AN AGRICULTURAL TRAINING MANUAL FOR THE GROWING PROJECT: A COLLABORATIVE APPROACH FOR DEVELOPMENT OF ADULT LEARNING RESOURCES

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ABSTRACT

Climate change poses challenges to local food systems worldwide, leading to greater food insecurity, disrupting rural livelihoods, and exacerbating existing gender inequities. Smallholder farmers are disproportionately affected by these challenges. Integrating nutritious, climate resilient crops into smallholder farming and food systems has potential for addressing food insecurity (especially among children and women of child-bearing age), vulnerability to the negative impacts of climate change, and rural household livelihood concerns. However, this approach requires new knowledge and extensive training related to nutrition, agronomic practices associated with new crops, and food marketing. This paper describes the processes, actors, key decisions, and outputs associated surrounding a new training manual for the Generating Revenues & Opportunities for Women to Improve Nutrition in Ghana (GROWING) project. It intended to serve as an instructive case study of the benefits and challenges associated with collaborative design and development of training programs and related learning resources. The paper explores the role of participatory and facilitative approaches in adult education and extension programs and emphasizes the importance of community-based extension agents (CBEAs) in facilitating learning, generating and disseminating knowledge, promoting self-reliance, and empowering fellow smallholder farmers. It examines the process for developing learning resources using a team-oriented and collaborative approach, addressing diverse needs of smallholder farmers and gender inequities.

The views expressed in this paper are those of the author, and should not be considered as representing of the views of GROWING project management or staff.
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<td>Community-based Extension Agent</td>
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<td>Council for Scientific and Industrial Research</td>
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<td>EAS</td>
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CHAPTER 1: INTRODUCTION

As agriculture systems around the globe become more complex, farmers will need to adapt so they can continue to provide food for their families, remain profitable and operate in the ever-changing environment. Local food systems worldwide are being challenged by climate change leading to food insecurity, low dietary diversity and increased malnutrition, especially for smallholder farmers and rural communities in the Global South. Particularly vulnerable are women and children who are not only impacted by the same climate shocks but also face other barriers leading to gender inequities.

One approach to tackling some of the challenges related to food insecurity is to introduce more nutritious crops, promoting options that are locally available and well-adapted to the community. For crops that are less commonly grown in the community, questions arise on how to produce them. Well-designed and skillfully facilitated extension and adult education programs can play a role in bridging this knowledge gap. Nutrition-sensitive approaches to farming system change require practical, learner-centered adult education activities that focus on multiple dimensions of change, e.g. agronomic practices (often associated with “new” crops), household food preparation and nutrition, and marketing/value chain development. Conventional public extension systems have been critiqued for many years for poor performance. Among the reasons cited for lack of impact are inattention to adult learning principles, poorly prepared and insufficiently supported extension staff, little involvement of local communities in priority setting and program design, and too little attention to the non-technical factors that factor into household decision-making and change. (Manfre, C., 2013). In addition, conventional, top-down EAS typically focuses more on commodity crops, typically grown by larger scale producers. By comparison, resource-limited,
small-scale producers, especially women, find limited access to high quality, relevant EAS. The acknowledgement that farmers are diverse, and that public EAS is poorly equipped to address diverse needs, has led to pluralism in extension and rural advisory services. A variety of actors, including local, national and international NGOs, large and small businesses, cooperatives, farmers’ associations and other membership organizations, project-based training and advisory units, and local, community-based farmer to farmer initiatives now complement or substitute for traditional public extension services. As more actors become involved in extension, combined with the diverse actors involved in the agriculture sector a more intersectional, collaborative, and team-oriented approach is required to ensure that multiple perspectives are being represented and diverse needs are being met.

Using more participatory and facilitative approaches that encourage farmer-to-farmer and peer learning, and support community-based extension and learning can help to better reach farmers who are often neglected while also acknowledging the local and indigenous knowledge that they bring from their own experiences. Such concepts as the Community-based Extension Agent (CBEA), allow for knowledge to be generated and embedded within the community, bringing resources to small-holder farmers. These CBEAs act as a catalyst for promoting self-reliance, problem solving, and knowledge creation among poor farmers in rural communities leading to empowerment (Bonye, 2012). Ensuring that CBEAs are fully linked to resources such as public extension agents, for example, and by offering training in areas where they could gain additional knowledge will be important for the success and sustainability of the CBEAs. Where training is needed, developing learning resources and approaches that align with CBEA and community needs will be critical.
The Generating Revenues & Opportunities for Women to Improve Nutrition in Ghana (GROWING) project led by the International Potato Center (CIP) uses a CBEA approach to deliver agricultural trainings and ensure that timely extension support is provided for climate-smart production and post-harvest techniques for six different nutritious crops selected by the project. The project targets rural households facing food insecurity, low dietary diversity, and malnutrition, primarily focusing on households with pregnant women or young children under five. With approximately 90 percent of households in northern Ghana relying on agricultural livelihoods (WFP, 2023), the needs of smallholder farmers cannot be overlooked when trying to address the impending challenges in local food systems.

This paper aims to provide context and justification for the development of learning materials for the GROWING project that takes a multi-level, facilitative training approach considering the needs of smallholder farmers and low literacy populations, while seeking to address gender-related inequities. The approach and content were developed using a collaborative, team-oriented approach bringing together the GROWING project team, Savanna Agricultural Research Institute, local partners, and a Global Development Master of Professional Studies student from Cornell. The approach and methodology proposed as appropriate to learner needs are also included, along with conclusions and recommendations for updating of the draft training manual that emerged from the process.
CHAPTER 2: THE GROWING PROJECT

2.1 CONTEXT IN NORTHERN GHANA

Ghana is a country in West Africa (Figure 1) with a population of about 28.8 million people (WFP, 2020). According to The World Bank's development indicators, Ghana falls under the lower-middle income group with a GNI per capita of 2,280 USD and GDP per capita of 2,363 USD as of 2020. Additionally, the World Development Indicators show that the number of Ghanaians living in poverty (below $2.15/day) decreased by nearly 25 percent from 2005 to 2016 (42.5% to 25.3% respectively). This is significant progress, especially when compared to other countries in West Africa. According to the Human Development Index (HDI), Ghana had a HDI value of .46 in 1990, 0.14 points below the world average. As of 2021, it was able to increase its HDI to .63, 0.10 points below the world average. Ghana’s life expectancy also increased from 56 to 68.6 years in that period and expected years of schooling increased from 6.8 to 13.4 years. When looking at the “Social Progress Index” Ghana seems to be doing relatively well in comparison to other countries in the region, performing above the world average for the ‘Basic Human Needs’ dimension for example. However, its scores in advanced education, health and wellness continue to rank well below world averages. Similarly, when looking at the World Happiness Index, Ghana currently ranks 111 (out of 146), a ranking below other countries it outranks in terms of the more economic growth-focused indicators. While Ghana’s economy has been growing and doing better in comparison to other countries in the region, impacts of economic growth don’t always translate to a better life for many Ghanaian rural
households. Ghana’s national literacy rate is 69.8% and even lower among women and in the fNR (GSS, 2021). While Ghana has made tremendous progress in poverty reduction over the past 20 years, with the incidence of poverty declining from 56.5% in 1992 to 23.4% in 2016 (Cooke et al., 2016), inequities exist between Southern, Middle, and Northern Ghana belts. For historical and structural reasons, poverty rates (2016) in rural Northern Ghana (68%) are 2.8 times higher than the rural national average (24%). Other data also point to gaps in addressing other indicators of wellbeingsuch as health and nutrition outcomes, especially among women and children in the northern part of the country.

Data gathered in 2014 by the Ghana Demographic and Health Survey estimated that one in every 24 Ghanian children dies before reaching the age of one and one in every 17 does not survive to their fifth birthday. Although overall infant mortality rates in Ghana have declined since 1998, the infant mortality rate for children under five remains high in the Northern, Upper West and Ashanti regions of Ghana (DHS, 2014). According to the World Bank, undernutrition (fetal growth restriction, suboptimal breastfeeding, stunting, wasting, and micronutrient deficiencies of vitamin A, iron, and zinc) contributes to 45% of all children deaths under five worldwide and perpetuates poverty by impairing cognitive function, causing poor physical status and hinders economic growth. (World Bank, 2013). In Ghana specifically, during the 2011-2020 period, 97,000 deaths of children under five were related to stunting. Factors like undernutrition, stunting, wasting, and malnutrition continue to impact children in Ghana. Malnutrition also has significant impact on women, especially of reproductive age, and can perpetuate the cycle of malnutrition: Absence of a nutritious diet can lead to complications or poor fetal development during pregnancy caused by low body mass, anemia, or micronutrient deficiencies – with 42% of Ghanaian women ages 15-49 being anemic (WFP pg. 12, 2020). Under-five mortality rates are twice as high in the north than
in the other two belts (Ghana Statistical Service (GSS) et al., 2018), and vitamin A deficiency among children under five years of age (2017 figures) is 30.6% in the Northern belt, compared to 18.1% in the Middle and 17.0% in the Southern Belt (Wegmüller et al., 2020).

Cultural beliefs and norms can have an important impact on food choice, nutrition and health. For example, some children and pregnant women avoid certain foods such as animal-sourced foods due to cultural factors. Some people have also been known to avoid foods such as sweet potato as they are believed to have adversary effects on people with diabetes or malaria. Additionally, cultural norms around gender have greatly impacted food and nutrition security. For example, women in Ghana are generally expected to be responsible for taking care of household chores. Only when those are completed can women then engage in other activities such as food production (Steiner-Asiedu, et al., 2017). In some parts of the country, in the Northern Region for example, food production and allocation decisions tend to fall on men because farming is seen as a men’s responsibility. This greatly impacts household nutrition as men are more oriented toward producing for the market rather than for household consumption.

To date, Ghana has used supplementation and fortification – such as a vitamin A supplementation campaign that distributes vitamin A supplements twice a year - as main strategies to address issues of micronutrient deficiencies. While this approach has been promoted for over two decades, it is quite costly and the coverage of vitamin A supplement distribution, for example, varies significantly between each round of distribution, sometimes not being administered at all (UNICEF, 2018). Additionally, many women and children do not consistently visit clinics, therefore they may not receive the supplements at the appropriate time or they may not be available in rural areas. Due to these challenges Ghana is trying to strengthen its routine supplementation
services and food fortification strategies such as fortifying cooking oil with vitamin A or flour with iron and biofortification of staple crops through breeding techniques. However, these programs are not evenly distributed throughout the regions of the country, and still rarely reach children and women who need it most (UNICEF, 2007).

Since chronic malnutrition is far more prevalent in the north of Ghana donors such as the World Bank, UNICEF, WFP, and others have concentrated their main efforts in these regions. While this increased attention on high need regions has led to improvement in selected health outcomes (e.g. higher vaccination coverage), nutrition outcomes have shown little progress. This prompted increased efforts in shifting approaches and services delivery models to focus on aspects such as complementary feeding practices. Concomitantly, research in biofortification has increased and new technologies or crops were introduced to help combat low productivity in the agriculture sector especially among smallholder farmers who are more prone to the impacts of climate change and natural disasters and have minimal access to good seeds and planting materials. Strengthening smallholder farmer's access to quality planting material and biofortified crops can potentially help improve productivity, increasing access to food both for household consumption and economic benefits.

Agriculture is a vital component of Ghana's economy, contributing 18.5% to the Gross Domestic Product (GDP) in 2019 and employing 50% of the workforce. Agricultural extension plays a crucial role in fostering agricultural and rural development by providing farming communities with essential information on new technologies.
The former Northern Region (fNR), further divided into 3 regions: Savannah, Northern, and North East since 2018, typically fall below other regions of Ghana across most indicators of development performance. For example, fNR is home to one-fifth of the country’s poor, while only having 10% of the population (Cooke et al., 2016, CIP, 2022). Also prevalent in fNR are “highest level of thinness among women of reproductive age (WRA) (11.8%), the highest total fertility rate (5.8 children), but the lowest incidence of having the most recent birth delivered in a health facility (35.4%) (GSS et al., 2015) and the highest prevalences of stunting (33.1%) and anemia (82.1%) among children under 5 years of age.” (CIP, 2022). The conditions contributing to these statistics are closely tied to the status of women in the fNR. Only 27.2% of females age 11 and above are literate, making fNR the lowest ranking region in terms of percentage of women who have completed secondary school or higher (GSS, 2015). Early marriage is prevalent, with 28% marrying before turning 18 (Ahonsi et al., 2019; GSS et al., 2011). Additionally, over a third of WRA in the fNR (38.4%) reside in households with co-wives (GSS et al., 2018; CIP, 2022). Lastly, women in Northern Ghana bear a disproportionately high burden of unpaid care work, surpassing the national average. A study conducted by the Ghana Statistical Service found that gender disparities to be particularly high in the Northern Region where females devote seven times more time to unpaid work than their male counterparts. (GSS, 2012; CIP, 2022).

2.2 GROWING PROJECT OVERVIEW

The Generating Revenues & Opportunities for Women to Improve Nutrition in Ghana (GROWING) project is a 4 years and 9 months project funded by Global Affairs Canada (GAC). The GROWING project uses an integrated climate-smart agriculture-nutrition-marketing approach, coupled with strong support to transform the individual agency of women as well as the enabling environment, including gender norms and roles as well as attitudes and behaviors, so that
key gender inequities are addressed and more appropriate practices initiated to ensure more equitable outcomes for women, in particular their nutritional and financial security. This will be achieved in part by organizing rural women and men in Growing Futures Clubs (GFCs) that will enable trainings concerning growing, consuming and marketing of more nutritious crops in a more environmentally sustainable fashion, and interventions to reduce gender inequalities concerning growing, consuming and marketing nutritious foods. With the goal of improved nutritional and financial security of women, youth, and young children in 6 selected districts of fNR in Ghana the project aims to reach at least 9,612 women of reproductive age and women from marginalized groups, 5,292 men (mostly spouses) and 7,560 children under five years of age. A large number of indirect rural beneficiaries and marketing activities are intended to reach at least 40,000 urban consumers promoting more nutritious foods (CIP, 2022).

As stated in the Project Implementation Plan Document, the project activities are centered around three main objectives:

1. more equitable and enhanced nutrition for households, especially for women and young children;
2. Increased control for women and youth on how revenue from sales of nutritious foods is utilized;
3. Improved support for a more inclusive, gender-equitable, nutritious, climate-smart, and resilient food system.

The six selected districts in the Northern, Savannah and North East regions all exhibit similar high prevalence of stunting (≥20%), anemia (≥20%), vitamin A deficiency (≥20%) and >30% of the population living in extreme poverty, surviving on less than 1.25 USD per day (CIP, 2022). Under the agricultural component of the project, GROWING aims to develop a set of Climate-smart Agriculture modules along with supplying seeds to promote an improved set of climate-smart
agronomic practices for vitamin A rich orange-fleshed sweetpotato (OFSP), calcium rich moringa and amaranth leaves, vitamin C rich papaya fruit, protein-rich soybean (four districts in the North East and Northern regions). The project uses two new (released in 2020) drought-tolerant, vitamin A rich orange-fleshed sweetpotato (OFSP) varieties specifically bred in Ghana for Northern Ghanaian conditions and evaluated by local farmers over several years, combined with access to an early maturing variety of a legume crop (either groundnut or soybean), papaya (pawpaw), and moringa to address major dietary micronutrient deficiencies (CIP, 2022).

The project also promotes climate resilient and sustainable seed system interventions including use of drought tolerant and disease resistant varieties of nutritious OFSP and moringa and early maturing, drought-avoiding varieties of groundnuts and soybean and amaranth. The use of climate-smart planting material conservation and multiplication systems, such as the “Triple S root-based storage in sand method” for sweetpotato during the dry season, and backyard seed conservation and production strategies for amaranth, papaya (pawpaw), and moringa will also be promoted through the agricultural component of the project (CIP, 2022).

Figure 2. Components of the Integrated GROWING Project (CIP, 2023)
Figure 2 shows the key components of the GROWING project, Agriculture, Nutrition, Saving and Loans, Income Generation, Marketing, and Gender Dialogues, highlighting specific activities that will ultimately lead to “more food secure, better nourished families with greater gender equity.” Project interventions addressing the components highlighted in Figure 2 will be conducted in three different cycles, each cycle lasting 24-26 months. After the GFC members are identified, the four major components of integrated intervention, nutrition, climate-smart agriculture, gender inequity, and marketing and business skills will be deployed (CIP, 2023).

2.3 KEY ACTORS AND PARTNERS
“GROWING is an action research project being led by the International Potato Center (CIP), an International agriculture research (CGIAR) center with deep experience in integrated agriculture-nutrition-marketing efforts, in strong partnership with 1) CARE, who have developed and tested women’s empowerment programs in Northern Ghana that increased capacity and skills of women smallholders, expanding their access to financial services, productive assets, inputs and influence over household decisions; 2) the nutrition division of the Ghana Health Service, which since 2000 has been investing in increasing access to health and nutrition services through establishing and strengthening sub-district level health facilities and Community Health Planning and Service (CHPS) units along with recruiting more nutrition officers; 3) local non-governmental organizations engaged in agriculture and district-level Ministry of Food and Agriculture extension personnel; and 4) regional and district level agents of Women in Agricultural Development Directorate (WIAD) of the Ministry of Food and Agriculture (MOFA), which supports women’s groups in processing of biofortified crops. Consulting services and private sector actors will be engaged for water management services, small livestock (cavy) rearing, media-based
interventions, multiplication of quality planting materials, and agro-processing equipment installation and training on use” (CIP, 2022).

The agricultural component of the project focused on the six nutritious crops specifically relies on strong partnerships between CIP, CARE, MOFA and Savanna Agricultural Research Institute (SARI), a member of the Council for Scientific and Industrial Research (CSIR). SARI, having played an important role in in development of local OFSP varieties adapted to northern Ghana, was also contracted to help provide technical input and support for the development of the agricultural training modules. MOFA and District Government Extension Personnel were designated to provide technical support and extension services to farmers. However, results from the GROWING project’s baseline evaluation show that only 8% of households surveyed accessed extension services during the previous 12 months. While this low utilization of public extension services can be due to many factors, such as prioritization of commodity crops, decreased funding for public extension services or transportation challenges, alternative, more community-based approaches are being used by the GROWING project. The project plans to utilize the Community-based Extension Agent (CBEA) model developed by CARE to ensure that knowledge and expertise is developed for and stays in the community. While many partners are involved in the project, the most important and critical actors are people living in the target communities. Community involvement is key to ensuring that project design and activities reflect community priorities and household-level needs.

CHAPTER 3: TRAINING AND LEARNING METHODS AND APPROACHES
Farmers are a diverse group of people with evolving needs. They face complex and ever-changing challenges brought on by natural disasters, climate change, unpredictable market forces, and
disruptions in access to inputs. Managing change requires adaptation and innovation. Effective extension and advisory services, whether public, private or integrated within projects such as GROWING, help farmers access new ideas, evaluate options, and organize for peer learning. Unfortunately, training of extensionists includes little preparation in adult learner-centered pedagogy, community organizing for peer learning, or other competencies beyond the transfer of technical knowledge. These limitations are especially acute when working with resource-limited, low literacy smallholder farm households. Additionally, lack of funding and resources at local levels has impacted the efficiency and effectiveness of extension services. These constraints along with diverse farmer profiles and rural farmers' lack of access to these services have required extension to become more pluralistic. The skills and experiences required of extension workers also need to evolve. Therefore, new learning programs need to be developed in order to equip the extension worker with those skills (Davis & Sulaiman, 2014), such that they can effectively contribute to the success of agricultural learning initiatives.

The GROWING project utilizes a training of trainers (ToT) approach to conduct and facilitate key topics covered by different components of the project. Specific to the agriculture component of the project, GROWING staff in partnership with key local actors, such as SARI, are working to develop learning resources that align with project objectives, address community needs, and are appropriate to different types of learners. Given the multiple topics being covered, the diversity in learner profiles and the intersecting identities of community members, local partners and project staff, a variety of approaches and methods should be utilized for trainings at all levels and integrated into the development of the learning resources. Additionally, by identifying community-based extension agents (CBEAs) in each district, the project prioritizes capacity building of local community members to ensure that knowledge is developed and shared in the community, thereby
addressing the needs of rural farmers, and leading to more sustainable, locally available extension services.

