass in front of their home / Photo by Laura Elizabeth Pohl

Recommendation: Increase training on agricultural productivity and BIATs

Although FFLS group members expressed satisfaction with the techniques being promoted, a significant portion of beneficiaries reported producing only enough to partially meet household requirements, with nothing left to sell. More extensive and technical agriculture trainings using BIATs were common requests during FGDs and KIIs, and the household survey data supports these priorities (see Figure 11). Irrigation support was identified as a priority. Methods for producing organic fertilizer and organic pest control were included among techniques promoted by Farmer Promoters through the FFLS groups, but still appear as challenges, suggesting the need for more effective sensitization (such as Training of Trainers with Farmer Promoters and community FFLS trainings) and/or closer follow-up in demonstrating these techniques.

³⁵ Feed the Future Partnering for Innovation. "It's in the Bag: The Story of Purdue Improved Crop Storage Bag (PICS)." AGRILINKS. Feed the Future, 8 Jan. 2016. Web. 18 Oct. 2016.

Recommendation: Support agriculture and business planning activities

Access to inputs was one of the most commonly reported challenges faced by farmers affecting crop productivity. CRS should work with partners to develop households' abilities to forecast their seasonal agriculture input requirements and develop strategies to ensure their ability to meet those requirements. A fundamental component of effective BIAT techniques is uninterrupted access to BIAT technologies throughout the year, including during dry seasons.

Future programs should support households' ability to forecast their input and financial needs for upcoming seasons and to make the necessary preparations, which may involve the selection of specific produce crop varieties to plant depending on the season and consistent fertilizer preparation. In addition to trainings and accompaniment concerning agriculture planning, opportunities emerged in the study to **strengthen synergies between SILC groups and Farmer Promoters**, in order to ensure access to needed inputs and to help recover from financial shocks.

Recommendation: Develop local market demand for nutritious produce

Beyond urban and peri-urban marketplaces, the demand for nutritious vegetables in Rwanda remains underdeveloped. Farmers cited the main difficulties in selling home produce as getting fair prices and finding strong markets. 39.1 percent of surveyed farmers sell home garden produce directly from the farm gate, while the second most popular selling point is at the local market (36.8%). Families may be reluctant to grow nutrient-dense crops if there is no accessible (local) market where surplus can be sold.

To improve the availability of nutritious foods in the marketplace, local producers must be motivated to grow them. Continuing nutrition and food preparation education, such as cooking demonstrations and SBCC activities in communities and schools, can contribute to increased demand, as can training in food processing activities, which require a continuous supply of nutritious inputs for production. Messages can include campaigns to valorize nutritious crops, such as the iron-rich beans or maize, in creative ways. Further market analyses would be required to make more specific recommendations concerning community-specific market access and opportunities, but there may be opportunities to organize the home garden producers and help connect them to aggregators or private sector traders to promote increased income.

FIGURE 11: PERSISTENT CHALLENGES FOR HOME GARDENS

Challenges	Frequency
Irrigation (lack of skills, water, tools)	68.3%
Fertilizer	29.7%
Seeds	18.8%
Pesticides	11.9%
Small land	8.9%
BIAT knowledge	4.0%
Market access	3.0%
Personal conflicts	2.0%

Conclusion

In Rwanda, the GOR and local authorities support the home garden as an effective approach to address childhood malnutrition and to improve the financial standing of rural and peri-urban households. The study indicates that households use home garden produce, as well as proceeds from the sale of home garden produce, to support nutritious and balanced meals for family members. When household consumption and nutrition requirements are satisfied, produce is sold to cover other expenses or sometimes to save for future investments. Regardless of their respective individual productivity, almost all participants interviewed and surveyed hope to improve their home garden productivity and are interested in participating in programs aimed at improving agricultural productivity.