The project aims to promote nutritious food crops to contribute to household dietary diversity and improved incomes among the selected communities that are mainly dependent on agriculture for both food security and income. While the region of implementation provides a conducive environment to grow the selected nutrition crops, based on baseline data collected by the project, few households grew these crops in the last agricultural season. With the exception of soybeans and groundnuts, which are commonly grown in the regions (56% and 62% respectively) the baseline data showed little experience with the other crops promoted by the GROWING project. Only 15% of households grew any type of sweetpotato, 3.6% grew moringa, 2.3% had papaya and only 1.7% cultivated amaranth (CIP, 2023). This suggests that in addition to educating project participants about the nutritional and health benefits of consuming the selected crops (covered by the nutrition component of the project), the agriculture trainings must provide technical know-how on basic management practices, strategies for strengthening resilience to impacts of climate change, and post-harvest practices so that these nutritional crop options can be successfully grown and utilized in the community. A combination of technical knowledge fit to the context of the selected regions along with educational approaches that are participatory in nature and are adaptable to learners with varying technical agricultural skills, literacy and education levels, and access to resources will enhance prospects for successful training outcomes.

Given low-literacy levels and low-levels of formal education in the regions of implementation, especially among women (GSS, 2021), the learning resources and trainings should utilize techniques and approaches that address varying skill levels that exist in these communities. This
will help to ensure that the information shared through the agricultural training is easily understood by all farmers and community members.

Lastly, thorough analysis of context and realities of the learners need to be carried out so as to inform an approach well adapted to those local realities while also feasible given available infrastructure, program capacities and resources (Zholdoshalieva, et. al., 2021). In the context of the GROWING project, understanding the realities and needs of resource poor farmers (RPFs) will be critical to ensure a strong emphasis on creating space for RPFs to participate, feel empowered and be treated with mutual respect (Chambers, 2017). Needs should be identified and be prioritized by the community in a collaborative and participatory way. An emphasis on interactive and experiential ground-truthing to check diversities and local complexities or ‘reality checks ’is critical, while unfounded assumptions need to be avoided (Chambers, 2017).

Taking into account the context, project objectives and educational approaches highlighted so far, a draft training manual was developed, which includes key content on the six nutritious crops (OFSP, papaya, moringa, amaranth, soybean, or groundnut) being promoted by the GROWING project and highlights climate-smart approaches. The following sections will provide an overview of “good practices” to consider when developing learning resources and will explain the GROWING project training approach.

3.1 ADULT LEARNER CONSIDERATIONS
One of the critical pieces for developing a successful educational program for adults lies in understanding the unique characteristics and preferences of adult learners. This is an especially important consideration when developing agricultural learning and training initiatives which often
include a hands-on or practical component. While there may be some commonalities among different types of learnings it is essential to not only acknowledge the distinct ways in which adults learn but also consider adults from different contexts. Understanding various theories and approaches to adult education is essential for creating effective learning programs and resources, ensuring they are tailored to the specific needs of the intended audience. This understanding not only establishes alignment with the preferences of adult learners but also enhances the likelihood of achieving targeted learning outcomes.

Adult educators and learners often struggle with “how to reconcile experience with theory” (Gouthro, 2019, pg. 66). In educational research, the recognition of the importance of both formal and informal theories is crucial. While formal theories offer a valuable foundation for educators and learners, informal theories derived from life experiences play an equally important role. It is important to consider the impact of these informal theories on how educators approach teaching and learning in diverse settings. Therefore, understanding of both formal and informal theories is essential for teaching and learning dynamics in various contexts. (Gouthro, 2019).

As mentioned, adult learners often come with diverse experiences, motivations and learning styles. Utilizing the experiential learning cycle can be a useful framework for understanding how different individuals learn through experiences. By offering the space for adults to engage in the process of participating in an activity or experience, reflecting on the experience, connecting to existing knowledge, and experimenting, experiential learning programs can accommodate an individual’s needs. Experiential learning builds on life experiences that adults bring; it encourages reflection on these experiences, allows the learners to put their newly gained knowledge into practice and builds the capacity for self-directed learning. All these pieces of the experiential learning cycle
promote a deeper understanding of the information and allow for reflection and practical skills to be developed for real-world situations (Kolb, et al, 2017).

3.2 LITERACY, LANGUAGE AND EDUCATION LEVEL CONSIDERATIONS

The fNR has some of the lowest literacy rates in the country (Northern 41%, North East 36% and Savannah 33%) compared to a national average of 70% (GSS, 2021). Literacy levels and educational attainment of learners were also important points of consideration when developing learning programs and resources for the GROWING project. Learning program practices for adults with low-literacy and low levels of formal education should rely on approaches that are simple, easy to understand through visuals, and reflect relatable experiences.

Low-literacy adults have unique needs. When working with projects that are targeting these learners it is important to design learning activities so that literacy levels are not a significant barrier to learning. It is also important to distinguish between low-literacy and illiterate learners. While illiterate learners are unable to read, low-literacy learners can understand and read basic words and sentences (Pamphilon, 2017). Low-literacy learners may, however, become distracted or overwhelmed if learning activities are too text-heavy and/or devoid of visuals or hands-on approaches to learning.

While continued exposure to written materials may help improve their literacy skills overtime, as educators or facilitators it is important to address the needs of the participants at present and ensure that materials are developed for all learners that will be engaged in a particular learning program. As mentioned, visual literacy, such as using picture-based materials, is a method that can be utilized to enable low to no literacy learners to engage in the material and content being shared.
However, it is important to note that visuals may not always be interpreted in the same way by all users (Arbuckle, 2004). Arbuckle (2004) also highlights that visual literacy is a cognitive skill dependent upon understanding specific pictorial conventions. Because of this and because exposure to illustrated educational materials may be limited in daily life, especially in many developing countries, not all visuals or pictures may have the same effectiveness. In this regard, using pictures that are locally developed, simple and fit to context can lead to better comprehension outcomes for low-literacy learners (Dowse & Ehlers, 2001).

Lastly, while English is the official language of Ghana due to colonial influence, approximately 80 languages are spoken throughout the country (Afrifa et al., 2019; Simons & Fenning, 2018) which is an important consideration when developing learning engagements. As many of the indigenous languages are closely tied to ethnic groups (Afrifa et al., 2019), understanding where participants are from and what languages they speak is essential when making decisions about translations needed and languages that should be prioritized.

3.3 GENDER CONSIDERATIONS
Recognizing the impact of power dynamics, gender roles and norms within communities is crucial (FAO, 2023). For instance, there exists a significant gender disparity in unpaid care work, with females in the Northern Region spending seven times more time on such activities compared to men (GSS, 2012). This contrast highlights the importance of tailored training programs that take in to account the unique challenges faced by women. Literacy constraints, particularly among women in fNR present additional challenges that should also be considered. Considering the “double burden” that women face due to gender norms, inequities in assets and capabilities
(Kabeer, 1994) and the additional and diverse challenge they face underscores the need for an intersectional training approach.

The GROWING project takes an integrated approach to addressing food security, improved nutrition in the household and increased financial security with a main objective to reduce gender inequity within the home. GROWING uses the project-level Women’s Empowerment Index in Agriculture (pro-WEIA\(^1\)) as a measurement for women’s empowerment. The baseline conducted showed that while 42% of men achieved empowerment, only 13% of women reported this achievement. Additionally, the results showed that there is significant variation in degrees of gender inequity between project districts. For example, the pro-WEIA indicated that Gushegu district has a score of .36 on a scale of 0-1, with this district also having one of the lowest scores on several nutrition indicators. (CIP, 2023)

To date, the project has conducted an extensive social inclusion analysis in 25 GROWING communities in the six districts and solicited feedback from stakeholders to incorporate into the project’s gender strategy. GROWING project staff along with project implementing partners (IPs) were then trained on CARE’s Social Action and Analysis\(^2\) (SAA) model. SAA is a facilitative process which allows individuals to reflect on social norms and practices that shape their lives with the aim of addressing social barriers, leading to gender norm transformation. The project has trained gender champions to start facilitation of the gender dialogues for both men and women in the project communities. These gender dialogues are an entry point to help communities explore their individual and collective views related to empowerment and identify domains for change.

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\(^1\) Pro-WEAI (ifprhttps://weai.ifpri.info/versions/pro-weai/i.info)
Gender dialogues help to create a space for discussion and reflection, shedding light on gender roles, stereotypes, and customary practices that may cause gender inequities that currently exist. While gender dialogues are a major activity of the project being led by the CARE Gender Specialist and community selected Gender Champions, designing an appropriate gender approach specifically for the agricultural component will also be important to ensure that gender considerations are integrated into all areas of the project.

3.4 TRAINING APPROACH FOR THE GROWING PROJECT

The Project has identified targeted communities that have been formed into what are called Growing Futures Clubs (GFCs). These GFCs are comprised of rural women and men, predominately from households with children under five years of age or pregnant women, who have been recruited by the project. There will be approximately 30 households per club with a total of 135 GFCs during the lifetime of the project. The agriculture component is being led by two project technical agriculture staff (agronomists), one from CIP and one from CARE. District-level project staff, called Community Facilitators (CFs) and local NGOs will then train specific community members to be designated Community-based extension Agents (CBEAs) who are responsible for delivering the trainings to each GFC. The CBEAs are community level volunteers, who are farmers themselves, identified by the project in a participatory process with the community, to become the local facilitators on improved and sustainable production and postharvest management techniques of nutritious crops. CBEAs receive training from the GROWING project team and district/sub-district level government extension staff on how to facilitate learning engagements to Growing Futures Club members and provide support to the project.
It is important to acquire a foundational understanding of who is involved, the types of skills they have and how trainings should be developed to ensure that the content provided is being delivered in a way that is most appropriate for learners at each stage. Figure 3 shows an overview of the sequencing of training described.

Figure 3. GROWING Project Training Approach

The Community-Based Extension Agent (CBEA) approach addresses the limitations of formal agricultural extension services in Ghana's Northern Regions, which arise due to a scarcity of extension officers at the district levels. With limited resources available, regular visits to all farming communities, especially ones in rural areas, are challenging, resulting in inadequate access to essential extension services. CBEAs, who are volunteers from local communities, will be trained so that they can step in to offer agricultural guidance based on fundamental knowledge acquired from the GROWING project and its partners such as the Department of Agriculture or other organizations.

The CBEA approach, initially piloted by CARE International, Ghana, and other organizations in Northern Ghana, capitalizes on local expertise and community-driven knowledge acquisition. This
innovative approach recognizes someone within the community as a local expert on farming systems. This individual will not only be trained to share new knowledge on improved agricultural practices but will also integrate existing indigenous farming practices. Additionally, the CBEA becomes a central figure for information sharing, conflict prevention, management, and resolution within the community.

In the context of the GROWING project, CBEAs will play a vital role in providing GFCs with the required knowledge in crop production. After receiving training from the GROWING project staff, CBEAs are tasked with promoting and monitoring climate-smart agricultural practices to ensure high yields and increased income for project beneficiaries. Furthermore, CBEAs act as crucial intermediaries between traders and GFCs, fostering the continuation of GFCs as functional clubs even after the project concludes.

To ensure the effectiveness and transparency of the CBEA recruitment process, a well-structured protocol was developed by the project team. This protocol emphasizes social inclusivity and clearly outlines the roles and responsibilities of CBEAs as well as selection criteria, in the GROWING project. As GROWING is an action research project, a structured approach to CBEA selection was developed to provide insights into the most effective type of CBEA to use in a Growing Futures Club Approach. (CIP, 2023)

The project, through its structured approach for CBEA selection, pre-assigned communities with specific CBEA criteria related to their gender and social status. Each community was randomly assigned to select a CBEA with a combination of specific characteristics such as male or female CBEA and “leader” or “peer” social status. A “leader” was defined as someone in the community
that has many connections, seen as a “leader” and has the respect of many people while a “peer” was defined as someone in the community who is seen as “similar” and has many common characteristics with people in the community. For example, “community A” may have been assigned to select a CBEA that identifies as female and is seen as a “peer”, while “community B” may have been assigned to select someone who identifies as male and is consider a “leader” in that community. These designated variations in characteristics were determined by the project, not the communities.

In addition to the structured criteria, the project also provided the communities with a list of key characteristics that the chosen CBEA should possess to be selected. Aside from being a member of the GFC and a resident in the project community, the CBEA must also have sufficient numeracy and literacy levels and some basic education meaning that they should be able to write numbers and their name and be able to speak in simple English. The CBEA must also possess qualities of being punctual, honest, reliable, confident and articulate, and able to work with other community members. Lastly, the CBEA must be willing to be a volunteer and be committed to living in the community for the next two years, dedicating approximately seven to nine days per month to attending and facilitating trainings during the agricultural season. The use of a digital tablet will also be a part of the CBEA’s responsibility. However, digital or technological literacy was not prioritized, and it is assumed that youth within the CBEA’s household would be able to assist with the use of tablets and the monitoring role. Once the information is shared with GFC members, they are given the opportunity to discuss and select the person in their community that they think would be the “best fit” for the role.
While the protocol provides clear guidance for selection of CBEAs and their roles and responsibilities, the project should further test, validate and adapt the criteria to fit the profile of people based in the project communities. The CBEAs act as a link between key actors such as the project staff, government extension agents, GFC members and other local partners. Activities under the agriculture component such as training of GFC members on sustainable production techniques of the nutritious crops, data collection, and management of demonstration sites, to name a few, rely on CBEAs ‘abilities to meet the high demands of their role. Additionally, depending on the demographics and norms within each community, certain criteria may be more challenging to meet than others. These considerations should be taken into account when communicating criteria to GFCs and also when making final selections of CBEAs. [GROWING CBEA Protocol document, 2023]

3.5 FACILITATIVE APPROACHES (CARE’S FFBS MODEL)

The GROWING project utilized CARE’s experience in working on both women’s empowerment programs in Northern Ghana and in implementing the Farmer Field and Business School (FFBS) toolkit³, developed by CARE (CIP, 2022). Relevant aspects from the FFBS toolkit such as the agricultural, gender, marketing and facilitation tools were adapted to ensure climate-smart, sustainable production methods are integrated and all modules are gender-responsive in their training approach. In addition to the FFBS, facilitation tools are especially important when considering how the information in the manual should be shared at all stages of the ToT, from the training of Community Facilitators and Implementing Partners, to CBEAs and all the way to farmers. This allows for everyone involved in the project to develop and practice facilitation skills

so that training can be conducted in a way that is more engaging for the participants and allows for more discussion and less top-down lecture-based approaches.

Using the term “learning engagements” instead of trainings to describe the different modules tries to highlight the more facilitative approach the project is taking to engage with farmers. Traditionally, training implies more top-down, one-way technical expertise being shared where learning engagements try to address a space for collective and shared knowledge among facilitators and farmers.

CHAPTER 4: DEVELOPMENT OF THE GROWING PROJECT AGRICULTURAL TRAINING MANUAL FOR NUTRITIOUS CROPS

The GROWING project training manual to-date includes learning resources for the step-down training and facilitation techniques to be applied by Community-based Extension Agents (CBEAs) and other frontline extension agents who interface directly with and train farmers. The learning engagements were developed for key topics important for GFCs who will be implementing climate resilient and sustainable production and postharvest practices for the selected nutritious crops. The materials will be shared with project-identified local NGOs (called Implementing Partners) and Community Facilitators hired by the project to be based in project districts. Learning resources were developed with these key considerations in mind to ensure that learning needs for diverse adult learners are being met to the extent possible.

4.1 THE PROCESS

The project training manual development team consisted of SARI, hired by the project as consultants to provide technical input and support for the development of the learning resources,
the GROWING project staff, and a Cornell University student, completing her Master of Professional Studies (MPS) in Global Development. The manual was developed using a team-oriented approach that provided for continuous refinement throughout its development. The compilation and research on technical information related to agricultural context and production practices of the selected nutritious crops were led by SARI and GROWING project agronomists while the analysis and integration of different adult learning principles and the development of the training approach, was led by the Cornell MPS student with extensive support from the GROWING project team.

The team started by validating the topics listed as a part of the Program Implementation Plan, ensuring that they were still relevant and aligned with the realities observed while conducting trainings. Based on project priorities and on-the-ground realities, the team agreed to develop 25 different learning engagements focused on the six nutritious crops. The learning resources are built upon prior insights and lessons learned from project partner organizations, initial work done by CARE and CIP, leveraging their deep expertise and experiences from prior projects in multiple countries, and a review of existing resources available related to the nutritious crops being promoted by the GROWING project. This analysis also aimed to identify learning initiatives and resources that could be replicated or adapted for contextualization of GFCs specific needs.

The team responsible for the manual development was comprised of members with diverse professional backgrounds. Most members had extensive technical knowledge in agriculture, and experience with several of the nutritious crops being promoted by the project. This technical expertise was supplemented by team members with expertise in relevant social sciences, and/or adult education and experiential and non-formal learning pedagogy in order to develop a
well-rounded manual consistent with community-identified needs and learner-centered pedagogy.

To evaluate what resources already existed and were available, the team reviewed other agricultural learning resources such as the Mennonite Economic Development Associates\(^4\) (MEDA) groundnut training manual for Northern Ghana, CIP’s OFSP trainings for other countries, the CARE FFBS toolkit, and SAWBO\(^5\) training videos. This review found that while some resources could be utilized and adapted for certain crops prioritized by the GROWING project (such as OFSP, groundnuts, and soybeans), fewer specific resources were available for other crops such as papaya, moringa and amaranth.

Based on this the team was able to utilize some materials from existing projects mainly from CIPs OFSP and MEDA’s groundnut training materials. CIP’s OFSP resources were adapted by the team to fit the context in fNR. MEDA is currently implementing a project in Northern Ghana also being funded by GAC. Given this connection, the donor of the projects, GAC, facilitated coordination and encouraged sharing of training resources where relevant. Certain structural guidelines such as the adult education tips and use of “learning engagements” that focus on more facilitated, discussion-based approaches that are context specific, value participants knowledge and encourage shared learning were adapted for the GROWING project needs. Technical concepts related to groundnut challenges, site selection and land preparation were also reviewed and adapted for GROWING project use.

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\(^4\) MEDA’s GROW2 project, funded by GAC - https://www.meda.org/projects/grow-2/

\(^5\) https://sawbo-animations.org/index.php
While technical knowledge from the team and existing curricula focused on certain crops could be utilized, existing resources for such crops as papaya, moringa, and amaranth posed more challenges requiring the team to develop new content. The content incorporated for these crops relied heavily on technical expertise and research provided by SARI and CIP and CARE’s technical team to frame and prioritize learning outcomes and learning engagement activities relevant for the projects GFCs.

The GROWING project training approach, as noted in Chapter 3, relies on a multi-level training of trainers approach that requires needs at all levels to be addressed, which posed many challenges. For example, given that some of these crops were newer to some of the district-level extension agents they may value more technical content that is less tailored or not applicable for farmers. These differences in opinions and priorities posed challenges when deciding who the end user of the manual should be, acknowledging there could be multiple. Given the diverse needs, the manual makes an effort to incorporate different approaches and different types of information that may fit diverse learner needs. PowerPoint slides with more technical information were created with support from SARI to train the first level trainers such as CFs, IPs, district-level extension agents and CBEAs and are separate from the manual. The manual aims to take the key points from the technical PowerPoint presentations and break them out into practical, participatory, hands-on trainings called learning engagements.

After discussion and deliberation, the team decided the learning engagements would follow a simple three step process to 1) introduce key themes and ask assessment questions that are also aimed to draw out farmers experiences and current knowledge for open discussion, 2) utilizes mixed and diverse approaches for a main activity related to the theme, and 3) closes with questions
that both evaluate knowledge gained by participants overall and encourage reflection. This aims to provide a simple, straightforward and consistent approach for facilitators of varying levels and skills to follow, addressing the main points in a direct way that considers time and resources constraints of GFC members. This also allows participants to know what to expect for each session thus enabling them to better relate to and engage with the information and activities. A sample implementation calendar is also included in the manual which aligns with the agricultural season for each crop. This provides guidance to the facilitators optimizing the timing of learning engagements for maximum real-time impact for each nutritious crop and climate-smart practices.

In addition to the written guidance, each manual also includes a visual aid in the form of a laminated card showing graphics that highlight key points and takeaways for each learning engagement. This provides both facilitators and learners with an added visual that can help to further convey the key messages and adds another method for sharing information with participants with different learning styles and language abilities. The front of the cards will include the appropriate pictures and graphics and the back of the card currently provides a written description of each graphic/picture on that particular card. Additionally, text such as discussion questions and facilitation guidance included in the manual could also be incorporated here. The laminated cards are being designed by a graphic designer consultant and are still under development.

Lastly, to address the need for more technical, research-oriented information for district-level extension agents and the SARI team, short “technical briefs” will be included in the manual as references that can be utilized by facilitators that may want to gain more technical knowledge about each nutritious crop.
4.2 KEY COMPONENTS OF THE MANUAL

The draft manual includes an overview of the GROWING project objectives and activities, followed by sections that explain the guidelines for using the manual and, 25 different modules of learning engagements with themes related to production and post-harvest handling and storage of the six nutritious crops. Tips on facilitation techniques and adult learning approaches are also included as helpful resources for facilitators. The manual also includes an example implementation timeline that was created to align with the growing season for each crop and can be tailored as needed. In a forthcoming version, the manual will also include short technical briefs as an annex which incorporates more technical research-based information that may be useful for district-level extension agents or CBEAs with higher levels of agricultural knowledge as references. Different graphic icons and visuals throughout the manual aim to help serve as prompts for lower-literacy learners and CBEAs who are less experienced with facilitation skills. A gender-inclusive lens is applied to addresses gender-differentiated needs, with special attention to female learners. The manual not only provides training content but also offers valuable insights into effective facilitation techniques and adult education methods for implementation. By combining various strategies, the manual aims to create a training experience that fosters an inclusive and engaging learning environment for participants.

Guidelines

The guidelines for the manual include components that serve as introductions for each learning engagement. The guidelines include explanations of each module’s themes, the specific learning objectives, suggested times, location, facilitation techniques, key features of each module including local measurement references, and descriptions of additional resources included in the manual such as technical references and an implementation timeline. Additionally, the steps of
each learning engagement and definitions for each step are also included in the guidelines section of the manual and highlighted below.

**Warm-up Activity/Pre-assessment**

This is the first activity done at the beginning of every learning engagement to welcome participants and check-in with everyone. The participants will be asked pre-assessment questions that will evaluate the group’s current understanding of the themes covered in each learning engagement. The questions will also help solicit farmers’ current knowledge of the topic and encourage farmers to share their experiences.

Specific to the GROWING Project - As participants arrive, their presence should be recorded by digital monitoring through scanning individual identification badges. If the badge is missing, the complete name and gender of the individual should be recorded.

**Main Activity**

This is the main part of each learning engagement. The topic of each learning engagement will be introduced, and any important technical concepts shared. This is also where participants will engage in participatory or hands-on learning exercises that allow participants to further apply and understand the topic being covered in each learning engagement. The learning engagements will be facilitated by using visual aids such as laminated graphics, audiovisuals, or practical field exercises whereby the participants themselves participate in the agricultural activities such as land preparation, planting, and harvesting.
The project has already translated three SAWBO videos into the five most commonly spoken local languages and is working on its 4\textsuperscript{th}. These will be incorporated into the relevant lessons once they are completed.

\textit{Closing Activities/Post-assessment}

During the closing of each learning engagement the facilitator will do a recap of the key messages and will ask participants post-assessment questions to evaluate the group’s overall understanding of the content covered during each learning engagement. The participants will also have time to ask any questions that they may have and reflect on what they learned.

\textbf{CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS}

Developing learning resources for a training program targeting adult, low-literacy learners in varying situations is complex. Important factors to be considered are cultural sensitivity, strategies and methods for optimizing learner engagement, integration of local knowledge, and flexible and facilitative delivery methods. A continuous improvement of learning materials to account for these factors is crucial. Recognizing the importance of ongoing refinement of the GROWING project manual for nutritious crops, the following section offers some key conclusions, insights and recommendations for consideration. In particular, key lessons pertaining to the manual development process and forthcoming processes of adaptation and improvement are summarized.

\begin{itemize}
  \item \textit{A clear Monitoring and Evaluation (M&E) approach is necessary for testing the manual, fostering rapid adaptation and continuous improvement.} While a draft manual has been developed, testing and evaluation of training manuals should be prioritized as a
\end{itemize}
next step to ensure input is collected from learners and users of the manual. This will help validate assumptions in the current manual and ensure that community needs are prioritized. Ideally, a ‘year zero’ – learning and planning phase - for developing and testing a training manual and to solicit feedback from learners could be implemented, which would in turn provide a framework for continued M&E of the manual. Some considerations for M&E prioritization for the manual are as follows:

- Decide what the appropriate assessment process should be given team priorities, resources and the type of feedback needed. Questions such as: “Who is best positioned to gather the overall feedback data?” “How will it be collected?” “When and how often?” – should be discussed and decided as a team. This should be done in addition to the pre/post questions that are asked during each learning engagement.

- The plan for evaluating resources should take a mixed methods approach collecting both quantitative and qualitative data and comparing it with data already collected by the CBEA during pre/post assessment questions for each module. This will allow for data triangulation to help better interpret and understand how effective the different learning engagements are in achieving key learning outcomes.

- *Testing and refinement of the pre- and post- assessment questions for each learning engagement is needed to ensure that the questions asked help the project gather meaningful data and encourage participant reflection.* In its current form, to simplify the CBEAs’ data collection task during each learning engagement, “yes/no” questions have been developed as a way to informally measure groups’ general understanding of key topics and does not measure participants individual understanding. There are limitations to
the types of questions that can be asked given varying levels of CBEAs digital literacy (use of tablets for data collection) and facilitation skills. Taking this into account, it is necessary to frame questions in a balanced way such that the understanding of the content is measured, while it is also easy enough for the CBEAs to collect data during each learning engagement. As the training program evolves the project team could consider asking other types of questions that would be better at measuring what participants learned (e.g., open-ended questions). Acknowledging that it may be more challenging for CBEAs to collect this type of data, the team could consider recording the participants responses though the tablet and transcribe and code them later for analysis. This may be cumbersome but could provide more rich and interesting data that better captures what participants learned compared to yes/no responses.

- **Continuous feedback mechanisms are essential.** As noted, the draft training manual needs to be tested and further refined utilizing input and feedback from GFC members and CBEAs to ensure that the content is easily understood by farmers and by CBEAs as they are the ones delivering the trainings. Creating a mechanism that allows farmers and CBEAs to provide real time and continuous feedback will allow for the project team to quickly adapt learning resources, in order to better fit the needs of the communities in a timely manner, increasing its effectiveness and relevance. This will especially be important as the project continues to expand into other communities in cycles two and three of the project.

- **Effective collaboration among diverse partners is essential demanding a delicate balance of give and take.** Fostering collaboration among GROWING project’s diverse partners was essential for the development of the draft manual and will continue to be important
throughout the ongoing processes of improvement and local adaptation. This collaboration, however, poses challenges in bridging gaps between research and practice, as well as between quantitative and qualitative research perspectives. Working within a diverse team, especially when addressing various levels of education and navigating the diverse expertise from highly scientific and technical agricultural knowledge to social science, pedagogical, and practical community development knowledge, makes the process less straightforward. Discussions, debates, and points of contention among collaborators require time, attention to team building, and a skilled facilitator who can guide the team toward compromise and consensus. This complexity is not unique to the GROWING project but extends to any initiative aiming to develop learning resources with a diverse team. Stakeholders must navigate pedagogical biases and consider various types of expertise, from technological to pedagogical and community development, to find common ground and ensure the success of collaborative efforts, always keeping learner needs as the main priority.

- **Diverse literacy and language considerations are important when developing delivery strategies for learning resources.** Occasional misalignments may exist between research institutions and the practical needs of smallholder farmers, particularly those with low literacy and formal education levels. Therefore, the needs of low literacy learners and facilitators involved in the GROWING project need to be considered and addressed through appropriate methods. Utilizing high quality visuals and graphics that clearly explain key messages can help low literacy learners better understand concepts that may be hard to comprehend through text alone. This can also help CBEAs with lower literacy levels remember what should be conveyed in the learning engagements. The text and words used should also be simple and easy to understand both in English and when translated into
local languages by the CBEAs when needed. Additional recommendations to address literacy and language needs are listed below:

- The draft graphics should be tested with CFs, CBEAs and GFC members to ensure that interpretation of the images align with what each module is trying to convey. Depending on project budget, graphics could be printed out on regular paper for testing first then once feedback is received graphics could be updated and refined and printed out on laminated cards for use by CBEAs.
- Back or reverse translation is recommended where possible to ensure that meanings of the words utilized in the training manual are validated. This will be particularly useful when CBEAs need to translate the content to local languages when working with GFCs, taking into account that language can vary from district to district.
- Continued development or translation of any additional relevant SAWBO videos could be useful for the project and farmers going forward as they are open-sourced and can be accessed at any time through different devices.

- **CBEAs should be empowered to lead and take ownership of the training program in their communities.** Ongoing capacity building and support for CBEAs can ensure that CBEAs are equipped with tools and knowledge to independently lead and facilitate learning engagements aligned with their community needs. The draft manual was initially developed based on CBEA criteria and requires testing to confirm its suitability for varying literacy and education levels. For CBEAs to confidently take ownership of their roles and facilitation responsibilities, continued support from the GROWING project team and district level extension agents is needed. Additionally, strengthening linkages to relevant
resources is necessary to ensure CBEAs can easily access appropriate technical knowledge needed for their role beyond the GROWING project.

- **The different uses of the manual should be further discussed.** As there are many stakeholders involved with varying priorities, ongoing validation of stakeholder needs, with a focus on CBEAs and GFC members, is needed to ensure that the learning engagements are practical and tailored for intended users. The diverse education levels and expertise of trainers delivering ToT and step-down learning engagements should be carefully considered during the manual revision process. The current draft manual may be most suitable for district-level extension agents, Community Facilitators, IPs, and CBEAs with higher expertise and education. The testing of the manual will allow the team to validate the appropriateness of content and delivery methods. This can help to identify points where information or approaches could be adjusted to better fit different needs. For example, district-level extension agents may want information that is more technical or scientific and applicable on a broader scale, whereas CBEAs may be more interested in practical, hands-on application of techniques that relate to individual farmers in their communities. Additionally, CBEAs may want more visuals to be included in the manual to provide pictorial examples of the content being conveyed where SARI researchers and district-level extension agents may want more texts that further explains research conducted on specific topics.

These differences in priorities and needs of those who would be using this manual led to a lot of discussions and at times, disagreements between the level of technical detail and complexity that should be included and what the manual should look like. Questions arose
like: *who will be using it?*; *what will accessibility look like?*; *who will be growing crops?*; and *how it may be utilized by different “peer” or “lead” CBEAs?* Future iterations of the manual can consider incorporating different sections targeting different users and incorporating different approaches addressing multiple stakeholder needs.

- **The roles of key stakeholders should be further discussed and refined.** Absence of clearly defined roles and ways in which the manual can be used poses a challenge in the manual development. Possible steps to remedy this are clarification and fine-tuning of key stakeholder roles, including technical experts such as district-level extension professionals, training designers and pedagogy experts, and development practitioners involved in the project. Special attention should be given to further refining the distinct roles for district assembly extension agents as they will play a critical part in providing continued support to the CBEAs beyond the GROWING project. The next development cycle should also focus on creating distinct sections in the manual for the variety of users, integrating diverse learning approaches and addressing emerging issues from evaluations. This will enhance and broaden the manual's usefulness in subsequent cycles of the project.

- **Gender-responsive training approaches in agricultural learning engagements are critical for achieving gender equity.** While gender equity strategies are utilized in many aspects of the project, a stronger integration of these strategies is needed. More targeted gender interventions in the agriculture component will help ensure that the needs of both women and men farmer are addressed. The project should utilize the results of their

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6 Selection criteria randomly assigned to each community as outlined in the GROWING CBEA Protocol document (2023) and referenced in Chapter 3 section 3.4.
completed gender assessment to validate the previous desk-based gender analysis conducted during the project implementation plan period. This can help to better identify specifics gaps that can be addressed by the project.

There is a need for more deliberate implementation of gender focus in each learning engagement, addressing considerations around timing of the trainings, childcare resources, and competing demands on women’s time. Finding ways to better incorporate CARE’s existing FFBS gender tools and what is being conveyed during the gender dialogues into the agricultural learning engagements could be one strategy to ensure that the project is really embedding gender-responsive approaches into the agriculture component. However, how to best tailor the FFBS gender tools in a way that allows for CBEAs with low-literacy and varying levels of literacy to easily understand and deliver the information will be necessary. Collaboration between the GFC Gender Champions and CBEAs to integrate these approaches into the agriculture trainings could be an option. Additionally, the graphics for each learning engagement should be reviewed by the project’s Gender Specialist to ensure that the visuals are appropriate for the context and depicting images in a gender-responsive manner.

- **Effective collaboration and communication among GROWING project partners are key for success.** Lastly, given the complexities of the GROWING project, ensuring that strong collaboration and communication among project staff (CARE and CIP), local partners (NGOs, MoFA, WIAD, private sector, etc.) and project participants is critical to promoting transparency and aligning priorities. While CARE’s and CIP’s responsibilities are clearly defined in the project documents, actual roles seem less clearly differentiated given the
overlap in activities, specifically for the agriculture component. Trainings, use of demo plots, incorporation of CARE’s FFBS tools and other factors need to be continually discussed and evaluated, considering how these pieces fit together in practice.

Diverse expertise and complementary institutional mandates among GROWING project collaborators represent both a strength and a potential challenge for the partnership as it worked to develop key learning resources to support community-based extension. Divergent perspectives associated with diverse expertise and mandates brings a need for occasional reconciliation of competing ideas and priorities. Identifying someone with strong facilitation, network management and brokering skills, and entrusting them with the responsibility and authority can help accelerate what is often a lengthy process that involves finding a common language allowing experts in agronomy, adult and extension education pedagogy, project management, and community-development to speak with and learn from one another. The process revealed positive aspects and challenges associated with team-oriented approaches to developing learning resources. It highlights the need for continuous improvement and innovation in the learning process and acknowledges the value of learning from one-another, sharing and challenging perspectives, and questioning assumptions throughout the process.
REFERENCES


The content of this training manual was developed in collaboration with the GROWING project team, including staff from CIP and CARE most notably, Dr. Birhanu Temesgen (GROWING Project Manager), Mr. Abdul-Lateef Yakubu (Research Officer – Agronomist), and Mr. Mohammed Issahaku (Zonal Project Coordinator (Agricultural Sustainability)). Additionally, Dr. Issah Abukari and his team from the Savanna Agriculture Research Institute (SARI) played a critically role in providing significant technical input to the development of the manual and reviewing the overall approach. Mr. Stephen Ali, a private nursery manager from Tamale partnering with the project also contributed to the content related to backyard crops. Lastly, Mr. Joseph Nii was hired by the project to develop the graphics and visual aids that accompany each learning engagement.

Additionally, select language and learning engagement approaches were adapted from the GROWING project Quality Diets for Better Health: Growing Future Clubs Curriculum the Farmer Field and Business School (FFBS) manual developed by CARE International under their “Pathways to Women Empowerment” plan, MEDA’s GROW2 Groundnut GAP Manual and Scientific Animations Without Borders (SAWBO) educational videos.
CLIMATE RESILIENT PRODUCTION & POSTHARVEST MANAGEMENT OF NUTRITIOUS CROPS

A MANUAL FOR FRONTLINE EXTENSION AGENTS

Generating Revenues & Opportunities for Women to Improve Nutrition in Ghana (GROWING) Project
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02 Manual Instructions and Guidelines

03 Facilitative Guide for Learning Engagements

04 Facilitative Learning Engagement Modules for Nutritious Crops

05 Annex:
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B. Implementation timeline,
C. Assessment Tools,
D. Graphics
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Module 10 - Land Preparation & Transplanting
Module 17 - Triple S Method (Part 1)
Module 18 - Triple S Method (Part 2)
Module 22 - Proper Harvesting
Module 23 - Double S Technique for Storage

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CLIMATE-SMART PRACTICES
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Module 6 - Same Season Rotation
Module 7 - Intercropping
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Acknowledgements:

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Manual Cover Photo: Two Growing Futures Club members measuring Orange-fleshed Sweetpotato vine length on a varietal evaluation field in East Mamprusi District, Nalerigu. (Taken by: Abdul-Lateef Yakubu, CIP)
ABOUT THE GROWING PROJECT

Generating Revenues & Opportunities for Women to Improve Nutrition in Ghana (GROWING) is a 4 years and 9 months project that aims to improve nutritional and financial security of women, youth, and young children in 6 selected districts of Northern Ghana. GROWING is an integrated climate-smart agriculture-nutrition-marketing project with a strong emphasis on transforming individual agency and creating the enabling environment for women. Funded by Global Affairs Canada (GAC), the GROWING project led by the International Potato Center (CIP), and implemented in partnership with CARE International, the nutrition division of Ghana Health Services, local NGOs, and District-level Ministry of Food and Agriculture extension personnel and regional and district level agents of Women in Agricultural Development Directorate (WIAD). The project aims to reach at least 9,612 women of reproductive age and women from marginalized groups, 5,292 men (mostly spouses) and 7,560 children under five years of age.

The project activities are centered around three main objectives:

1. more equitable and enhanced nutrition for households especially for women and young children;
2. Increased control for women and youth on how revenue from sales of nutritious foods is utilized;
3. Improved support for a more inclusive, gender-equitable, nutritious, climate-smart, and resilient food system.

The agriculture component of the project focuses on climate resilient and sustainable production and postharvest management of nutritious crops such as vitamin A rich orange-fleshed sweetpotato (OFSP), calcium rich moringa, calcium rich and early maturing amaranth, vitamin C rich papaya (pawpaw), and protein-rich legumes (soybean and groundnuts).

MANUAL INSTRUCTIONS AND GUIDELINES

This agriculture training manual will serve the frontline agriculture extension staff mainly the Community-based Extension Agents (CBEAs) to enable them to encourage climate resilient and sustainable production techniques for nutrition crops through proper facilitation with Growing Future Clubs (GFCs). The manual has two intended purposes. The first is to provide the CBEAs with facilitation tools and guidance for learning engagements that will promote climate resilient practices and nutritious crops selected by the GROWING project. The second is to provide the Ministry of Food and Agriculture (MOFA) regional, district and sub-district level extension officers and other technical staff with a resource guide with technical briefs highlighting the promoted practices and crops so they can train frontline extension staff, such as CBEAs.

Training Approach:
This training manual focuses on the step-down training and facilitation techniques to be applied by Community-based Extension Agents (CBEAs) and other frontline extension agents who interface directly with and train farmers. The learning engagements were developed for key topics
important for Growing Futures Clubs who will be implementing climate resilient and sustainable production and postharvest practices for the selected nutritious crops.

The CBEAs are Community level volunteers, who are farmers themselves, identified by the project in a participatory process with the community, to become the local facilitators on improved and sustainable production and postharvest management techniques of nutritious crops. CBEAs receive training from the GROWING project team and district/sub-district level government extension staff on how to facilitate learning engagements to Growing Futures Club members and provide support to the project.

Overview of the Growing Futures Clubs (GFCs)

Groups of community members made up of approximately 30 households.

- GFCs are groups of approximately 30 households, prioritizing those with children under two years; then those with children under 5 years of age.
- GFC members will attend up to 28 learning engagements focusing on agriculture practices.

Gender Approach:

GROWING’s gender strategy and approaches are based on CARE’s Gender Equality Framework (GEF). Based on the results of the preliminary desk-based gender assessment, GROWING will focus on influencing gender dynamics, power relations and the gender-based inequalities that underpin the identified barriers. GROWING will aim to address key barriers around the gender norms, roles, relations, and structures that block women from being fully engaged in decisions on what food to grow and buy; those blocking women from increasing and sustaining crop productivity and having access to the revenue from crop and livestock sales; and those blocking women from engaging in agri-business. While the project focuses on gender as the most prevalent driver of inequality, an intersectional approach will be applied to the gender equality strategy and gender analysis. The project intends to use the pro-WEIA tool to identify barriers and will use this information to adapt the learning engagements to address these challenges.

Guidelines for Learning Engagements¹

Themes:
The Objectives for each learning engagement specify the purpose and most important topic/s to be covered during the learning engagement.

Specific Learning Objectives:
Key points that participants should be able to understand after completing each learning engagement.

Suggested Time (60-90 minutes):
Each learning engagement will not exceed 90 minutes to ensure that the scheduled training will not be a burden to the daily schedules of participants. Depending on learning engagement content and activities, some learning engagements may be shorter than 90 minutes.

¹The term “learning engagement” is used for the different training modules to highlight the facilitative, discussion-based approaches that value participants knowledge and encourage shared learning.
Location:
The location of the session will depend on the activities for that learning engagement and the topics being covered. Some learning engagements will take place at the selected demonstration plots where the GROWING project will demonstrate the climate resilient production techniques of the selected nutritious crops. Others will take place in a participant’s backyard, small plot for growing OFSP or central meeting location most convenient for all participants.