Based on the study findings, CRS' home garden methodology successfully promotes food security and nutrition at the household level in the context of ongoing nutrition education and awareness campaigns targeting both men and women. In order to maximize the effectiveness of home garden interventions, CRS/Rwanda programming should continue emphasizing SILC and BIATs, while also incorporating capacity building activities on agriculture and home garden input needs forecasting, post-harvest handling and storage strategies, and transformation techniques at the household level.



*Target beneficiary of CRS' EKN program participating in a regular growth monitoring visit to ensure healthy nutrition levels
Photo by Michael Stulman*

Appendices

- A. Terms of Reference
- B. Household Survey Questionnaire
- C. Focus Group Discussion Guide: FFLS Participants
- D. Key Informant Interview Guide: Local Partner Project Staff/Local authorities

TERMS OF REFERENCE

A Mixed-Method Study on the Use of Home Garden Produce EKN Project/CRS Rwanda

Project Description

The EKN project is a three-year project, funded by the Embassy of the Kingdom of the Netherlands in Rwanda through UNICEF, implemented by CRS and its local partners Caritas Kabgayi and EPR, which aims to accelerate reduction in stunting rates in under-two children across Rwanda. This is to be accomplished through an integrated approach to addressing child chronic malnutrition, which includes activities to improve maternal, infant and young child nutrition (through Village Nutrition Schools and strengthening the capacity of the health system to mount a response); promote household economic strengthening (primarily through Savings and Internal Lending Community (SILC) groups); and disseminate enhanced agricultural practices (Bio-intensive agriculture techniques) to increase the agricultural production on small arable spaces and improve overall food security (through Farmer Field Learning Schools-FFLS). The project began in 2013 and is scheduled to end in 2016, leaving less than one year of implementation remaining. CRS is the lead EKN implementing partner for two districts: Muhanga and Karongi, both of which have high stunting rates.

Context for Study

Promoting bio-intensive agriculture techniques³⁶ (BIATs) within FFLS is a key approach under EKN. In the beginning of the project, CRS conducted a Training of Trainers on the Farmer Field Learning Schools approach and bio-intensive agriculture techniques (BIATs³⁷) for districts and sector agronomists. These trainees then trained community health workers and farmer promoters on the approach and BIATs. Community health workers then grouped the households into FFLS groups, consisting of pregnant and lactating women (PLW) and caregivers of CU2. Each FFLS group received agricultural tools and seeds for vegetables and bio-fortified crops (orange-fleshed sweet potato rich in Vitamin A and beans rich in Iron) which were then used in the demonstration plot established in each village. The FFLS members learned the new BIATs by implementing them in the demonstration plots, and then received technical support to establish their home gardens using the new techniques on their own.

After the first two years of implementation, however, CRS has conducted no systematic analysis on whether and through what pathway nutrition-sensitive agricultural interventions (in this case, home gardens) may be contributing to improved nutritional status of the beneficiaries. More specifically, there is a lack of information on how the products of the established Kitchen Gardens and other BIATs in the home gardens are being used; whether and to what extent the home garden crops being produced are contributing to household dietary diversity, household income, or both.

³⁶ The Bio-Intensive Agriculture system refers to the use of organic inputs (compost manures, organic liquid manures and pesticides) and agricultural tillage techniques (double dug bed, sunken bed, kitchen garden, Mandala garden, container garden) that allow the increase of agricultural production on even small plots of land.

With these evidence gaps in mind, CRS will conduct a study which will assess household practices around home garden-produced crops. The study will provide information about the crop varieties cultivated in the home gardens, which crops have been consumed in the households or sold and the reasons behind the decision to consume or sell. The study also aims to assess community-level interest in bringing home garden crops to market and the contribution of sale incomes in the nutrition of HH members.

Consume or/and sell: Possible pathways to improved nutrition

Agricultural production affects nutrition outcomes most directly by allowing for increased caloric intake and improving diet quality and diversity. Households that produce sufficient food for their own consumption are more likely to ensure acceptable household food and nutrient consumption. This is, indeed, the rationale for the home garden with BIATs: that small-scale, bio-intensive agricultural production can directly generate inputs for the family's daily diet. However, consumption is not the only option; sale of produce of home garden may be appealing and advantageous to individual households for different reasons.