Materials Needed:
A list of tools and materials that are needed for each learning engagement. These include but are not limited to, visual aids, inputs such as inoculants, planting materials, farming and postharvest management tools and others. The GROWING project will supply OFSP vines, tree seedings for papaya and moringa, and seeds for amaranth to project participants. The CBEAs will also be provided with projectors to utilize for the training that requires showing videos. Participants will be responsible for bringing other materials specified in the materials needed section.

Facilitation Techniques:
The types of techniques used to encourage and guide group participation during each learning engagement.

Each Learning Engagement will have three main steps:

Step 1. Warm-up Activity/Pre-assessment:
This is the first activity done at the beginning of every learning engagement to welcome participants and check-in with everyone. The participants will be asked pre-assessment questions that will evaluate the group’s current understanding of the themes covered in each learning engagement. The questions will also help solicit farmers’ current knowledge of the topic and encourage farmers to share their experiences.

Specific to the GROWING Project - As participants arrive, their presence should be recorded by digital monitoring through scanning individual identification badges. If the badge is missing, the complete name and gender of the individual should be recorded.

Step 2. Main Activity:
This is the main part of each learning engagement. The topic of each learning engagement will be introduced, and any important technical concepts shared. This is also where participants will engage in participatory or hands-on learning exercises that allow participants to further apply and understand the topic being covered in each learning engagement. The learning engagements will be facilitated by using visual aids such as laminated graphics, audiovisuals, or practical field exercises whereby the participants themselves participate in the agricultural activities such as land preparation, planting and harvesting.

Step 3. Closing Activities/Post-assessment:
During the closing of each learning engagement the facilitator will do a recap of the key messages and will ask participants post-assessment questions to evaluate the group’s overall understanding of the content covered during each learning engagement. The participants will also have time to ask any questions that they may have and reflect on what they have learned.
A Key to Features of the Learning Engagements

Below is a key that explains different features found in the learning engagements.

- **Bolded and Italicized text** = what the facilitator should say
- Text in [….] = Instructions for the facilitator (do not read to participants)
- **Italicized text** = possible responses and guidance for questions

= Indicates where the facilitator speaks

= Indicates Pre- and Post- Assessment questions

= Indicates when participants should form a circle

= Indicates when participants should get into pairs

= Indicates when participants should form small groups of 3-4 people

= Indicates when the facilitator should use visual aid (laminated cards or video)

**Measurement References in Approximations:**

In cases where a tape measure or other formal measurement tools are unavailable, this manual provides the following approximations for the following measurements.

<table>
<thead>
<tr>
<th>Measurement Reference</th>
<th>Approximation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 stride = 1 meter</td>
<td></td>
</tr>
<tr>
<td>1 forearm = 30 cm</td>
<td></td>
</tr>
<tr>
<td>30 centimeters:</td>
<td></td>
</tr>
<tr>
<td>1 meter:</td>
<td></td>
</tr>
</tbody>
</table>
Technical Reference Materials:
This manual includes technical reference materials for each crop that can be used by extension staff with higher levels of literacy and agricultural knowledge. The technical reference materials for each nutritious crop can be found in ANNEX A.

Implementation Timeline:
The learning engagements have been developed to follow the agricultural season of each nutritious crop. A tentative timeline is included in ANNEX B.

FACILITATION GUIDE FOR LEARNING ENGAGEMENTS
It is important to keep in mind key adult learning approaches and good facilitation techniques to ensure that there is a positive and safe environment for learners to engage in new concepts, participate in activities and share experiences and learn from one another. All participants bring their own unique experiences and knowledge, and the learning engagements should be a space for them to openly discuss and share ideas. A list of adult learning approaches and facilitation techniques are listed below.
ADULT LEARNING TIPS

Adults learn best when...

1. learning through direct experience
2. learning from & with peers

3. feedback is provided
4. their experiences are valued

5. there is time to think & reflect
6. they can apply what they've learned
FACILITATION TIPS

Facilitators should keep these key techniques in mind when working with participants.

1. Establish a safe space for learning
2. Allow for interactive group discussions
3. Use small groups to involve everyone
4. Encourage teamwork
5. Show mutual respect and trust
6. Use open questions & give time to respond
FACILITATIVE LEARNING

ENGAGEMENT MODULES FOR

NUTRITIOUS CROPS
Module 1. Benefits and Challenges for Cultivating Orange-fleshed Sweetpotato

<table>
<thead>
<tr>
<th>Themes</th>
<th>Types of sweetpotatoes, orange-fleshed sweetpotato (OFSP) benefits, and production and post-harvest handling challenges.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suggested Time</td>
<td>60 Minutes</td>
</tr>
<tr>
<td>Location</td>
<td>Central place chosen by the community.</td>
</tr>
<tr>
<td>Materials Needed</td>
<td>Laminated card of OFSP varieties and challenges, sweetpotato vines and/or roots (OFSP, white-fleshed, and purple if available)</td>
</tr>
<tr>
<td>Facilitation Techniques</td>
<td>Discussion</td>
</tr>
</tbody>
</table>

Specific Learning Objectives:
By the end of this module participants will be able to:

- Differentiate between orange-flesh and white-flesh sweetpotato varieties
- List possible nutritional, socio-economic, and environmental benefits of OFSP
- Identify common production and post-harvest handling challenges of OFSP

Step 1: Warm-up Activity/Pre-assessment (15 minutes)
[Have the participants form a circle.] The facilitator should ask participants about their prior knowledge and experiences with growing, selling and consuming OFSP.

Welcome and thank you for joining today! We will be discussing the nutritional, socio-economic and environmental benefits of orange-fleshed sweetpotato. Please form a circle. I will ask you questions, and we will discuss answers as a group.

Question 1: Do you know the difference between Orange-fleshed Sweetpotato (OFSP) and White-flesh sweetpotato (WFSP)?

[Count the number of people that raise their hands and record on tablet]

Step 2: Main Activity (30 minutes)

Question: What is the difference between OFSP and WFSP?

Possible responses: The WFSP has white flesh while the OFSP has orange flesh. It is not the color of the peel, but the color of the flesh that matters.

Now we will discuss the different varieties of sweetpotatoes and production and post-harvest handling challenges of OFSP.
[Show laminated card of different sweetpotato varieties (OFSP, WFSP, purple) bring vines and roots of OFSP and pass it around, if available, so people can see and touch.]

Question: There are different types of sweetpotatoes. Who can tell me what variety is shown in #1, #2, #3, #4.…

Now we will discuss the nutritional, socio-economic and environmental benefits of OFSP.

What are some of the benefits of growing and consuming OFSP over other varieties?

Possible responses: OFSP has high nutritional value (contains vitamin A) which provides health benefits to my family, a way to earn small income, it is an early maturing and climate resilient crop.…

Now, we will discuss production and post-harvest handling challenges for OFSP.

What were some of the challenges you faced when trying to grow sweetpotatoes?

Possible responses: pests and diseases, lack of good plant material, drought stress, low productivity, no market…

[Show laminated card for OFSP production and post-harvest challenges and read the message on the back of the card.]
[Have participants form 4-5 groups.] **In your groups you will be doing a role-play activity. One of your neighbors who couldn’t attend the training is curious about what you learned. Role play what you would say to your neighbor to educate them about the benefits of OFSP and the production and post-harvest challenges of growing OFSP.**

After each group has had time to discuss, [ask each group to role play what they discussed.]

**Possible responses:** high in vitamin A, can be a source of income, some common challenges are lack of quality vines, soil quality, pests, diseases, lack of rain, and post-harvest losses.

[When the discussion is complete read the summary below.]

**Summary:** OFSP provides important nutrients for our bodies, like Vitamin A, which keeps our eyes strong, builds blood and keeps us from being sick. There are production and post-harvest challenges that are common when growing OFSP such as lack of quality vines, pests (like weevils), diseases, lack of rain or drought, post-harvest losses and lack of a good market. Learning new techniques can help address some of these challenges.

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2 Role Play Activity idea taken from MEDA Groundnut training
3 Taken from GROWING’s Quality Diets for Better Health: Growing Future Clubs Curriculum
Step 3: Closing Activities/Post-assessment (15 minutes)

Question 1: **How many of you can now identify the difference between OFSP and WFSP?**

[Count the number of people that raise their hands and record on tablet]

We will be ending today’s learning engagement. Before we do, what is one thing you learned today? [Give a chance for people to respond]

Great! Thank you for sharing. Does anyone have any questions? [Give time for people to ask questions. Make note of questions that you do not know the answers to and follow-up.] Thank you for participating today!
Module 2. Benefits and Challenges for Backyard Farming (Moringa, Papaya & Amaranth)

<table>
<thead>
<tr>
<th>Themes</th>
<th>Nutritional, socio-economic and environmental benefits of the selected crops (moringa, papaya, and amaranth) along with production and post-harvest handling challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suggested Time</td>
<td>60 Minutes</td>
</tr>
<tr>
<td>Location</td>
<td>Central place chosen by the community.</td>
</tr>
<tr>
<td>Materials Needed</td>
<td>Laminated cards on harvest and post-harvest challenges of papaya, moringa and amaranth; If available, bring leaves and seeds of crops.</td>
</tr>
<tr>
<td>Facilitation Techniques</td>
<td>Discussion</td>
</tr>
</tbody>
</table>

Specific Learning Objectives:
By the end of this learning engagement participants will be able to:

- List possible nutritional and socio-economic benefits of backyard tree crops (moringa & papaya) and amaranth
- Identify common production and post-harvest handling challenges of the backyard tree crops and amaranth

Step 1: Warm-up Activity/Pre-assessment (15 minutes)
[Have the participants form a circle.] The facilitator should use laminated cards as a guide and ask participants about their prior knowledge and experiences with growing, selling and consuming the selected crops.

Welcome and thank you for joining today! We will be discussing the nutritional and socio-economic benefits of moringa, papaya, amaranth. Please form a circle. I will ask you questions, and we will discuss answers as a group.

Question 1: **Who has grown moringa, papaya, or amaranth before?**
[Count the number of people that raise their hands and record on tablet]

Step 2: Main Activity (30 minutes)

Let's discuss the socio-economic and nutritional benefits of papaya, moringa and amaranth.

Question: **What are some of the nutritional and socio-economic benefits of growing and consuming these crops?**
Possible responses: Eating these crops provide health benefits for your family, papaya contains vitamin C which is good for healing wounds and maintaining healthy skin, moringa contains calcium, vitamin C &E and amaranth contains calcium which helps to make our bones and teeth strong, a way to earn small income, a way to contribute to my family and the community, ...

Now, we will discuss production and post-harvest handling challenges for moringa, papaya and amaranth.

What were some of the challenges you faced when trying to grow these crops?

Possible responses: pests and diseases, lack of good plant material, drought stress, low productivity, no market...

[show laminated card for backyard crops and read the message on the back of the card.] [Bring papaya, moringa, and amaranth leaves and seeds if available so people can see and touch.]

Front

Back

MODULE 2 – CHALLENGES FOR BACKYARD FARMING

1. Lack of access to seedlings or seeds of improved varieties of the backyard crops (e.g. papaya seedlings and Amaranth seeds).
2. Lack of knowledge and skills on proper management of backyard trees and vegetable crops (lack of fencing, improper water applications during the rainfall and dry seasons).
3. Pest damages on Amaranth vegetables (e.g. bugs and Aphids cause serious damage on amaranth)

[Have participants form 4-5 groups.] In your groups you will be doing a role-play activity. One of your neighbors who couldn’t attend the training is curious about what you learned. Role play what you would say to your neighbor to educate them about the benefits of backyard crops such as papaya, moringa and amaranth and the production and post-harvest challenges of growing each crop.

4 Taken from GROWING’s Quality Diets for Better Health: Growing Future Clubs Curriculum
After each group has had time to discuss, [ask each group to role play what they discussed.]

**Possible responses:**

**Papaya** - some common challenges are lack of availability of quality planting material of the desired varieties, pests, diseases, drought stress and lack of irrigation technologies during the dry season, post-harvest losses and improper storage practices...

**Moringa** – some common challenges are lack of seed and desired seed varieties, lack of proper tree management (e.g. pruning and backyard soil and water management), postharvest handling challenges and lack of a developed market for moringa products...

**Amaranth** – some common challenges are lack of availability of quality planting materials of the desired varieties, pests, diseases, drought stress and lack of irrigation technologies during the dry season, post-harvest losses, and improper storage practices...

[When the discussion is complete read the summary below.]

**Summary:** Eating papaya, moringa and amaranth provide nutritional benefits such as vitamin C, which helps us heal wounds and calcium which makes our bones and teeth strong. There are production and post-harvest challenges that are common among many crops such as lack of quality seeds, soil quality, pests, diseases, lack of rain, and post-harvest losses. Learning new techniques can help address some of these challenges.

**Step 3: Closing Activities/Post-assessment (15 minutes)**

**Question 1: Who is interested in growing moringa, papaya, or amaranth?**

[Count the number of people that raise their hands and record on tablet]

We will be ending today's learning engagement. Before we do, what is one thing you learned today? [Give chance for people to respond]

**Great! Thank you for sharing. Does anyone have any questions?** [Give time for people to ask questions. Make note of questions that you do not know the answers to and follow-up.] Thank you for participating today!
Module 3. Benefits and Challenges for Groundnut Cultivation

<table>
<thead>
<tr>
<th>Themes</th>
<th>Nutritional, socio-economic and environmental values of groundnuts and belong with common production and post-harvest handling challenges.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suggested Time</td>
<td>60 Minutes</td>
</tr>
<tr>
<td>Location</td>
<td>Central place chosen by the community.</td>
</tr>
<tr>
<td>Materials Needed</td>
<td>Laminated cards on production and post-harvest challenges for groundnuts</td>
</tr>
<tr>
<td>Facilitation Techniques</td>
<td>Discussion</td>
</tr>
</tbody>
</table>

**Specific Learning Objectives:**
By the end of this learning engagement participants will be able to:

- List possible socio-economic and nutritional values of the legumes such as groundnuts
- Identify common production and post-harvest handling challenges of groundnuts

**Step 1: Warm-up Activity/Pre-assessment (15 minutes)**

[Have the participants form a circle.] The facilitator should use laminated cards as a guide and ask participants about their prior knowledge and experiences with growing, selling and consuming the selected crops.

Welcome and thank you for joining today! We will be discussing the socio-economic and nutritional benefits of legumes such as groundnut. Please form a circle. I will ask you questions, and we will discuss answers as a group.

**Question 1: Who has grown groundnuts before?**

[Count the number of people that raise their hands and record on tablet]

**Step 2: Main Activity (30 minutes)**

We will now discuss the nutritional, socio-economic and environmental benefits of legumes such as groundnuts.

Question: What are some of the benefits of growing and consuming groundnuts?

Possible responses: Eating groundnuts provides your body with protein which is essential for building muscle and skin and helps children to grow well. It can also be a way to earn small income, improve soil fertility due to its nitrogen fixing characteristics...

---

5 The use of groundnut or soybean is dependent upon what the community has selected.
6 Taken from GROWING’s Quality Diets for Better Health: Growing Future Clubs Curriculum
Now, we will discuss production and post-harvest handling challenges for legumes such as groundnuts.

**Question:** What were some challenges you faced when growing groundnuts?

**Possible responses:** pests, lack of seeds, low productivity, no market...

[show laminated card for groundnuts and read the message on the back of the card.]

![Groundnut Production and Postharvest Challenges](image)

**Front**

**Back**

1. Lack of access to seeds of the improved varieties (early maturing and disease resistant).
2. Lack of access to biofertilizer (inoculants).
3. Aflatoxin infection.
4. Lack of proper drying of the ground nuts causing postharvest losses.
5. Lack of improved postharvest management and marketing techniques

[Have participants form 4-5 groups.] In your groups you will be doing a role-play activity. One of your neighbors who couldn’t attend the training is curious about what you learned. Role play what you would say to your neighbor to educate them about the benefits of groundnuts and the production and post-harvest challenges of growing them.

After each group has had time to discuss, [ask each group to role play what they discussed.]

**Possible responses:** Some common challenges are lack of quality seeds, soil quality, pests, diseases, lack of rain, and post-harvest losses.

[When the discussion is complete read the summary below.]
Summary: Eating groundnuts provides your body with health benefits like protein which is needed for building muscles and skin. There are production and post-harvest challenges that are common among groundnuts such as lack of quality seeds, soil quality, pests, diseases, lack of rain, and post-harvest losses. Learning new techniques can help address some of these challenges.

Step 3: Closing Activities/Post-assessment (15 minutes)

Question 1: **Who is interested in growing groundnuts now?**

[Count the number of people that raise their hands and record on tablet]

Question 2: **What are the benefits of producing groundnuts? (market, household consumption, both, soil fertility enhancement)?**

Possible responses: sell it in the market, household consumption, both, soil fertility

*We will be ending today’s learning engagement. Before we do, what is one thing you learned today?* [Give chance for people to respond]

*Great! Thank you for sharing. Does anyone have any questions?* [Give time for people to ask questions. Make note of questions that you do not know the answers to and follow-up.] *Thank you for participating today!*
Module 4. Benefits and Challenges in Soybean Cultivation

<table>
<thead>
<tr>
<th>Themes</th>
<th>Nutritional, socio-economic and environmental values of soybeans along with common production and post-harvest handling challenges.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suggested Time</td>
<td>60 Minutes</td>
</tr>
<tr>
<td>Location</td>
<td>Central place chosen by the community.</td>
</tr>
<tr>
<td>Materials Needed</td>
<td>Laminated cards on production and post-harvest challenges for soybean</td>
</tr>
<tr>
<td>Facilitation Techniques</td>
<td>Discussion</td>
</tr>
</tbody>
</table>

Specific Learning Objectives:
By the end of this learning engagement participants will be able to:

- List possible socio-economic and nutritional values of the legumes such as soybeans
- Identify common production and post-harvest handling challenges of soybeans

Step 1: Warm-up Activity/Pre-assessment (15 minutes)
[Have the participants form a circle.] The facilitator should use laminated cards as a guide and ask participants about their prior knowledge and experiences with growing, selling and consuming the selected crops.

Welcome and thank you for joining today! We will be discussing the socio-economic and nutritional benefits of legumes such as soybeans. Please form a circle. I will ask you questions, and we will discuss answers as a group.

Question 1: **Who has grown soybeans before?**
[Count the number of people that raise their hands and record on tablet]

Step 2: Main Activity (30 minutes)

We will now discuss the nutritional, socio-economic and environmental benefits of legumes.

Question: **What are some of the benefits of growing and consuming soybeans?**

Possible responses: Eating soybeans provides your body with protein which is essential for building muscle and skin and helps children to grow well, a way to earn small income, improve soil fertility due to its nitrogen fixing characteristics...

Now, we will discuss production and post-harvest handling challenges for legumes such as soybeans.

---

7 The use of groundnut or soybean is dependent upon what the community has selected.
8 Taken from GROWING’s Quality Diets for Better Health: Growing Future Clubs Curriculum
Question: *What were some challenges you faced when growing soybeans?*

Possible responses: pests, lack of seeds, low productivity, no market...

[show laminated card for soybeans and read the message on the back of the card.]

<table>
<thead>
<tr>
<th>Front</th>
<th>Back</th>
</tr>
</thead>
</table>
| ![Module 4 - Soybean Production and Postharvest Challenges](image) | 1. Lack of access to seeds of the improved varieties (early maturing and non-shattering).  
2. Lack of access to biofertilizer (inoculants).  
3. Early cessation of rainfall causing drought and hence, low yield.  
4. Lack of access to proper threshing technologies causing postharvest losses.  
5. Lack of improved postharvest management and marketing techniques. |

[Have participants form 4-5 groups.] *In your groups you will be doing a role-play activity. One of your neighbors who couldn’t attend the training is curious about what you learned. Role play what you would say to your neighbor to educate them about the benefits of soybeans and the production and post-harvest challenges of growing them.*

After each group has had time to discuss, [ask each group to role play what they discussed.]

Possible responses: Some common challenges are lack of quality seeds, soil quality, pests, diseases, lack of rain, and post-harvest losses.

[When the discussion is complete read the summary below.]
Summary: Eating soybeans provides your body with health benefits like protein which is needed for building muscles and skin. There are production and post-harvest challenges that are common among growing soybeans such as lack of quality seeds, soil quality, pests, diseases, lack of rain, and post-harvest losses. Learning new techniques can help address some of these challenges.

Step 3: Closing Activities/Post-assessment (15 minutes)

Question 1: **Who is interested in growing soybeans now?**

[Count the number of people that raise their hands and record on tablet]

Question 2: **What are the benefits of producing soybeans? (market, household consumption, both, soil fertility enhancement)?**

Possible responses: sell it in the market, household consumption, both, soil fertility

We will be ending today’s learning engagement. Before we do, what is one thing you learned today? [Give chance for people to respond]

Great! Thank you for sharing. Does anyone have any questions? [Give time for people to ask questions. Make note of questions that you do not know the answers to and follow-up.] Thank you for participating today!
Module 5. Composting for Organic Fertilizer

**Themes**
Using locally available materials to prepare organic fertilizer that is economically and environmentally sound using surface level composting approach.¹⁹

**Suggested Time**
1 hour and 30 minutes

**Location**
SAWBO translated video of composting¹⁰, Backyard garden belonging to a GFC member or demonstration site

**Materials Needed**
Laminated card on composting, shovel, forked hoe, raw composting (yard waste, kitchen scraps, etc.) materials, hose/bucket for water, soil

**Facilitation Techniques**
Discussion, experiential learning

**Specific Learning Objectives:**
By the end of this learning engagement participants will be able to:

- List key benefits of composting
- Identify the materials needed for surface level composting
- Demonstrate how to establish surface level composting

**Step 1: Warm-up Activity/Pre-assessment (15 minutes)**
[Have the participants form a circle.] The facilitator should ask participants about their prior knowledge and experiences with composting and using compost in their own fields.

**Welcome and thank you for joining today! We will be discussing how you can make your own compost and use it as organic fertilizer. For our next activity please form a circle. I will ask you some questions and we will discuss the answers as a group.**

**Question 1:** How many of you have made your own compost?
[Count the number of people that raise their hands and record on tablet]

**Question 2:** What are the benefits of making your own compost and using it?

**Possible responses:** Compost helps to improve soil structure and increases nutrients in soil; Its good for the environment; low-cost/no cost to make your own compared to the increasing costs of chemical fertilizers; economic benefits of selling compost...

---

¹⁹ Concepts taken from CARE’s FFBS Agricultural Tools lesson on “compost manure preparation”

¹⁰ The video link and graphics used for the accompanying laminated card were adapted from Scientific Animations Without Borders (SAWBO) “Survival Gardening: How to Create Compost” (2D & 3D) videos.
Step 2: Main Activity (1 hour)

Now I will share with you some important steps for composting.

Question 1: What are the benefits of compost in improving soil health?

Possible responses: Healthy soil has high water infiltration, it has good nutrients for crops, it improves agriculture productivity, less inputs are needed if soil is healthy.

[Set-up of project and play the SAWBO video on “Survival Gardening: How to Create Compost” linked below.]

Video Link: https://sawbo-animations.org/228

[show laminated card with compost graphic and read the message on the back of the card.]

<table>
<thead>
<tr>
<th>Front</th>
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<tbody>
<tr>
<td>MODULE 5 - PROCEDURES FOR THE PREPARATION OF COMPOST</td>
<td></td>
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</tbody>
</table>

1. Prepare the necessary ingredients for the compost preparation such as crop residues (green and dry materials), Soil or termite mounds, Animal droppings (poultry, goats or cattle manure) including kitchen left over dried organic matter, etc.
2. Prepare a surface layer with sticks or maize stalks and prepare a rectangular or square trench to drain the excess water down.
3. Put them in layers adding water before the next layer.
4. Add water once every week for the first two months.
5. After three months, you need to turn the layers upside down to mix the materials.
6. Wait for more weeks or months to complete the decomposition and get the compost ready to use.

Now we will be following these steps to make our own compost together. We will start by identifying a site for composting.

11 Ibid.
[After site has been selected use the laminated card to discuss each step for composting. CBEA demonstrates then asks GFC members to participate.]

Discuss the following points as the activity is being demonstrated.

- **What can you add to your surface level compost?** (green layer and brown layer)
  - Possible responses: Green layer – animal manure, green plant materials, food scraps, but **NO** meat scraps because that can attract unwanted pests. Brown layer – dry plant material, soil, sticks
- **What do you do if your compost heap is too dry or too wet?**
  - If too dry add more water, if too wet add dry plant materials like grass clippings

[When the discussion is complete read the summary below.]

Summary: *Using compost is a simple, low-cost way to improve nutrients in the soil.*

---

**Step 3: Closing Activities/Post-assessment (15 minutes)**

**Question 1:** *How many of you are now interested in making your own compost at home?*

[Count the number of people that raise their hands and record on tablet]

**Question 2:** *What are the steps to making compost?* [Call on different people to name each step. Give a chance for people to respond]

*We will be ending today’s learning engagement. Before we do, what is one thing you learned today?* [Give a chance for people to respond]

_Great! Thank you for sharing. Does anyone have any questions?_ [Give time for people to ask questions. Make note of questions that you do not know the answers to and follow-up.] *Thank you for participating today!*_
Module 6. Same Season Rotation of Groundnuts with Orange-fleshed Sweetpotato

<table>
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<tr>
<th>Themes</th>
<th>Benefits of same season rotation using groundnuts and OFSP</th>
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<tbody>
<tr>
<td>Suggested Time</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Location</td>
<td>Central place chosen by the community</td>
</tr>
<tr>
<td>Materials Needed</td>
<td>Laminated card on same season rotation of groundnuts with OFSP</td>
</tr>
<tr>
<td>Facilitation Techniques</td>
<td>Discussion</td>
</tr>
</tbody>
</table>

Specific Learning Objectives:
By the end of this learning engagement participants will be able to:

- List key benefits of same season rotation
- List the key steps for same season rotation

Step 1: Warm-up Activity/Pre-assessment (15 minutes)
[Have the participants form a circle.] The facilitator should ask participants about their prior knowledge and experiences with same season rotation in their own fields.

Welcome and thank you for joining today! Today we will be discussing same season rotation with groundnuts and OFSP. Please form a circle. I will ask you some questions and we will discuss the answers as a group.

Question 1: How many of you plant other crops after harvesting groundnuts in the same growing season?

[Count the number of people that raise their hands and record on tablet]

Question 2: What crops do you grow after harvesting groundnuts?
Possible responses: cowpea, soybeans, maize, groundnuts, sweetpotato...

Step 2: Main Activity (20 minutes)

Now we will discuss same season rotation of groundnuts with orange-fleshed sweetpotatoes.

Question: What are the benefits and challenges of growing groundnuts followed by OFSP for same season rotation?
Possible responses: two crops to consume and sell in one season, increased yields, improved soil health, reduces costs needed for inputs such as fertilizers... challenges – if rainfall doesn’t come early enough, cannot plant groundnuts early enough.

[show laminated card with same season rotation graphic and read the message on the back of the card.]

**Front**

**Back**

1. Plant early maturing groundnut variety using the early rainfall in March/April/early May.
2. Harvest the groundnut in July/early August and plant OFSP immediately. Harvest the OFSP in November/December.

[Have participants form pairs.] **Please discuss the benefits of same season rotation of groundnuts and OFSP and important considerations.**

[After each pair has had time to discuss, ask 3-4 pairs to share what they learned.]

Possible responses: Timing of planting is important – must plant early. Soil health can be improved because groundnuts are a nitrogen fixing crop.

[When the discussion is complete read the summary below.]

Summary: **Same season rotation can be very beneficial. It allows you to grow and harvest two crops on the same land in one year while also improving soil health.**
Step 3: Closing Activities/Post-assessment (10 minutes)

Question 1: How many of you will try same season rotation of groundnuts with OFSP next growing season?

[Count the number of people that raise their hands and record on tablet]

Question 2: When should you plant groundnuts for same season rotation?

Answer: March-early May

We will be ending today’s learning engagement. Before we do, what is one thing you learned today? [Give a chance for people to respond]

Great! Thank you for sharing. Does anyone have any questions? [Give time for people to ask questions. Make note of questions that you do not know the answers to and follow-up.] Thank you for participating today!
Module 7. Intercropping of Soybeans with Maize

<table>
<thead>
<tr>
<th>Themes</th>
<th>Benefits of intercropping soybeans with maize</th>
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</thead>
<tbody>
<tr>
<td>Suggested Time</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Location</td>
<td>Central place chosen by the community</td>
</tr>
<tr>
<td>Materials Needed</td>
<td>Laminated card on intercropping of soybeans and Maize</td>
</tr>
<tr>
<td>Facilitation Techniques</td>
<td>Discussion</td>
</tr>
</tbody>
</table>

Specific Learning Objectives:
By the end of this learning engagement participants will be able to:

- List key benefits of intercropping of soybeans with maize
- List the key steps for intercropping soybeans with maize

Step 1: Warm-up Activity/Pre-assessment (15 minutes)
[Have the participants form a circle.] The facilitator should ask participants about their prior knowledge and experiences with intercropping in their own fields.

Welcome and thank you for joining today! Today we will be discussing intercropping soybeans with maize. Please form a circle. I will ask you some questions and we will discuss the answers as a group.

Question 1: How many of you plant soybeans with maize sided-by-side on the same field in the same growing season?
[Count the number of people that raise their hands and record on tablet]

Question 2: What are the benefits of intercropping soybeans with maize?
Possible responses: Benefits - two crops to consume and sell in one season, crop diversification to reduce risks of relying on only one crop, increased yields of maize due to effects from nitrogen fixing by soybeans, improved soil health, reduces costs needed for inputs such as fertilizers;

Step 2: Main Activity (20 minutes)
Now we will discuss intercropping of soybeans with maize.

[show laminated card with intercropping graphic and read the message on the back of the card.]
[Have participants form pairs.] **With the person next to you discuss the benefits of intercropping of soybeans with maize and important considerations.**

[After each pair has had time to discuss, ask 3-4 pairs to share what they learned.]

Possible responses: The timing of planting is important. Soil health can be improved because soybeans are a nitrogen fixing crop.

[When the discussion is complete read the summary below.]

Summary: **Intercropping can be very beneficial. It allows you to grow and harvest two crops at the same time on the same land in one year while also improving soil health.**

Step 3: Closing Activities/Post-assessment (10 minutes)

- **Question 1:** *Who plans to intercrop soybeans and maize next growing season?*
  
  [Count the number of people that raise their hands and record on tablet]

  *We will be ending today’s learning engagement. Before we do, what is one thing you learned today?* [Give chance for people to respond]

  **Great! Thank you for sharing. Does anyone have any questions?** [Give time for people to ask questions. Make note of questions that you do not know the answers to and follow-up.] **Thank you again for participating today!**
Module 8. Environmentally Aware Land Preparation for Legume Crops

<table>
<thead>
<tr>
<th>Themes</th>
<th>Site selection for groundnuts or soybeans and effects of deforestation and crop residue burning.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suggested Time</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Location</td>
<td>Demonstration site</td>
</tr>
<tr>
<td>Materials Needed</td>
<td>Laminated cards on site selection and land management practices</td>
</tr>
<tr>
<td>Facilitation Techniques</td>
<td>Discussion</td>
</tr>
</tbody>
</table>

Specific Learning Objectives:
By the end of this learning engagement participants will be able to:

- List important criteria to consider when selecting a site to grow legume crops.
- List impacts of deforestation and crop residue burning on the environment.

Step 1: Warm-up Activity/Pre-assessment (15 minutes)
[Have the participants form a circle.] The facilitator should ask participants about their prior knowledge and experience with site selection and land preparation.

Welcome and thank you for joining today! Today we will be discussing how to select a proper site for growing legumes and the impacts of different land preparation approaches. Please form a circle. I will ask you some questions and we will discuss the answers as a group.

Question 1: How many of you cut down trees or practice deforestation when picking a site to grow legumes?
[Count the number of people that raise their hands and record on tablet]

Why?
Possible responses: land must be cleared so I have more space to grow legumes, the land obtained from deforestation is fertile, I do not know the consequences, etc.

Question 2: How many of you burn crop residue to prepare your field for growing legumes?
[Count the number of people that raise their hands and record on tablet]

Why?
Possible responses: To make catching rodents for bush meat easy, it’s an easy and cheap way to clear the land, ...
Step 2: Main Activities (20 minutes)

Today we will be discussing things to consider when picking where to grow groundnuts (or) soybeans.

What things should you consider when selecting and preparing land to grow groundnuts (or) soybeans?¹²?

Possible responses: the type of soil, topography, susceptibility of flooding, forest or natural vegetation, access to water/irrigation...

(show laminated card with site selection graphic and read the message on the back of the card.)

[Have participants form pairs.]

With the person next to you discuss the following questions:

What are the negative side effects of deforestation?

Possible responses: it ruins soil health by getting rid of trees...

What are the negative side effects of crop residue burning?

Possible responses: it ruins soil health by getting rid of beneficial organisms in soil...

¹²The use of groundnut or soybean will depend on the community.
[After each pair has had time to discuss, ask 3-4 pairs to share what they learned.]

[When the discussion is complete read the summary below.]

SUMMARY: When you are selecting a site to grow groundnuts (or) soybeans it is important to find a place that has no (or very few) trees to ensure you don’t have to cut them down. You should also avoid burning the crop residue as it is bad for the soil.

Step 3: Closing Activities/Post-assessment (10 minutes)

Question 1: How many of you will still continue to burn crop residues?
[Count the number of people that raise their hands and record on tablet]

Question 2: How many of you will continue cutting trees as part of land preparation?
[Count the number of people that raise their hands and record on tablet]

We will be ending today’s learning engagement. Before we do, what is one thing you learned today? [Give chance for people to respond]

Great! Thank you for sharing. Does anyone have any questions? [Give time for people to ask questions. Make note of questions that you do not know the answers to and follow-up.] Thank you again for participating today!
Module 9. Land Preparation and Fencing for Backyard Tree Crops (Papaya & Moringa)

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<th>Themes</th>
<th>Land preparation and backyard fencing techniques for tree crops</th>
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<tr>
<td>Suggested Time</td>
<td>60 Minutes</td>
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<tr>
<td>Location</td>
<td>Backyard garden belonging to a GFC member</td>
</tr>
<tr>
<td>Materials Needed</td>
<td>Laminated cards, fencing materials, hoe, 1 m stick and 30 cm stick</td>
</tr>
<tr>
<td>Facilitation Techniques</td>
<td>Discussion, demonstration, experiential learning</td>
</tr>
</tbody>
</table>

Specific Learning Objectives:
By the end of this learning engagement participants will be able to:

- List key techniques for backyard land preparation and fencing.
- Demonstrate their understanding of land preparation and fencing techniques by implementing them in their own backyards.

Step 1: Warm-up Activity/Pre-assessment (15 minutes)
[Have the participants form a circle.] The facilitator should ask participants about their prior knowledge and experiences with backyard gardening.

**Welcome and thank you for joining today! Today we will be discussing land preparation and fencing for backyard gardens. Please form a circle. I will ask you some questions and we will discuss the answers as a group.**

**Question 1:** How many of you have a backyard garden for tree crops? [Count the number of people that raise their hands and record on tablet]

**Question 2:** What are some things that you typically plant in your backyard gardens? Possible responses: papaya, moringa, amaranth, sweetpotatoes...

Step 2: Main Activity (35 minutes)

**Today we will be discussing how to prepare your backyard for growing tree crops like papaya and moringa. These are some things you should consider.**

**Question:** How do you decide where to plant your backyard crops? Do you fence your backyard garden? Possible responses: next to bathroom so there is water, wherever there is space...
[show laminated card for backyard land preparation and fencing and read the message on the back of the card.]

Now we will be practicing in your backyard. When picking a place for your garden it should be a place with good sunlight, close to your house, have enough space for seedlings, close to a water source but not where soil is too wet.

When fencing you should use materials that are available to you such as sticks or wood scraps, and it should protect the bottom from any animals.

[When the discussion is complete read the summary below.]

Summary: Land preparation and fencing are important for backyard gardening. You should pick a place that is not too waterlogged and has good sunlight. Fencing should cover space big enough, so plants are not too close and to protect all seedlings from animals.

Step 3: Closing Activities/Post-assessment (10 minutes)

Question 1: How many of you are now interested in establishing a backyard garden for tree crops?

[Count the number of people that raise their hands and record on tablet]
We will be ending today’s learning engagement. Before we do, what is one you learned today? [Give chance for people to respond.]

Great! Thank you for sharing. Does anyone have any questions? [Give time for people to ask questions. Make note of questions that you do not know the answers to and follow-up.] Thank you again for participating today!
Module 10. Land Preparation and Transplanting of Orange-fleshed Sweetpotato

<table>
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<tr>
<th>Themes</th>
<th>Land preparation and transplanting techniques for OFSP using ridges</th>
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<tr>
<td>Suggested Time</td>
<td>60 Minutes</td>
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<tr>
<td>Location</td>
<td>Demonstration plot or individual OFSP farm plot</td>
</tr>
<tr>
<td>Materials Needed</td>
<td>Laminated cards, hoe, OFSP vines, 1 m stick and 30 cm stick (if available)</td>
</tr>
<tr>
<td>Facilitation Techniques</td>
<td>Discussion, demonstration, experiential learning</td>
</tr>
</tbody>
</table>

Specific Learning Objectives:
By the end of this learning engagement participants will be able to:

- List key steps in land preparation for growing OFSP.
- Explain the proper techniques for planting OFSP vines.
- Demonstrate their understanding of land preparation techniques for OFSP using ridges by implementing them in their own backyards.

Step 1: Warm-up Activity/Pre-assessment (15 minutes)
[Have the participants form a circle.] The facilitator should ask participants about their prior knowledge and experience with growing sweetpotato/OFSP.

Welcome and thank you for joining today! Today we will be discussing land preparation and transplanting of OFSP. Please form a circle. I will ask you some questions and we will discuss the answers as a group.

Question 1: *Do you know the proper land preparation technique (ridge making) to grow OFSP?*

[Count the number of people that raise their hands and record on tablet]

Question 2: *Do you know the steps for proper transplanting of OFSP?*

[Count the number of people that raise their hands and record on tablet]

Step 2: Main Activity\(^{13}\) (35 minutes)

Today we will be discussing land preparation and planting techniques for growing OFSP using ridges.

\(^{13}\) The GROWING Project distributes 300 OFSP vines to each GFC household.
[show laminated cards for proper land preparation for OFSP and read the message on
the back of the card.]

Now we will practice these techniques together in your backyard OFSP plot.

[Follow steps on laminated cards to prepare land for growing OFSP]

[When the activity and discussion are complete read the summary below.]

Summary: It is important to use proper land preparation techniques for growing
OFSP. Having good spacing between ridges or mounds along with the proper height
is important to ensure there is proper drainage and aeration. Transplanting of OFSP
vines must happen as soon as possible after cuttings are received so they can continue to grow
in new conditions.

Step 3: Closing Activities/Post-assessment (10 minutes)

Question 1: Do you know the procedure for proper land preparation for OFSP
planting?
[Count the number of people that raise their hands and record on tablet]

Question 2: Who now understands the steps for land preparation and transplanting
OFSP vines? Who can tell us the steps?
[Count the number of people that raise their hands and record on tablet]
We will be ending today’s learning engagement. Before we do, what is one thing you learned today? [Give chance for people to respond]

Great! Thank you for sharing. Does anyone have any questions? [Give time for people to ask questions. Make note of questions that you do not know the answers to and follow-up.] Thank you again for participating today!
Module 11. Planting of Groundnuts with Inoculants

<table>
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<tr>
<th>Themes</th>
<th>Proper use of inoculants (biofertilizers) for improved and sustainable groundnut production</th>
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<tr>
<td>Suggested Time</td>
<td>60 Minutes</td>
</tr>
<tr>
<td>Location</td>
<td>Demonstration site</td>
</tr>
<tr>
<td>Materials Needed</td>
<td>Laminated cards, seeds inoculants, hoe</td>
</tr>
<tr>
<td>Facilitation Techniques</td>
<td>Discussion, experiential learning</td>
</tr>
</tbody>
</table>

Specific Learning Objectives:
By the end of this learning engagement participants will be able to:

- List the benefits of using inoculants when planting groundnuts.
- Demonstrate the steps for appropriate inoculant application at the demonstration site.

Step 1: Warm-up Activity/Pre-assessment (15 minutes)
Have the participants form a circle. The facilitator should ask participants about their prior knowledge and experience with bio-fertilizer or inoculant application.

Welcome and thank you for joining today! Today we will be discussing the use of bio-fertilizers like use of inoculants for groundnut seeds. Please form a circle. I will ask you some questions and we will discuss the answers as a group.