We hypothesize that there are two main pathways through which home garden produce that is sold by beneficiaries for profit (rather than consumed within the household) may indirectly produce improved nutrition and maternal and child health (MCH) outcomes: **(1) by allowing for the direct purchase of nutritious food within local markets; and (2) by providing income for either pre-planned or unexpected healthcare and medical expenses.**

(1) Income generated by kitchen gardens can be directed towards the purchase of nutritious food for the family, which can help to improve caloric intake and diet quality. There are several outside factors which may limit the household's ability to do this, however: The ability to sell one's home garden produce may depend on an available local market, the demand for certain varieties of produce, and a seller's ability to produce and market his/her home garden produce. Furthermore, the ability to purchase nutritious food with home garden profits depends on the quantity, quality and price of food accessible at local food markets, in addition to household income allocation dynamics.

(2) Alternatively, when allocated to non-food expenditures that are related to healthcare (i.e., used for purchasing health insurance or paying health consultation fees), home garden incomes are also likely to be associated with greater access to healthcare and reduced illness within the family. Preventative consultations and prompt diagnoses can reduce overall household expenses. In this way, expenditures on health care indirectly contribute to household nutritional status. Again, however, there are several outside factors which may limit or prevent a household's investment in healthcare expenses. Incomes generated from agricultural production may not always be allocated toward health care; for example, families may decide instead to purchase non-essential goods or other household assets with their profits.

There is no information available about actual practices or use of these incomes. This study will generate both qualitative and quantitative data on how food produced in the kitchen gardens are actually used and will allow us to understand better the mechanism by which home gardens may in fact contribute to improving nutrition and health outcomes.

The results of this study will help to more clearly identify pathways to improved nutrition supported by home gardens practices promoted through the EKN project and to identify potential barriers to small-scale, local market linkages.

Study Objectives and Questions

This research has the following overarching objectives:

1) Assess how the products from the kitchen gardens and other BIATs established in the home gardens are used by EKN beneficiaries;

2) Assess household decision-making factors around the use vs. sale of kitchen garden and other BIATs produces Assess beneficiary interest in adding market linkage component to the home gardening component.

1. What percentage of home garden production is consumed in the beneficiary household, and by whom?
2. How often are home gardens' produce fed to the children under two in the household?
3. How often are home gardens' produce consumed the pregnant and lactating women in the household?
4. How often are home gardens' produce consumed by the other members of the household?
5. What percentage of home gardens' produces is sold in the market?
6. Which specific types (varieties of crops) of home garden produces tend to be sold? And why?
7. What factors contribute to the decision to sell all or some home garden produce or consume them in the household?
8. When is the decision to sell a crop or consume it made? Does this occur categorically before planting (i.e., certain types of crops are always sold) or do circumstances determine what the family will do with the crops?
9. How is the decision to sell home garden produce made? In consultation between the man and woman or one of them take the decision unilaterally. Who make the decision?
10. To what degree are beneficiaries interested in marketing their KG crops better? What types of training and support are needed to assist beneficiaries wishing to bring some of their home garden produces to market?
11. Once the produce is sold, how does the household use the income?

Proposed Methodology

The research questions will be explored using a participatory, mixed-method approach with both quantitative and qualitative elements. Three main research methods will be used:

(1) Surveys:

The survey questionnaire will be administered to the household beneficiaries of the project: members of FFLS/SILC groups who actively maintain their own home gardens. These beneficiaries will provide information about household consumption of garden produce, sales of home garden produce, and general dietary trends of the household.

Surveys will be done with a minimum of 50 households in each district (this target may be higher based on the implementing partners' estimation of households adopting kitchen gardens, but 50 is a feasible minimum starting point). With regards to sampling, the team will randomly select 5 sectors per district to visit, and will thus interview 10 "adopters" (households with an active home garden) in each sector; the community-level staff in the selected sectors will be able to provide information about which households in their sectors are maintaining their gardens.

Survey responses will be recorded on paper by the data collectors (CRS/IP interns), entered into Excel, and analyzed.

(2) Focus groups:

The study aims to conduct a total of twelve structured focus group discussions of 10-12 participants each. Six villages in Muhanga and six villages in Karongi will be selected randomly for these discussions.

- Six of these groups (three per district) will include pregnant, lactating mothers and caregivers of children under two years—the beneficiaries of the EKN project.
- Six groups (three per district) will include the male Heads of Households with children under two years old or a pregnant, lactating woman.

(3) Key Informant Interviews

Key informant interviews will be held with the following individuals, to diversify and enrich the perspectives included in this study.

- **CHWs/Farmer Promoters:** The study will aim to interview at least 6 CHWs, due to their continuous coordination and support of the activities related to the agriculture in the community and their direct involvement in BIATs promotion. As they are based in the community, they are well-placed to observe trends in household-level practices around home gardens. Where available, we will also interview the Farmer Promoters to understand their perception of uptake of BIATs.
- **EKN Project staff:** Local partner staff from Caritas and EPR work directly with beneficiaries on a daily basis and have clear insight into the realities of implementation of the BIATs. The study will aim to interview 2 project staff per district, which may include project managers, nutritionists and nutritionists. The questionnaire will aim to examine their observations and perceptions of the use of the home garden products and existing factors that contribute to those practices.
- **Local leaders:** Where available, we will aim to interview district, sector and village authorities as well. Their observations might reflect practices and trends throughout the community, and have insight into larger policy and economic implications for the project.

Surveys, FGDs and KIIs will be carried out in the field over the course of about two weeks, facilitated by a team of CRS and IP staff and interns. FGDs will be moderated by a staff member with two note takers. FGDs will take place in Kinyarwanda and will be translated, while KIIs may be carried out in Kinyarwanda, English or French, depending on the preferred language of the interviewee.

Once the qualitative and quantitative data have been collected and all FGD and KII notes compiled and transcribed, quantitative data will be tabulated and summarized, and for the qualitative data, content analysis will be used to code for recurring themes and trends, as well as examine any divergent viewpoints. By examining trends of home garden use, best practices, and opportunities for improvement, we will then be able to recommend improvements to the program and identify programmatic strengths to build on further.

Ethical Considerations

Verbal informed consent will be obtained from all respondents prior to participating in interviews and FGDs.

Dates of Study

To be completed in June 2016.

Responsibility

The CRS/EKN team, with the support of implementing partners (Caritas and EPR), will lead the study, including developing TOR and questionnaire tools; carrying out data collection; analyzing the data; and producing a study report including recommendations, in addition to developing any communications materials to highlight results or identified success stories.

Support and feedback will be provided by the EKN team including the EKN Director and MEAL Officer.

HOUSEHOLD SURVEY QUESTIONNAIRE

QUESTIONNAIRE

Household Practices on Consumption Versus Sale of Home Garden Produce

Questionnaire Number: _____

Date of Interview: _____

I. PARTICIPANT IDENTIFICATION

1	Name:		ID:
2	Province:		
3	District:		
4	Sector		
5	Cell:		
6	Village:		
7	FFLS Group:		

II. HOUSEHOLD CHARACTERISTICS

		Response	Codes
8	Name of respondent:		
9	Name of household head:		
10	Age of household head in years		
11	Sex of household head		
12	If the head is male, how many months of the year does he live with the household?		
13	Highest level of education of Household head:		
14	Marital status of household head:		
15	Main occupation of household head:		
16	Household size (total number of HH members):		
17	Number of household members who provide field labor:		
18	Number of years household has been farming using Bio-intensive agriculture techniques (including Kitchen Garden):		
19	Number of children under two years of age in household:		