Question 1: Who has applied biofertilizer (inoculants) for groundnuts before?

[Count the number of people that raise their hands and record on tablet]

Question 2: Do you know the procedures for application of innoculants (biofertilizers)?

[Count the number of people that raise their hands and record on tablet]

Step 2: Main Activity (35 minutes)

Today we will be discussing the planting of groundnuts using inoculants for same-season rotation.

[show laminated card with groundnut inoculant graphic and read message on the back of card.]
Now we will practice these techniques together on the demonstration site.

[Follow steps on laminated cards for groundnut inoculation]

[Once the activity is complete read the summary below.]

**Summary:** The proper use of inoculants when planting groundnuts can help add healthy bacteria to the soil, improving soil quality and increasing yields.

**Step 3: Closing Activities/Post-assessment (10 minutes)**

- **Question 1:** How many of you will now apply inoculants for growing groundnuts?
  
  [Count the number of people that raise their hands and record on tablet]

- We will be ending today’s learning engagement. Before we do, what is one thing you learned today? [Give chance for people to respond]

*Great! Thank you for sharing. Does anyone have any questions? [Give time for people to ask questions. Make note of questions that you do not know the answers to and follow-up.] Thank you again for participating today!*
Module 12. Amaranth Seedling Production in Raised Soil Beds

<table>
<thead>
<tr>
<th>Themes</th>
<th>Planting of amaranth seeds in raised soil beds to produce seedlings for transplanting.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suggested Time</td>
<td>60 Minutes</td>
</tr>
<tr>
<td>Location</td>
<td>Backyard garden belonging to a GFC member</td>
</tr>
<tr>
<td>Materials Needed</td>
<td>Laminated cards, amaranth seeds, hoe</td>
</tr>
<tr>
<td>Facilitation Techniques</td>
<td>Discussion, demonstration, experiential learning.</td>
</tr>
</tbody>
</table>

Specific Learning Objectives:
By the end of this learning engagement participants will be able to:

- List key benefits of nursing and growing amaranth in a sterilized seedbed instead of broadcasting seed for direct seeding.
- Identify the key procedures for growing and getting healthy and strong seedlings.

Step 1: Warm-up Activity/Pre-assessment (15 minutes)
[Have the participants form a circle.] The facilitator should ask participants about their prior knowledge and experiences with growing amaranth.

Welcome and thank you for joining today! Today we will be discussing growing amaranth seedlings in raised beds. Please form a circle. I will ask you some questions and we will discuss the answers as a group.

Question 1: How many people grow amaranth seeds in raised beds?
[Count the number of people that raise their hands and record on tablet]

Question 2: How do you typically plant amaranth seeds?
Possible responses: scatter seeds in backyard, growing seeds in seedbed or trays, etc.

Step 2: Main Activity (35 minutes)
Today we will be discussing the planting of amaranth in raised soil beds.

Question: What are some challenges with growing amaranth and how do you address them?

---

The GROWING Project distributes 15g of amaranth seeds to each GFC household.
Possible responses: germination rate – I address this by buying extra seeds; good seeds not accessible – I address this by trying to save seeds.

[show laminated card for planting amaranth seeds in raised beds and read message on the back of card.]

Now we will practice these techniques together in your backyard.

[Follow steps on laminated cards for planting amaranth in raised beds]

[When the activity is complete read the summary below.]

Summary: Planting amaranth in raised beds after sterilizing the soil and covering planted seeds with plant materials can help with germination rates and improve yields.

Step 3: Closing Activities/Post-assessment (10 minutes)

Question 1: How many people are now interested in growing amaranth in raised beds? [Count the number of people that raise their hands and record on tablet]

We will be ending today’s learning engagement. Before we do, what is one thing you learned today? [Give chance for people to respond]

Great! Thank you for sharing. Does anyone have any questions? [Give time for people to ask questions. Make note of questions that you do not know the answers to and follow-up.] Thank you again for participating today!
**Module 13. Planting of Soybeans with Inoculants**

<table>
<thead>
<tr>
<th>Themes</th>
<th>Proper use of inoculants (biofertilizers) for improved and sustainable soybean production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suggested Time</td>
<td>60 Minutes</td>
</tr>
<tr>
<td>Location</td>
<td>Demonstration plot</td>
</tr>
<tr>
<td>Materials Needed</td>
<td>Laminated cards, seeds, inoculants, hoe</td>
</tr>
<tr>
<td>Facilitation Techniques</td>
<td>Discussion, demonstration, experiential learning</td>
</tr>
</tbody>
</table>

**Specific Learning Objectives:**
By the end of this learning engagement participants will be able to:

- List the benefits of using inoculants when planting soybeans.
- Demonstrate their understanding of the steps required for appropriate inoculant application at the demonstration site.

**Step 1: Warm-up Activity/Pre-assessment (15 minutes)**
[Have the participants form a circle.] The facilitator should ask participants about their prior knowledge and experience with bio-fertilizer or inoculant application.

*Welcome and thank you for joining today! Today we will be discussing the use of bio-fertilizers like the use of inoculants for soybean seeds. Please form a circle. I will ask you some questions and we will discuss the answers as a group.*

**Question 1:** Who has applied biofertilizer (inoculants) for soybeans before?
[Count the number of people that raise their hands and record on tablet]

**Question 2:** What type of fertilizers do you use for soybeans?
*Possible responses: Chemical fertilizers, organic fertilizers, inoculants, none, a combination, etc.*

**Step 2: Main Activity (35 minutes)**

*Today we will be discussing the planting of soybeans using inoculants.*

[show laminated card with soybean inoculant graphic and read message on back of card]
Now we will practice these techniques together on the demonstration site.

[Follow steps on laminated cards for soybean inoculation]

[Once the activity is complete read the summary below.]

Summary: The proper use of inoculants during planting of soybeans can help add beneficial bacteria to the soil improving soil quality, root formation and increasing yields.

Step 3: Closing Activities/Post-assessment (10 minutes)

Question 1: How many of you will apply inoculants for growing soybeans?

[Count the number of people that raise their hands and record on tablet]

We will be ending today’s learning engagement. Before we do, what is one thing you learned today? [Give chance for people to respond]

Great! Thank you for sharing. Does anyone have any questions? [Give time for people to ask questions. Make note of questions that you do not know the answers to and follow-up.] Thank you again for participating today!
Module 14. Transplanting of Tree Seedlings (Moringa and Papaya)

<table>
<thead>
<tr>
<th>Themes</th>
<th>Techniques for transplanting moringa and papaya seedlings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suggested Time</td>
<td>60 Minutes</td>
</tr>
<tr>
<td>Location</td>
<td>Backyard garden belonging to a GFC member</td>
</tr>
<tr>
<td>Materials Needed</td>
<td>Laminated cards, tree seedlings</td>
</tr>
<tr>
<td>Facilitation Techniques</td>
<td>Discussion, demonstration, experiential learning</td>
</tr>
</tbody>
</table>

Specific Learning Objectives:
By the end of this learning engagement participants will be able to:

- Explain the procedures for making zai pits for planting, including proper spacing.
- Plant moringa and papaya tree seedlings in the prepared pits.

Step 1: Warm-up Activity/Pre-assessment (15 minutes)
Have the participants form a circle. The facilitator should ask participants about their prior knowledge and experience with transplanting moringa and papaya seedlings.

Welcome and thank you for joining today! Today we will be discussing proper techniques for transplanting moringa and papaya seedlings. I will ask you some questions and we will discuss the answers as a group.

Question 1: Who has transplanted moringa or papaya seedlings before?
[Count the number of people that raise their hands and record on tablet]

Question 2: What are some challenges in planting moringa and papaya?
Possible responses: access to quality seedlings, water especially during dry season, pests, and diseases...

Step 2: Main Activity (35 minutes)
Today we will be discussing the transplanting of moringa and papaya seedlings.

What are important considerations when planting tree seedlings such as moringa and papaya?
Possible responses: appropriate spacing, soil type, timing of planting, location of nearest water source (especially in dry season)...

The GROWING Project distributes 2 papaya and 3 moringa seedlings to each GFC household.
Now we will practice these techniques together in your backyard garden.

[Follow steps on laminated cards for moringa and papaya transplanting]

[Demonstrate the practice at one backyard garden then have participants practice. Go to 2-3 backyards if possible.]

[Once the activity is complete read the summary below.]

Summary: *It is important to use proper techniques when transplanting moringa and papaya to ensure the seedling survive in their new conditions.*

Step 3: Closing Activities/Post-assessment (10 minutes)

Question 1: *How many of you are able to transplant tree seedlings properly by yourself?*

[Count the number of people that raise their hands and record on tablet]

*We will be ending today’s learning engagement. Before we do, what is one thing you learned today?* [Give chance for people to respond]

Great! *Thank you for sharing. Does anyone have any questions?* [Give time for people to ask questions. Make note of questions that you do not know the answers to and follow-up.] *Thank you again for participating today!*
Module 15. Use of Neem for Pest Prevention and Control

<table>
<thead>
<tr>
<th>Themes</th>
<th>Preparation and application procedures of neem leaves and seeds for pest prevention and control.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suggested Time</td>
<td>60 Minutes</td>
</tr>
<tr>
<td>Location</td>
<td>Backyard garden belonging to a GFC member</td>
</tr>
<tr>
<td>Materials Needed</td>
<td>Laminated cards, neem</td>
</tr>
<tr>
<td>Facilitation Techniques</td>
<td>Discussion</td>
</tr>
</tbody>
</table>

Specific Learning Objectives:
By the end of this learning engagement participants will be able to:

- Demonstrate how to prepare and use neem leaves and seeds for pest and disease prevention and control
- List benefits of using more environmentally aware pest and disease prevention and control techniques

Step 1: Warm-up Activity/Pre-assessment (15 minutes)
[Have the participants form a circle.] The facilitator should ask participants about their prior knowledge and experience with using neem powder to control and manage pests and diseases.

Welcome and thank you for joining today! Today we will be discussing the use of neem powder for pest and disease prevention. I will ask you some questions and we will discuss the answers as a group.

Question 1: How many of you have used neem leaves or seeds to prevent and control pests before?
[Count the number of people that raise their hands and record on tablet]

Question 2: How many of you are using chemical to prevent and control pests and diseases?
[Count the number of people that raise their hands and record on tablet]

Step 2: Main Activity (35 minutes)

Today we will be discussing the use of neem powder for pest and disease prevention.
[show laminated card with techniques for using neem powder and read message on back of card.]

[***Insert laminated card when complete – under development by project team]

Front of card includes graphics, back of card includes text.

[Follow steps on laminated cards for showing techniques for using neem powder]

[Once the activity is complete read the summary below.]

Summary: Using neem powder is an easy, environmentally friendly, and affordable way to prevent and control pests and diseases.

Step 3: Closing Activities/Post-assessment (10 minutes)

Question 1: How many of you plan to use neem powder to control pests and diseases in the future? [Count the number of people that raise their hands and record on tablet]

We will be ending today’s learning engagement. Before we do, what is one thing you learned today? [Give chance for people to respond]

Great! Thank you for sharing. Does anyone have any questions? [Give time for people to ask questions. Make note of questions that you do not know the answers to and follow-up.] Thank you again for participating today!
Module 16. Harvesting and Post-harvest Handling of Groundnuts

<table>
<thead>
<tr>
<th>Themes</th>
<th>Proper harvesting and post-harvest handling practices such as drying, threshing and storage techniques for groundnuts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suggested Time</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Location</td>
<td>Backyard garden belonging to a GFC member</td>
</tr>
<tr>
<td>Materials Needed</td>
<td>Laminated cards</td>
</tr>
<tr>
<td>Facilitation Techniques</td>
<td>Discussion</td>
</tr>
</tbody>
</table>

Specific Learning Objectives:
By the end of this learning engagement participants will be able to:

- Demonstrate their understanding of proper harvesting and post-harvest handling techniques for groundnuts.

Step 1: Warm-up Activity/Pre-assessment (15 minutes)
[Have the participants form a circle.] The facilitator should ask participants about their prior knowledge and experience with drying, threshing and storage for groundnuts.

Welcome and thank you for joining today! Today we will be discussing proper harvesting and post-harvest handling techniques for groundnuts. I will ask you some questions and we will discuss the answers as a group.

Question 1: How many of you typically use threshing machines for harvesting groundnuts?
[Count the number of people that raise their hands and record on tablet]

Question 2: What techniques do you typically use for post-harvest handling of groundnuts?
Possible responses: appropriate spacing, soil type, timing of planting, location of nearest water source (especially in dry season)...

Step 2: Main Activity (20 minutes)
Today we will be discussing different harvesting and post-harvest handling techniques for groundnuts.
Now we will practice these techniques together on the demonstration site.

[Demonstrate the techniques listed on the laminated card for harvesting and post-harvest handling techniques for groundnuts and ask volunteers]

Summary: *It is important to understand the best time to harvest groundnuts along with checking the proper moisture content of groundnuts so that you can get the best yields from your harvest.*

Step 3: Closing Activities/Post-assessment (10 minutes)

**Question 1:** *How many of you can list the key signs of crop maturity for groundnuts?*

[Count the number of people that raise their hands and record on tablet]

*We will be ending today’s learning engagement. Before we do, what is one thing you learned today?* [Give chance for people to respond]

**Great! Thank you for sharing. Does anyone have any questions?** [Give time for people to ask questions. Make note of questions that you do not know the answers to and follow-up.] *Thank you again for participating today!*
Module 17. Triple S Method for Orange-fleshed Sweetpotato Seed Conservation (Part 1)

<table>
<thead>
<tr>
<th>Themes</th>
<th>Climate resilient Orange-fleshed Sweetpotato seed conservation for timely planting material. Introduction to the triple S method on how to prepare and store roots.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suggested Time</td>
<td>1 hour and 10 Minutes</td>
</tr>
<tr>
<td>Location</td>
<td>Central place suitable for using a projector</td>
</tr>
<tr>
<td>Materials Needed</td>
<td>SAWBO translated video of Triple S – Part I, projector, screen Laminated card, old container/basin, old newspaper, sand, sweetpotato roots, sticks, fork hoe, watering can/bucket</td>
</tr>
<tr>
<td>Facilitation Techniques</td>
<td>Discussion, demonstration</td>
</tr>
</tbody>
</table>

Specific Learning Objectives:
By the end of this learning engagement participants will be able to:

- Demonstrate their understanding of using Triple S technique for OFSP seed conservation
- List the benefits of using Triple S as a seed conservation technique
- List the procedures of proper root selection, preparation and storage using Triple S technique

Step 1: Warm-up Activity/Pre-assessment (15 minutes)
[Have the participants form a circle.] The facilitator should ask participants about their prior knowledge and experience with using triple S for seed conservation.

Welcome and thank you for joining today! Today we will be discussing the Triple S technique for OFSP seed conservation. I will ask you some questions and we will discuss the answers as a group.

Question 1: How many of you know about the Triple S technique?
[Count the number of people that raise their hands and record on tablet]

Question 2: What are other techniques you have used for sweetpotato seed conservation?
_Possible responses: multiplying and saving vines instead of roots…_

Step 2: Main Activity (45 minutes)
Today we will be discussing the Triple S technique for OFSP seed conservation.

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16 The video link was taken from Scientific Animations Without Borders (SAWBO) “Sweetpotato Roots Timely Planting Material: The Triple S Method on How to Prepare and Store Roots” video.
Does anyone know what Triple S stands for?

Possible responses: Triple S stands for Sand, Storage, and Sprouting which are steps used for storing sweetpotato roots to conserve planting materials during the dry season...

[Set-up of project and play the SAWBO video on “Sweetpotato Roots for Timely Planting Material: The Triple S Method on How to Prepare and Store Roots” linked below.]

**Video Link:**  [https://sawbo-animations.org/1312](https://sawbo-animations.org/1312)\(^\text{17}\) (select additional languages below)

- [https://sawbo-animations.org/2036](https://sawbo-animations.org/2036) (Gonja)
- [https://sawbo-animations.org/2037](https://sawbo-animations.org/2037) (Dagbani)
- [https://sawbo-animations.org/2038](https://sawbo-animations.org/2038) (Likpakpaa)
- [https://sawbo-animations.org/2039](https://sawbo-animations.org/2039) (Mampruli)
- [https://sawbo-animations.org/2040](https://sawbo-animations.org/2040) (Chekosi)

Does anyone have questions about the video? [give time for people to ask questions.]

Now we will practice using the Triple S technique for seed conservation.

[show laminated card with Triple S graphic and read the message on the back of the card.]

[***Insert laminated card when complete – under development by project team]

Front of card includes graphics, back of card includes text.

\(^\text{17}\) Ibid
[Follow steps shown in video and on laminated card for Triple S technique]

Ask the group – *What do you think of the Triple S technique? What are pros and cons of using this method instead of other methods such as saving vines instead of roots?*

*Possible responses:* You can conserve planting materials for longer during dry season with *Triple S*...

[Once the activity and discussion are complete read the summary below.]

Summary: The use of the Triple S technique for seed storage can help to preserve OFSP seeds during the dry months for longer than other storage techniques.

Step 3: Closing Activities/Post-assessment (10 minutes)

Question 1: *How many of you plan to use Triple S for conservation of sweetpotato roots for seed this year?*

[Count the number of people that raise their hands and record on tablet]

*We will be ending today’s learning engagement. Before we do, what is one thing you learned today?* [Give chance for people to respond]

Great! *Thank you for sharing. Does anyone have any questions?* [Give time for people to ask questions. Make note of questions that you do not know the answers to and follow-up.] Thank you again for participating today!
Module 18. Triple S Method for Preparing Orange-fleshed Sweetpotato Root Beds (Part 2)

<table>
<thead>
<tr>
<th>Themes</th>
<th>Sweetpotato roots for timely planting material – How to prepare and plant a root bed and crop using roots stored through Triple S method.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suggested Time</td>
<td>1 hour and 10 Minutes</td>
</tr>
<tr>
<td>Location</td>
<td>Central place suitable for using a projector</td>
</tr>
</tbody>
</table>
| Materials Needed | SAWBO translated video of Triple S – Part II\(^{18}\), projector, screen
Laminated card, old container/basin, old newspaper, sand, sweetpotato roots, sticks, fork hoe, watering can/bucket |
| Facilitation Techniques | Discussion, demonstration |

Specific Learning Objectives:
By the end of this learning engagement participants will be able to:

- Demonstrate their understanding of using Triple S technique for OFSP seed conservation
- List the benefits of using Triple S as a seed conservation technique

Step 1: Warm-up Activity/Pre-assessment (15 minutes)

[Have the participants form a circle.] The facilitator should ask participants about their prior knowledge and experience with using triple S for seed conservation.

\(^{11}\) Welcome and thank you for joining today! Today we will be discussing the Triple S technique for OFSP seed conservation. I will ask you some questions and we will discuss the answers as a group.

\(^{11}\) Question 1: **Have you used a root bed for your sweetpotatoes?**

[Count the number of people that raise their hands and record on tablet]

\(^{11}\) Question 2: **What are other techniques you have used for sweetpotato seed conservation?**

Possible responses: multiplying and saving vines instead of roots...

Step 2: Main Activity (45 minutes)

\(^{11}\) Today we will be discussing the Triple S technique for OFSP seed conservation.

\(^{11}\) Does anyone know what Triple S stands for?

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\(^{18}\) The video link and graphics used for the accompanying laminated card were adapted from Scientific Animations Without Borders (SAWBO) “Sweetpotato Roots for Timely Planting Material: How to Prepare and Plant a Root bed and Crop Using Roots Stored through Triple S Method” video.
Possible responses: Triple S stands for Sand, Storage, and Sprouting which are steps used for storing sweetpotato roots to conserve planting materials during the dry season...

[Set-up of project and play the SAWBO video on “Sweetpotato Roots for Timely Planting Material: How to Prepare and Plant a Root Bed and Crop Using Roots Stored through Triple S Method” linked below.]

**Video Link:** [https://sawbo/animations.org/1667](https://sawbo/animations.org/1667)

Does anyone have questions about the video? [give time for people to ask questions.]

Now we will practice using the Triple S technique for seed conservation.

[show laminated card with Triple S graphic and read the message on the back of the card.]

[***Insert laminated card when complete – under development by project team***]

Front of card includes graphics, back of card includes text.

[Follow steps shown in video for Triple S technique]

Ask the group – What do you think of the Triple S technique? What are pros and cons of using this method instead of other methods such as saving vines instead of roots?

Possible responses: You can conserve planting materials for longer during dry season with Triple S...