III. KITCHEN GARDEN PRACTICES

20. Does this HH have a garden established using BIATs including Kitchen garden with active produce?

1=Yes

0=No

21. What different crops are commonly grown in your gardens? (*List all*)

22. Which of these crops does your family consume in your household? (*List all*)

23. How many times per week do adults in your HH consume produce from your garden?

1) *Daily*

2) *At least 3 times per week*

3) *At least once per week*

4) *Less than once per week*

24. What types of crops from your garden are fed to your children under two years of age? (*List all*)

25. How many times per week do children under two in your household consume produce from your kitchen garden?

1) *Daily*

2) *At least 3 times per week*

3) *At least once per week*

4) *Less than once per week*

26. Yesterday, how many times did the children (<2 years old) in this household ate meals that contained products from your garden?

1) *0 times*

2) *1 time*

3) *2 or more times*

27. Does your garden include bio-fortified foods (beans rich in Iron, maize rich in proteins, orange fleshed sweet potatoes rich in Vitamin A)?

1) *No (skip to 28)*

2) *Yes (ask 27a)*

27a. How many times per week do you consume bio-fortified foods (beans, orange fleshed sweet potatoes) from your garden?

1) *Daily*

2) *Less than once per week*

3) *At least once per week*

4) *Never*

5) *N/A*

28. Last season, where did you get seeds/seedlings for fruits and vegetables? (*list*)

29. Which varieties do you grow in your home garden? (*list*)

30. Did you sell any fruit/vegetables from your home garden in the last season?

0) *No (skip to 43)*

1) *Yes (ask 31)*

31. Which crops do you sell? (list all)
32. (For each crop sold) Why did you decide to sell this particular crop? (circle all that apply)
- 1) *Could earn high profit from this crop*
 - 2) *My family does not eat/does not like these crop*
 - 3) *Produced surplus of this crop*
 - 4) *Needed money for a particular situation (medical emergency, school fees, etc.)*
 - 5) *Other (list)*
33. (For each crop sold) For these crops sold what portion of the production did you sell?
- 1) *All of it / 100%*
 - 2) *Most of it / 75%*
 - 3) *About Half / 50%*
 - 4) *Less than half*
34. What do you use this income for?
- 1) *Food purchase*
 - 2) *School fees*
 - 3) *Health related expenses*
 - 4) *Agriculture/farming e.g. renting land, buying seeds, manure or other inputs, etc.*
 - 5) *Household improvements (fixing house, building roof, etc.)*
 - 6) *Household assets*
 - 7) *Others (list)*
- 35.. What proportion of financial income from your home garden do you use to purchase complementary foods for your household?
- 1) *All of it / 100%*
 - 2) *Most of it / 75%*
 - 3) *About half / 50%*
 - 4) *Less than half*
 - 5) *0%*
36. If you sold any HG crops last season, please estimate how much income you earned in RWF?
37. Where do you usually sell your kitchen garden produce? (Circle all that apply)
- 1) *Farm gate*
 - 2) *Private traders*
 - 3) *Local market*
 - 4) *Local town*
 - 5) *Distant town*
 - 6) *Marketing boards*
38. How often do you sell your crops at a market? (Circle all that apply)
- 1) *At least weekly*
 - 2) *At least monthly*
 - 3) *At least quarterly*
 - 4) *Occasionally/only when needed*
 - 0) *never*

39. Did you face any difficulty during sales of your products?

- 1) *Yes*
- 2) *No*

40. If yes, what was the cause?

- 1) *Too much competition at market*
- 2) *Quality of produce was poor*
- 3) *Post-harvest handling*
- 4) *Pricing issues*
- 5) *Marketing*
- 6) *Other (describe below)*

41. How satisfied were you with the profit you made from HG produce that you sold last season?

- 1) *Very Satisfied*
- 2) *Satisfied*
- 3) *Dissatisfied*

42. Do you feel that there is a better market than where you sold?

- 1) *Yes*
- 2) *No*

42a. If yes, why?

43. In the last 12 months, did your household have to buy fruits and vegetables to eat?

- 1) *Yes*
- 2) *No*

44. In the last 12 months, which months did you buy fruits and vegetables? (circle all that apply)

Months during which you bought fruits

<i>JANUARY</i>	<i>MARCH</i>	<i>MAY</i>	<i>JULY</i>	<i>SEPTEMBER</i>	<i>NOVEMBER</i>
<i>FEBRUARY</i>	<i>APRIL</i>	<i>JUNE</i>	<i>AUGUST</i>	<i>OCTOBER</i>	<i>DECEMBER</i>

Months during which you bought vegetables

<i>JANUARY</i>	<i>MARCH</i>	<i>MAY</i>	<i>JULY</i>	<i>SEPTEMBER</i>	<i>NOVEMBER</i>
<i>FEBRUARY</i>	<i>APRIL</i>	<i>JUNE</i>	<i>AUGUST</i>	<i>OCTOBER</i>	<i>DECEMBER</i>

45. What is the *most important* benefit you have experienced with the KG? (list)

46. What are the challenges you are experiencing? (list)

47. Who is primarily responsible for distribution of food to family members within your household?

- 1) *Mother*
- 2) *Father*
- 3) *Other*

48. Does the household keep livestock?

- 1) *Yes*
- 2) *No*

49. Which animals do you raise? Circle all that apply.

- 1) *Cow*
- 2) *Pig*
- 3) *Goat*
- 4) *Sheep*
- 5) *Poultry*
- 6) *Rabbit*

50. How many times per week does your household consume animal proteins (eggs, meat, milk) from your livestock?

- 1) *Daily*
- 2) *Less than once per week*
- 3) *At least once per week*

51. Is there any additional information you would like to add?

Thank you!

FOCUS GROUP DISCUSSION GUIDE: FFLS PARTICIPANTS

Explanation and Goal

Hello everyone, my name is _____ and this is my colleague _____. We are part of a team from Catholic Relief Services. We have organized community focus groups to help us to understand better your experience developing kitchen gardens. We appreciate the opportunity to learn from your experience.

Thank you for agreeing to participate in the group today. I will pose a question to the group, and then facilitate the sharing of your opinions on the topic. We are not here to give our opinions, but are only interested in hearing yours. There are no right or wrong answers; you can agree or disagree with the points others make, or even change your ideas during the discussion. We hope you will feel at ease to share your experiences and perceptions, and to speak honestly about how you feel. We hope to hear from everyone in the room. My colleague is going to record our discussion today so that we can remember all of the opinions that are discussed and not miss any important ideas. However, I'd like to reassure everyone that this group discussion is confidential; no one outside the group will be able to know who said what, and your name will not be attached to any comments you may make during our discussion.

Please do not hesitate to respond to a question posed; you do not need to wait to be called on, but please allow the person who is speaking to finish their thought before starting to speak. It will be much easier to follow the discussion if only one person speaks at a time. Please be respectful of all viewpoints and remember not to share anything that is said today with others.

Your participation in the group is completely your choice, and you can choose not to answer a question, or to stop participating and leave the group at any time, with no consequence to you.

Does anyone have any questions?

Are you willing to participate in this research? (*ensure verbal consent of all participants*)

So that we all know each other, can we start by going around the circle and sharing your name?

Objective 1: Assess how crops produced in Kitchen Gardens are put to use by EKN beneficiaries

- 1) To begin, I'd like to know how your kitchen garden experience has been so far. How would you characterize the production of your kitchen garden crops? Has it been good, bad, somewhere in between? Why?
- 2) When your kitchen garden produces crops, what is your preference for what to do with this produce (*probe: Consume? Sell? Both?*)
- 3) When you consume the kitchen garden produce, who in the household eats the kitchen garden crops and how often? Why?
PROBE: Do you believe this consumption has improved the nutrition status of your household? Why or why not?
- 4) When you sell your kitchen garden produce (or if you were to sell it), what did you/(would you) like to use the profits for? Why?
PROBE: Do you believe selling your produce has improved the nutrition status of your household? In what ways?
What would be the advantages of bringing some of the kitchen garden produce to market?