---

19 Ibid
[Once the activity and discussion are complete read the summary below.]

Summary: The use of the Triple S technique for seed storage can help to preserve OFSP seeds during the dry months for longer than other storage techniques.

Step 3: Closing Activities/Post-assessment (10 minutes)

Question 1: How many of you plan to use Triple S for conservation of sweetpotato roots for seed this year?

[Count the number of people that raise their hands and record on tablet]

We will be ending today’s learning engagement. Before we do, what is one thing you learned today? [Give chance for people to respond]

Great! Thank you for sharing. Does anyone have any questions? [Give time for people to ask questions. Make note of questions that you do not know the answers to and follow-up.] Thank you again for participating today!
Module 19. Managing Backyard Tree Crops (Watering and Pruning)

<table>
<thead>
<tr>
<th>Themes</th>
<th>Proper watering and pruning techniques for papaya and moringa trees.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suggested Time</td>
<td>60 Minutes</td>
</tr>
<tr>
<td>Location</td>
<td>Backyard garden belonging to a GFC member</td>
</tr>
<tr>
<td>Materials Needed</td>
<td>Laminated cards, pruning shears, watering bucket/can</td>
</tr>
<tr>
<td>Facilitation Techniques</td>
<td>Discussion, demonstration</td>
</tr>
</tbody>
</table>

Specific Learning Objectives:
By the end of this learning engagement participants will be able to:

- Demonstrate proper tree training (supporting, pruning, etc.), watering and soil management for papaya and moringa trees.

Step 1: Warm-up Activity/Pre-assessment (15 minutes)
[Have the participants form a circle.] The facilitator should ask participants about their prior knowledge and experience with proper management techniques for growing moringa and papaya trees.

Welcome and thank you for joining today! Today we will be discussing proper tree training and management techniques such as pruning and watering moringa and papaya trees. I will ask you some questions and we will discuss the answers as a group.

Question 1: How many of you have pruned moringa trees before?
[Count the number of people that raise their hands and record on tablet]

Question 2: Do you water your backyard crops during the dry season? (using such things as a bucket to apply from domestic wastewater, using plastic bottles, etc.)
[Count the number of people that raise their hands and record on tablet]

Step 2: Main Activity (35 minutes)
Today we will be discussing different techniques for managing moringa and papaya trees.

[show laminated card with moringa and papaya pruning and watering techniques]
During the rainy season, you do not want to overwater your plants. During the dry season you can redirect bath water directly to plants. See example below

Rainy season:  
Dry season:

Now we will practice these techniques together in your backyard garden.

[Follow steps on laminated cards for moringa and papaya pruning and watering techniques]  
[Demonstrate the practice at one backyard garden then have participants practice. Go to 2-3 backyards if possible.]

Ask the group – What is this person doing well? What can they improve on as they are pruning?
Summary: It is important to use proper techniques when managing your moringa and papaya to ensure the seedling survive in their new conditions.

Step 3: Closing Activities/Post-assessment (10 minutes)

Question 1: How many of you feel that you can properly prune your moringa trees?

[Count the number of people that raise their hands and record on tablet]

We will be ending today’s learning engagement. Before we do, what is one thing you learned today? [Give chance for people to respond]

Great! Thank you for sharing. Does anyone have any questions? [Give time for people to ask questions. Make note of questions that you do not know the answers to and follow-up.] Thank you again for participating today!

<table>
<thead>
<tr>
<th>Themes</th>
<th>Proper harvesting techniques of amaranth leaves and seeds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suggested Time</td>
<td>60 Minutes</td>
</tr>
<tr>
<td>Location</td>
<td>Backyard garden belonging to a GFC member</td>
</tr>
<tr>
<td>Materials Needed</td>
<td>Laminated cards</td>
</tr>
<tr>
<td>Facilitation Techniques</td>
<td>Discussion, demonstration</td>
</tr>
</tbody>
</table>

Specific Learning Objectives:
By the end of this learning engagement participants will be able to:

- Demonstrate understanding of the proper harvesting techniques of amaranth leaves for vegetables.
- Demonstrate proper harvesting of amaranth seeds and packaging techniques

Step 1: Warm-up Activity/Pre-assessment
[Have the participants form a circle.] The facilitator should ask participants about their prior knowledge and experience with harvesting amaranth.

Welcome and thank you for joining today! Today we will be discussing proper techniques for harvesting amaranth leaves and seeds. I will ask you some questions and we will discuss the answers as a group.

Question 1: How many of you have harvested amaranth leaves for vegetables before? What are some challenges?
[Count the number of people that raise their hands and record on tablet]

Question 2: How many of you have harvested and conserved amaranth seeds before?
[Count the number of people that raise their hands and record on tablet]

Step 2: Main Activity
Today we will be discussing proper techniques for harvesting amaranth.

[show laminated card with harvesting techniques for amaranth and read message on the back]
Now we will practice these techniques together in your backyard garden.

[Follow steps on laminated cards for proper harvesting techniques for amaranth]

Summary: Proper harvesting of amaranth leaves is important so that you do not damage the plant and can harvest subsequently. It is important to properly harvest, pack and store amaranth seeds so that you have seeds for the next season.

Step 3: Closing Activities/Post-assessment

Question 1: How many of you plan to conserve amaranth seeds?

[Count the number of people that raise their hands and record on tablet]

We will be ending today’s learning engagement. Before we do, what is one thing you learned today? [Give chance for people to respond]

Great! Thank you for sharing. Does anyone have any questions? [Give time for people to ask questions. Make note of questions that you do not know the answers to and follow-up.] Thank you again for participating today!
Module 21. Harvesting and Post-harvest Handling of Soybeans

<table>
<thead>
<tr>
<th>Themes</th>
<th>Proper harvesting and post-harvest handling techniques for soybeans.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suggested Time</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Location</td>
<td>Backyard garden belonging to a GFC member</td>
</tr>
<tr>
<td>Materials Needed</td>
<td>Laminated cards</td>
</tr>
<tr>
<td>Facilitation Techniques</td>
<td>Discussion</td>
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</tbody>
</table>

Specific Learning Objectives:
By the end of this learning engagement participants will be able to:

- Demonstrate the proper techniques and identify the appropriate timing for harvesting of soybeans.
- List the procedures for proper drying, threshing and storage techniques for soybeans.

Step 1: Warm-up Activity/Pre-assessment (15 minutes)
[Have the participants form a circle.] The facilitator should ask participants about their prior knowledge and experience with drying, threshing and storage for soybeans.

Welcome and thank you for joining today! Today we will be discussing proper harvesting and post-harvest handling techniques for soybeans. I will ask you some questions and we will discuss the answers as a group.

Question 1: **How many of you typically use threshing machines for harvesting soybeans?**

[Count the number of people that raise their hands and record on tablet]

Question 2: **What techniques do you typically use for drying, threshing and storage of soybeans?**

Possible responses: Solar drying to reduce soil moisture; use of manual or threshing machine to thresh, use of Jute sacks or plastic bags for storage.

Step 2: Main Activity (20 minutes)

Today we will be discussing different harvesting and post-harvest handling techniques for soybeans.

Ask: **What are the key signs of crop maturity for harvesting soybeans?**

Possible responses: Plant leaves begin to turn yellow & dry out; Pods turn brown and dry out; Some pods begin to split or shatter if harvesting is delayed
[show laminated card with harvesting and post-harvest handling techniques for soybeans and read the message on the back of card]

Now we will practice these techniques together on the demonstration site.

[Follow steps on laminated card for harvesting and post-harvest handling techniques for groundnuts]

Summary: It is important to understand the best time to harvest soybeans, the best available approaches to use so that you can get the best yields from your harvest.

Step 3: Closing Activities/Post-assessment (10 minutes)

Question 1: How many of you can list the key signs of crop maturity for soybeans?

[Count the number of people that raise their hands and record on tablet]

We will be ending today’s learning engagement. Before we do, what is one thing you learned today? [Give chance for people to respond]

Great! Thank you for sharing. Does anyone have any questions? [Give time for people to ask questions. Make note of questions that you do not know the answers to and follow-up.] Thank you again for participating today!
Module 22. Harvesting of Orange-fleshed Sweetpotatoes

<table>
<thead>
<tr>
<th>Themes</th>
<th>Proper techniques for harvesting OFSP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suggested Time</td>
<td>60 Minutes</td>
</tr>
<tr>
<td>Location</td>
<td>Backyard garden belonging to a GFC member</td>
</tr>
<tr>
<td>Materials Needed</td>
<td>Laminated cards</td>
</tr>
<tr>
<td>Facilitation Techniques</td>
<td>Discussion, demonstration</td>
</tr>
</tbody>
</table>

Specific Learning Objectives:
By the end of this learning engagement participants will be able to:

- Demonstrate proper techniques for harvesting OFSP

Step 1: Warm-up Activity/Pre-assessment (15 minutes)
[Have the participants form a circle.] The facilitator should ask participants about their prior knowledge and experience with harvesting OFSP.

Welcome and thank you for joining today! Today we will be discussing proper techniques for harvesting OFSP. I will ask you some questions and we will discuss the answers as a group.

Question 1: Who has harvested OFSP before?
[Count the number of people that raise their hands and record on tablet]

Question 2: What are important things to consider when harvesting OFSP?
Possible responses: storage condition, season, proper pest (weevils) control...

Step 2: Main Activity (35 minutes)

Today we will be discussing harvesting of OFSP.

[show laminated card with proper OFSP harvesting techniques]
Now we will practice these techniques together in your small OFSP plot.

[Follow steps on laminated cards for harvesting of OFSP]

Summary: It is important to use proper techniques when harvesting OFSP to ensure that they are stored correctly.

Step 3: Closing Activities/Post-assessment (10 minutes)

Question 1: How many of you now understand the steps for harvesting OFSP?

[Count the number of people that raise their hands and record on tablet]

We will be ending today’s learning engagement. Before we do, what is one thing you learned today? [Give chance for people to respond]

Great! Thank you for sharing. Does anyone have any questions? [Give time for people to ask questions. Make note of questions that you do not know the answers to and follow-up.] Thank you again for participating today!
Module 23. Use of Double S Technique for Orange-fleshed Sweetpotato Storage

<table>
<thead>
<tr>
<th>Themes</th>
<th>Use of Double S technique for OFSP storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suggested Time</td>
<td>1 hour and 10 Minutes</td>
</tr>
<tr>
<td>Location</td>
<td>Backyard garden belonging to a GFC member</td>
</tr>
<tr>
<td>Materials Needed</td>
<td>SAWBO translated video of Double S&lt;sup&gt;20&lt;/sup&gt;, projector, screen Laminated cards for Double S, quality sand, bucket, materials to construct pits and hut.</td>
</tr>
<tr>
<td>Facilitation Techniques</td>
<td>Discussion, demonstration</td>
</tr>
</tbody>
</table>

Specific Learning Objectives:
By the end of this learning engagement participants will be able to:

- Demonstrate the key procedures and proper implementation of Double S technique for proper storage of fresh OFSP roots.
- List the key inputs required for Double S technology.

Step 1: Warm-up Activity/Pre-assessment (15 minutes)
Have the participants form a circle.] The facilitator should ask participants about their prior knowledge and experience with using the Double S technique for OFSP.

Welcome and thank you for joining today! Today we will be the Double S technique for sweetpotato roots storage. I will ask you some questions and we will discuss the answers as a group.

Question 1: Has anyone used the Double S technique for sweetpotato storage before?
[Count the number of people that raise their hands and record on tablet]

Question 2: What are the most important inputs needed for Double S technology?
Possible responses: Availability of quality sand, space to make step pits, availability of materials (wooden materials and grass thatches) for roofing

Step 2: Main Activity (45 minutes)
Today we will be discussing the double S technique for harvesting and storing OFSP roots.

---

<sup>20</sup> The video link was taken from Scientific Animations Without Borders (SAWBO) “Double S: Harvesting and Storing Your Sweetpotato Crop” video.
[Set-up of project and play the SAWBO video on “Double S: Harvesting and Storing your Sweetpotato Crop” linked below.]

**Video Link:** [https://sawbo-animations.org/1647](https://sawbo-animations.org/1647)

Does anyone have questions about the video? [give time for people to ask questions.]

Now we will practice using the Double S technique for OFSP roots storage together.

[Follow steps on laminated cards for Double S storage technique for OFSP]

[show laminated card with Double S technique for OFSP storage and read the message on the back of the card.]

***Insert laminated card when complete – under development by project team***

*Front of card includes graphics, back of card includes text.*

Ask the group - **What is the most important step to remember?**

Ask the group – **What do you think of the Double S technique? What are pros and cons of using this method for harvesting and storing OFSP roots?**

---

21 Ibid.
Summary: Storing your harvested OFSP roots using the Double S technique will help prevent the spread of diseases and pests and allow you to store sweetpotato roots for many months. Having quality sand, a space for pits, and materials for roofing is key.

Step 3: Closing Activities/Post-assessment (10 minutes)

Question 1: How many of you are willing to apply Double S technology in the coming season?

[Count the number of people that raise their hands and record on tablet]

We will be ending today’s learning engagement. Before we do, what is one thing you learned today? [Give chance for people to respond]

Great! Thank you for sharing. Does anyone have any questions? [Give time for people to ask questions. Make note of questions that you do not know the answers to and follow-up.] Thank you again for participating today!
### Module 24. Harvesting of Moringa Leaves and Seeds

<table>
<thead>
<tr>
<th>Themes</th>
<th>Proper harvesting techniques of moringa leaves</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suggested Time</td>
<td>60 Minutes</td>
</tr>
<tr>
<td>Location</td>
<td>Backyard garden belonging to a GFC member</td>
</tr>
<tr>
<td>Materials Needed</td>
<td>Laminated cards, sharp cutlass/machete</td>
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<tr>
<td>Facilitation Techniques</td>
<td>Discussion, demonstration</td>
</tr>
</tbody>
</table>

#### Specific Learning Objectives:
By the end of this learning engagement participants will be able to:

- Demonstrate their understanding of the proper harvesting techniques for harvesting moringa leaves.
- Demonstrate proper harvesting of moringa seeds

#### Step 1: Warm-up Activity/Pre-assessment (15 minutes)
[Have the participants form a circle.] The facilitator should ask participants about their prior knowledge and experience with harvesting moringa leaves.

Welcome and thank you for joining today! Today we will be discussing proper techniques for harvesting moringa leaves and seeds. I will ask you some questions and we will discuss the answers as a group.

Question 1: Has anyone harvested moringa leaves before?
[Count the number of people that raise their hands and record on tablet]

Question 2: How do you typically harvest and store moringa leaves after harvesting?
Possible responses: ...

#### Step 2: Main Activity (35 minutes)
Today we will be discussing techniques for harvesting moringa leaves.

[show laminated card with techniques for harvesting moringa leaves and read the message on the back of the card]
Now we will practice these techniques together in your backyard garden.

[Follow steps on laminated cards for harvesting of moringa leaves.]

Summary: Moringa leaves can be harvested 6-12 months after planting. Proper harvesting techniques such as snapping leaf stems from branches and harvesting young shoots will promote plant development allowing for multiple harvests of leaves.

Step 3: Closing Activities/Post-assessment (10 minutes)

Question 1: How many of you can demonstrate proper techniques for harvesting moringa leaves?

[Count the number of people that raise their hands and record on tablet]

We will be ending today’s learning engagement. Before we do, what is one thing you learned today? [Give chance for people to respond]

Great! Thank you for sharing. Does anyone have any questions? [Give time for people to ask questions. Make note of questions that you do not know the answers to and follow-up.] Thank you again for participating today!
Module 25. Harvesting and Post-harvest Handling of Papaya

<table>
<thead>
<tr>
<th>Themes</th>
<th>Proper harvesting and post-harvest handling for papaya</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suggested Time</td>
<td>60 Minutes</td>
</tr>
<tr>
<td>Location</td>
<td>Backyard garden belonging to a GFC member</td>
</tr>
<tr>
<td>Materials Needed</td>
<td>Laminated cards, sharp cutlass/machete</td>
</tr>
<tr>
<td>Facilitation Techniques</td>
<td>Discussion, demonstration</td>
</tr>
</tbody>
</table>

Specific Learning Objectives:
By the end of this learning engagement participants will be able to:

- Identify the signs of maturity of papaya fruits
- Demonstrate proper postharvest handling techniques

Step 1: Warm-up Activity/Pre-assessment (15 minutes)
[Have the participants form a circle.] The facilitator should ask participants about their prior knowledge and experience with harvesting papaya.

Welcome and thank you for joining today! Today we will be discussing proper techniques for harvest and post-harvest handling of papaya. I will ask you some questions and we will discuss the answers as a group.

Question 1: Who has harvested papaya before?
[Count the number of people that raise their hands and record on tablet]

Question 2: How do you typically harvest and store papaya?
Possible responses: cutting the stalks close to point of attachment of stem, if the plant is too tall I climb to collect the fruit, I store it in a shady area after harvesting...

Step 2: Main Activity (35 minutes)
Today we will be discussing proper harvesting and post-harvest handling of papaya.

Ask: How do you know when to harvest?
Possible responses: when the peel startes to change colors, 4-5 months ...
Now we will practice these techniques together in your backyard garden.

[Follow steps on laminated cards for harvesting papaya and discuss proper post-harvest handling techniques]

Summary: Papaya should be harvested 4-5 weeks after they start to flower to make sure they can ripen completely. The color should be light green with some yellow developing at the base of the fruit upwards. Papaya should be harvested in the early morning or late evening because it is cooler and should be stored in a shaded area laid flat next to each other not stacked on top of one another.

Step 3: Closing Activities/Post-assessment (10 minutes)

Question 1: How many of you now understand what to look for when harvesting papaya?

[Count the number of people that raise their hands and record on tablet]

We will be ending today’s learning engagement. Before we do, what is one thing you learned today? [Give chance for people to respond]

Great! Thank you for sharing. Does anyone have any questions? [Give time for people to ask questions. Make note of questions that you do not know the answers to and follow-up.] Thank you again for participating today!

***Note***

The technical briefs for each nutritious crop were created by SARI and are being reviewed by the GROWING technical team. Once complete, they may be added here to be used as a resource.