Objective 2: Assess household decision-making factors around the use vs. sale of kitchen garden crops

- 5) What makes you decide whether or not you will consume a crop within the household or sell it at the market? *PROBE: market value of crop, taste or preference for consumption, economic circumstances, partner's decision?*
- 6) Who in the household gets to decide whether a kitchen garden crop will be sold or consumed? Why?

Objective 3: Assess beneficiary interest in adding market linkage components to the Kitchen Garden approach

- 7) How interested are you in increasing the quantity of kitchen garden crops you're selling locally? Why?
- 8) What are the main challenges or barriers you face (or would you face) in trying to bring some of your kitchen garden produce to market?
- 9) What ideas do you have about how CRS could help members of your group bring your KG crops to market? (*probe: specific training needed, most plausible markets to focus on*)
- 10) Do you have anything else you would like to mention?

KII GUIDE: LOCAL PARTNER PROJECT STAFF/LOCAL AUTHORITIES

Date:

Name of Interviewer:

Introduction: Thank you for agreeing to talk with me today. We are carrying out a study to help better understand the strengths and weakness of Kitchen Gardens, and how planters are using the fruits and vegetables they plant, particularly in the context of the EKN project. As a (*key implementing partner/staff member/local leader*), Your answers will help us determine how we can help planters get the maximum financial and nutritional benefits from their Kitchen Gardens.

I'm going to record our interview today, in addition to taking notes, so that I can remember all of your important comments, but your name or personal details won't be attached to anything you share with me. You can end the interview at any time or skip any questions you don't want to answer. Do you have any questions for me?

Are you willing to participate in this interview?

Can we begin by sharing your name, the name of your organization, and your official role within the EKN project? (record here):

Name: _____ **Organization:** _____ **Title:** _____

Objective 1: Assess how crops produced in Kitchen Gardens are put to use by EKN beneficiaries	
Questions	Response Notes
1) Please explain your familiarity and involvement with Kitchen Gardens in this community.	
2) In general, what is the level of knowledge and awareness in this community of Kitchen Gardens?	
3) Among households with Kitchen Gardens, do you notice any general trends about how their fruits/vegetables are being used? (Are more households consuming them, or selling them?)	
4) Which fruits/vegetables are being planted the most in the Kitchen Gardens of this community? Why do you think so?	
5) Who consumes Kitchen Garden fruits/vegetables most often in the household? (Adults? Adolescents? Children? Children under 2?)	

Objective 2: Assess household decision-making factors around the use vs. sale of kitchen garden crops	
Question Guidelines	Response Notes
<ol style="list-style-type: none"> 1) Which Kitchen Garden fruits/vegetables are being <i>sold</i> the most in this community? Why do you think so? 2) Which Kitchen Garden fruits/vegetables are being <i>consumed</i> the most often in this community? Why do you think so? 3) How do households decide to sell their Kitchen Garden fruits/vegetables? (Do they decide at the time of planting? Or does it depend on circumstances, later on?) 	
Objective 3: Assess beneficiary interest in adding market linkage components to the Kitchen Garden approach	
Question Guidelines	Response Notes
<ol style="list-style-type: none"> 4) For those selling their Kitchen Garden fruits/vegetables, what are their habits? (Where do they sell them, and about how often?) 5) Please describe the challenges or problems you have noticed Kitchen Garden planters face when they sell their fruits/vegetables. 6) Is there interest in increasing market linkages to household Kitchen Gardens in this community? 7) What types of training and support would be useful for Kitchen Garden planters who wish to sell their fruits/vegetables on the market? (Post-harvest handling, marketing, packaging, etc.?) 	