***********

1. Orange-flesh Sweetpotato
   - 1.1. Climate resilient production and postharvest management of Orange-flesh sweetpotato
   - 1.2. Introduction about benefits and major production challenges of OFSP
   - 1.3. Climate resilient, high-yielding and nutritious OFSP varieties and clean seeds
   - 1.4. Land preparation (ridging, spacing) and proper planting techniques
   - 1.5. Integrated pest management, weeding and hoeing
   - 1.6. Proper harvesting techniques (piecemeal) and climate-resilient postharvest handling techniques
   - 1.7. Use of Triple S, vine multiplication from spouted roots and establishing root bed gardens
   - 1.8. Use of Double S for long-term storage of fresh roots for consumption and marketing

2. Moringa
   - 2.1. Climate resilient backyard production and postharvest management of Moringa
   - 2.2. Introduction about socio-economic and health benefits of Moringa
   - 2.3. Nursery management and production of vigorous seedlings
   - 2.4. Land preparation and transplanting Moringa as a backyard crop
   - 2.5. Pruning at nursery and sapling stages for bushy growths
   - 2.6. Climate-resilient backyard farming (organic amendments, zai pits, fencing, supplementary/deficit irrigation, and pest/disease prevention/control)
   - 2.7. Proper harvesting of Moringa leaves and seeds
   - 2.8. Postharvest handling and utilization techniques

3. Papaya (pawpaw)
   - 3.1. Climate resilient and sustainable backyard production and postharvest management of papaya
   - 3.2. Introduction about benefits and major production challenges of Papaya
   - 3.3. Climate resilient, high-yielding and nutritious varieties and breaking seed dormancy
   - 3.4. Nursery management, land preparation and transplanting
   - 3.5. Land preparation and transplanting Papaya as a backyard crop
   - 3.6. Climate-resilient backyard farming (organic amendments, fencing, supplementary/deficit irrigation, zai pits, and pest/disease prevention/control)
   - 3.7. Proper harvesting and postharvest handling of papaya
4. Amaranth  
4.1. Climate resilient and sustainable backyard production and postharvest management of Amaranth  
4.2. Introduction about benefits and major production challenges for Amaranth  
4.3. Nursery management for production of vigorous Amaranth seedlings  
4.4. Land preparation, use of organic fertilizer and proper planting techniques  
4.5. Integrated pest management (prevention, biopesticides, cultural, etc.)  
4.6. Proper harvesting (piecemeal and total) and postharvest handling  

5. Groundnuts  
5.1. Climate resilient and sustainable backyard production and postharvest management of Ground nuts  
5.2. Introduction about benefits and major production challenges for Ground nuts  
5.3. Same-season rotation of ground nuts with cereals and OFSP  
5.4. Climate resilient and high-yielding varieties and, use of certified seeds  
5.5. Inoculation and use of organic fertilizer for ground nuts  
5.6. Site selection and proper land preparation techniques  
5.7. Weed control, integrated pest management and, proper use of Aflasafe  
5.8. Proper harvesting, drying, shelling and climate resilient storage technologies  

6. Soybeans  
6.1. Climate resilient and sustainable backyard production and postharvest management of Soybeans  
6.2. Introduction about benefits and major production challenges of soybeans  
6.3. Climate resilient, high-yielding and nutritious varieties and use of certified seeds  
6.4. Intercropping of soybean with cereals  
6.5. Site selection, proper land preparation, planting, and appropriate use of fertilizers (organic/ inorganic)  
6.6. Weed control, integrated pest management  
6.7. Proper harvesting, threshing and climate resilient storage technologies
ANNEX B: LEARNING ENGAGEMENTS AND IMPLEMENTATION TIMELINE:

<table>
<thead>
<tr>
<th>LEARNING ENGAGEMENT MODULES FOR GFCs</th>
<th>JAN</th>
<th>FEB</th>
<th>MAR</th>
<th>APR</th>
<th>MAY</th>
<th>JUN</th>
<th>JUL</th>
<th>AUG</th>
<th>SEP</th>
<th>OCT</th>
<th>NOV</th>
<th>DEC</th>
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<tbody>
<tr>
<td>1 Benefits and Challenges for Cultivating Orange-fleshed Sweetpotato</td>
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<tr>
<td>2 Benefits and Challenges for Backyard Farming (Moring, Papaya &amp; Amaranth)</td>
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<td>3 Benefits and Challenges for Groundnut Cultivation</td>
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<td>4 Benefits and Challenges for Soybean Cultivation</td>
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<td>5 Composting for Organic Fertilizer</td>
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<td>6 Same Season Rotation of Groundnuts with Orange-fleshed Sweetpotato</td>
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<td>7 Intercropping of Soybeans with Maize</td>
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<td>8 Environmentally Aware Land Preparation for Legume Crops</td>
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<td>9 Land Preparation and Fencing for Backyard Tree Crops (Papaya &amp; Moringa)</td>
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<tr>
<td>10 Land Preparation and Transplanting of Orange-fleshed Sweetpotato</td>
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<td>11 Planting of Groundnuts with Inoculants</td>
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<td>12 Amaranth Seedling Production in Raised Soil Beds</td>
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<td>13 Planting of Soybeans with Inoculants</td>
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<td>14 Transplanting of Tree Seedlings (Moringa and Papaya)</td>
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<tr>
<td>15 Use of Neem for Pest Prevention and Control</td>
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<tr>
<td>16 Harvesting and Post-harvest Handling of Groundnuts</td>
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<tr>
<td>17 Triple S Method for Orange-fleshed Sweetpotato Seed Conservation (Part 1)</td>
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<tr>
<td>18 Triple S Method for Preparing Orange-fleshed Sweetpotato Root Beds (Part2)</td>
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<td>19 Managing Backyard Tree Crops (Watering and Pruning)</td>
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<tr>
<td>20 Harvesting of Amaranth for Vegetables and Seeds</td>
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<tr>
<td>21 Harvesting and Post-harvest Handling of Soybeans</td>
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<tr>
<td>22 Harvesting of Orange-fleshed Sweetpotatoes</td>
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<tr>
<td>23 Use of Double S Technique for Orange-fleshed Sweetpotato Storage</td>
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<tr>
<td>24 Harvesting of Moringa Leaves and Seeds</td>
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<td>25 Harvesting and Post-harvest Handling of Papaya</td>
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* The timeline was created to align with the agricultural season of each nutritious crop and serves as a guide for implementing the learning engagements.
ANNEX C: PRE- AND POST- TRAINING ASSESSMENT TOOLS

Action Research Approach:
The GROWING Project takes an action research approach to project design and implementation. To better understand the outcomes of each learning engagement, a series of pre-assessment and post-assessment questions will be verbally given to the participants by the facilitators. The pre-assessment questions have been integrated into the warm-up activity as discussion questions and the post-assessment questions are integrated into the closing activities. The assessments will not measure individuals understanding of each learning engagement but rather the group’s overall familiarity and understanding of each learning engagement theme and what participants learned after participating in the learning engagement activities. The full list of pre-and post- assessment questions for each learning engagement are included below.

***NOTE***
Responses to questions highlighted in yellow (in each learning engagement) will be collected by the CBEA and reported though the project’s digital monitoring system. The questions will need to be reviewed by the M&E team prior to finalizing the manual. Once the questions are confirmed they can be added to this section of the manual following the format utilized in the project’s data collection system.

************
B. DRAFT GRAPHICS

Draft graphics from ANNEX D of the manual are included as examples. The graphics included are not yet finalized and are currently under development by the project team.
ANNEX D: GRAPHICS

***NOTE***
The graphics included on the laminated cards for each learning engagement are currently under development by a graphic designer hired by the project. Draft graphics are included below as examples.

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Example - Laminated card with graphics (on front) and facilitator notes (on back)

MODULE 5 - PROCEDURES FOR THE PREPARATION OF COMPOST

3

4

5

6
Module 5: Composting for Organic Fertilizer

Step 1: Welcome and thank you for joining today! We will be discussing how you can make your own compost and use it as organic fertilizer.

Question 1: How many of you have made your own compost? [Count the number of people that raise their hands and record on tablet]
Question 2: What are the benefits of making your own compost and using it? [improves soil structure and increases nutrients, low-cost]

Step 2: Now I will share with you some important steps for composting.
[Set-up of project and play the SAWBO video on “Survival Gardening: How to Create Compost” - https://sawbo-animations.org/228]

[Follow steps in the video and on the card to make compost as a group.] Now we will be following these steps to make our own compost together.
1. Prepare the necessary ingredients for the compost preparation such as crop residues (green and dry materials), Soil or termite mounds, Animal droppings (poultry, goats or cattle manure) including kitchen left over dried organic matter, etc.
2. Prepare a surface layer with sticks or maize stalks and prepare a rectangular or square trench to drain the excess water down.
3. Put them in layers adding water before the next layer.
4. Add water once every week for the first two months.
5. After three months, you need to turn the layers up-side down to mix the materials.
6. Wait for more weeks or months to complete the decomposition and get the compost ready to use.

Summary: Using compost is a simple, low-cost way to improve nutrients in the soil.

Step 3: Question 1: How many of you are now interested in making your own compost at home? [Count the number of people that raise their hands and record on tablet]

We will be ending today’s learning engagement. Before we do, what is one thing you learned today? [Give a chance for people to respond]
Great! Thank you for sharing. Does anyone have any questions? [Give time for people to ask questions.] Thank you for participating today!
1. Yellow-fleshed Sweetpotato
2. Purple-fleshed Sweetpotato
3. Orange-fleshed Sweetpotato (It is a rich source of Vitamin A)
4. White-fleshed Sweetpotato
MODULE 1B – SWEETPOTATOES PRODUCTION AND POSTHARVEST CHALLENGES
1. Lack of planting material (vines) at the beginning of the rainy season
2. Weevil infestation
3. Sweetpotato virus disease
4. Lack of proper storage and transportation of sweetpotato roots
5. Lack of knowledge and technology for processing and incorporation of sweetpotato into local recipes
MODULE 2 – CHALLENGES FOR BACKYARD FARMING

1. 

2. 

3. 

1. Lack of access to seedlings or seeds of improved varieties of the backyard crops (e.g. papaya seedlings and Amaranth seeds),

2. Lack of knowledge and skills on proper management of backyard trees and vegetable crops (lack of fencing, improper water applications during the rainfall and dry seasons)

3. Pest damages on Amaranth vegetables (e.g. bugs and Aphids cause serious damage on amaranth)
MODULE 3 - GROUNDNUT PRODUCTION AND POSTHARVEST CHALLENGES
1. Lack of access to seeds of the improved varieties (early maturing and disease resistant)
2. Lack of access to biofertilizer (inoculants)
3. Aflatoxin infection
4. Lack of proper drying of the ground nuts causing postharvest losses
5. Lack of improved postharvest management and marketing techniques
1. Lack of access to seeds of the improved varieties (early maturing and non-shattering)
2. Lack of access to biofertilizer (inoculants)
3. Early cessation of rainfall causing drought and hence, low yield
4. Lack of access to proper threshing technologies causing postharvest losses.
5. Lack of improved postharvest management and marketing techniques.
MODULE 5 - PROCEDURES FOR THE PREPARATION OF COMPOST
1. Prepare the necessary ingredients for the compost preparation such as crop residues (green and dry materials), Soil or termite mounds, Animal droppings (poultry, goats or cattle manure) including kitchen left over dried organic matter, etc.

2. Prepare a surface layer with sticks or maize stalks and prepare a rectangular or square trench to drain the excess water down.

3. Put them in layers adding water before the next layer.

4. Add water once every week for the first two months.

5. After three months, you need to turn the layers up-side down to mix the materials.

6. Wait for more weeks or months to complete the decomposition and get the compost ready to use.
MODULE 6 - SAME SEASON ROTATION OF GROUNDNUT WITH ORANGE FLESHED SWEETPOTATO
1. Plant early maturing groundnut variety using the early rainfall in March/April/early May.

2. Harvest the groundnut in July/early August and plant OFSP immediately. Harvest the OFSP in November/December.
MODULE 7 - INTERCROPPING OF SOYBEAN WITH MAIZE
1. Intercropping soybean with maize helps to have two crops together on the same plot at the same time. The soyabean will help improve the soil fertility for maize production. It can also help to reduce pest and disease dissemination.

2. The best strategy of intercropping is to have two rows of maize followed by two rows of soybean. But it can be modified based on the preference of the farmers.

3. When selecting the varieties of the soybean and maize, the difference in maturity period should not vary more than 20 days.

4. Planting of the soybean and maize can be undertaken at the same time. You can use compost or inoculant for soybean as fertilizer and chemical or organic fertilizer for maize.
1. Avoid crop residue burning as it causes loss of soil fertility and biodiversity.

2. Avoid deforestation as it causes environmental degradation.

3. Select sites with sandy loams soils. Loam soil holds together after squeezing but falls apart when it is poked.

4. Do not select soils with heavy clay characteristics. Clay soil is slippery and oozes between the fingers and holds its shape when it is released.
MODULE 9 - BACKYARD LAND PREPARATION AND TRANSPLANTING OF TREE SEEDLINGS
1. Prepare your backyard for growing of nutritious crops such as papaya and Moringa trees. The domestic wastewater can also be guided to the backyard. Fencing of the backyards is critical to prevent damage to the crops by animals.

2. Preparation zaipits with a spacing of 2 meters between trees and add manure and crop residues.

3. Plant the seedlings (papaya or Moringa) properly without bending the roots. Apply water by channel or bucket after planting.

4. Continue applying water when there is not rainfall.
MODULE 10 – LAND PREPARATION AND PROPER PLANTING TECHNIQUES FOR ORANGE-FLESHED SWEETPOTATO

1. 60cm-1 metre
2. 30cm high
3. 30cm
4. 30cm
1. Select an appropriate land that is not prone to flooding. Sweetpotato should be planted in ridges with a minim of 30 cm height. The spacing between consecutive ridges can be 80 cm-100 cm in Northern Ghana (about 1 pace of an adult man).

2. Collect vines from a healthy sweetpotato field that is at least 2-3 months old.

3. When harvesting the vines, each vine cutting needs to have 5 nodes for root production.

4. The vine cuttings should be planted with the nodes facing upwards. It is recommended that 2 of the vine nodes are buried under the soil and the other three are above the soil.

5. After two weeks of planting, inspect the survival of the vine cuttings. Refilling should be done to replace the dead ones.
MODULE 11 – PROCEDURES FOR PROPER INOCULATION OF GROUNDNUT
1. Obtain a good quality inoculant from a reliable source (e.g. SARI or private vendor)
MODULE 13 – SOYBEAN INOCULATION PROCEDURE

1. 

2. 

3. 

4. 

5. 

6.
C. YEAR 1 PROJECT SUMMARY

The GROWING Futures: The first cycle of the gender-transformative integrated climate smart agriculture-nutrition-marketing intervention gets off the ground in Northern Ghana project document is included as reference. This document was written by CIP and the GROWING project team.
GROWING Nutritious Foods, GROWING Futures: The first cycle of the gender-transformative integrated climate smart agriculture-nutrition-marketing intervention gets off the ground in Northern Ghana

With the completion of the Project Implementation Plan in October 2022, work setting up the first two-year cycle of GROWING Future Clubs (GFCs) among households with young children in 36 communities began in earnest, focusing first on ensuring agricultural interventions occurred in a timely manner, then nutrition trainings, and getting gender champions in place to initiate gender dialogues at district and local levels. Much is being learned that will inform and improve the integrated intervention by the start of Cycle 2 in December 2023.

Progress Update: November 2022-August 2023

Where are we starting from?

Our baseline survey¹, conducted in 1,800 households across the six project districts in three regions (Northern, Savannah, and North East) in Ghana, confirmed that GROWING operates in communities suffering from a high degree of poverty, food insecurity, poor diet quality, and gender inequity. We prioritized working with households with young children. Households are overwhelmingly male headed (98%), with an average household size of 7.5 members. Approximately every fifth household member (21.5%) lives in a polygamous marriage. Levels of formal education are extremely low, with 89% of the reference women and 77% of household heads attaining only basic education or having no formal education at all. Just 8.7% of households have at least one member with a salaried job. Only 15% are accessing a Village Savings and Loan Association (VSLA) or Self-Help Group and a mere 2.4% have microfinance loans.

These agriculturally dependent households must cope with a short, unimodal growing season, cultivating on average 3.7 hectares. Only 8.6% engaged in dry season irrigated production the previous year. Less than a third (31.7%) are food secure. Dietary diversity is low, with young children only consuming an average of 3.5 of 9 food groups in the 24 hours prior to the interview. Only 14.4% of young children achieved an adequate frequency of intake of vitamin A-rich foods during the week prior to the survey. During the last growing season, only 15% of these households grew any type of sweetpotato, 3.6% grew moringa, 2.3% had papaya, and 1.7% cultivated amaranth. Thus, these four nutritious food crops being promoted by GROWING will truly contribute to diet diversification and improved incomes, with orange-fleshed sweetpotato (OFSP) and papaya being excellent sources of provitamin A in the diet. Given that 56% of households cultivate groundnuts and 62% soybean, promotion of

¹ Data were collected between November 2022 until February 2023; these same households will be visited at endline. Within the six districts, there are 165 Community-based Health Planning and Services (CHPS) zones: 47 were classified as CHPS zones with high irrigation potential and 118 as having low irrigation potential. In each of these two categories, 36 CHPS zones were randomly selected, 18 of which were randomly assigned into a treatment group and 18 into a control group. For each high/low irrigation potential and treatment/control group combination, 180 communities were randomly selected. Within each community, 10 households having mothers with a young child or a pregnant woman were randomly selected from a list of eligible households.
OFSP sweetpotato-legume dishes and rotation schemes can be prioritized. There is a high awareness of the effects of climate change, but knowledge of and adoption of climate-smart agriculture practices is low, with only 8% accessing extension services during the last 12 months.

The main objective of the project is to reduce gender inequity within the home. Using the project Women’s Empowerment Index in Agriculture (pro-WEIA) as a key indicator, baseline results indicate that only 13% of women have achieved empowerment, compared to 42% of men. Only 30% of couples have achieved gender parity. The overall pro-WEIA score (ranging from 0 to a high of 1) is 0.55. It should be noted that both women and men achieve a significantly higher level of empowerment in most measures in CHPS zones with higher irrigation potential compared to those in areas with a low irrigation potential. Considerable variation exists between districts concerning the degree of gender inequity. Of particular concern is the Gushegu district, where the pro-WEIA score is only 0.36. Gushegu and East Mamprusi also have the lowest scores on several nutrition indicators.

Clearly, there are no magic bullets to improve nutrition and financial security in such a setting. An integrated approach that addresses agroclimatic, sociocultural, and economic constraints is required.

### What do we want to achieve?

The Generating Revenues and Opportunities for Women to Improve Nutrition in Ghana (GROWING) project is an action research project that uses an integrated intervention strategy (Figure 2) and nine innovations to: 1) achieve more equitable and enhanced nutrition, 2) increase control of income by women and youth, and 3) improve support for a more inclusive, gender-equitable, nutritious, climate-smart and resilient food system. By improving the enabling environment, increasing the agency of women, and transforming unequal gender relations, we seek to achieve the ultimate goal of improved nutritional and financial security of women, youth, and young children in 6 districts of former Northern Region.

Young children under five years of age, lactating women, and pregnant women are at greatest risk of micronutrient deficiencies. Hence, the direct beneficiaries are 7,560 women of reproductive age (15-49 years) with their children under five years of age and 5,292 men (mostly spouses). There will be three two-year cycles of the integrated intervention: Cycle 1 (2023-2024) reaching 1,080 households; Cycle 2 (2024-2025) reaching 2,160 households, and Cycle 3 (2024-2026) reaching 4,320 households. In each selected community, an average of 30 households will constitute a GROWING Futures Club (GFC), with both the woman and man in the household expected to participate in all components.

In addition, for the marketing component, 12 Healthy Food Connectors—traders selected with community participation—will be trained and supported with financial services for 3 years. Twenty-four urban women will be recruited as Nutritious Food Corps Agents to sell nutritious foods in 12 urban markets and demonstrate their safe preparation.

![Figure 2. Components of the Integrated GROWING approach](image)

There will be substantially strengthening of Ghana Health Service (GHS) personnel and Community-Based Extension Agents (CBEAs) for the agricultural and market components. To create a more enabling environment to transform gender relations and enhance women’s access to inputs and services, gender dialogues and trainings will be conducted with religious, local, and government leaders. In addition, we estimate over 15,000 indirect rural household and 40,000 indirect urban consumer beneficiaries.

Any positive evidence generated will be used by advocates encouraging the uptake of the part or all of GROWING integrated approach by government programs and other project investments. The main expected outcomes are positive improvements in the Women’s Empowerment in Agriculture Index, gender parity, the diversity of the diet consumed by women and young children, and revenue generated due to the adoption and marketing of climate-resilient nutritious foods and better practices.

### How far have we progressed to date?

After conducting formative research during the first six months, the team prepared its Project Implementation Plan which was reviewed by a Technical Working Group and the Steering Committee (October 2022), with the revised document approved by the donor, Global Affairs Canada.

Since October 2022, the focus has been on moving from theory to practice. The first step was to form the 37 GROWING Futures Clubs (GFC) in Cycle 1, explaining first to community leaders then to communities themselves the intent of the intervention and why the focus was on recruiting households with young children—preferably those under two years of age and pregnant women for each GFC. With our strong commitment to learning, a digital registration system was established, not only

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2 Six districts selected for GROWING intervention from the former northern region now come from three separate regions: Saboba and Gushegu districts in the Northern Region; North Gonja and West Gonja districts in the Savannah Region; Chereponi and East Mamprusi districts in the North East Region.
capturing essential demographic information on the reference woman and man from each household but providing each with a badge containing a QR code to facilitate monitoring actual participation in project training and events (Figure 3).

**Figure 3.** Scanning the QR code on the ID badge of a GFC member in Nasome (Saboba District) on day received amaranth seeds. Credit CIP

In all components, a training of trainers (ToT) approach is being used, where GROWING staff train district-level government personnel and local implementing partners, who in turn train the implementing agents based in the community in step-down trainings. The GROWING staff continue to support and supervise how the community agents implement the trainings.

**Agriculture: the CORE circle.** Throughout 2022, field trials were conducted to select the varieties to promote. Each GFC selected someone from within their Club, after listening to criteria for selection provided by GROWING, to be their Community-Based Extension Agent (CBEA). Half are women. Each CBEA is trained on all agricultural components, focusing on climate-smart production and post-harvest techniques by District Government Extension Personnel and implementing partners, both of whom have been trained by GROWING extension staff, including use of digital tools that contain additional reference materials and ODK programs for monitoring participation.

As learning by doing is key to the acceptance of technology, a demonstration plot was established within each GFC community. This is the site of practical trainings for GFC members by the CBEAs. The project promotes climate-smart practices, including the use of improved groundnut (SARINUT2) and soybean (Jenguma) varieties, the use of inoculant as a biofertilizer and compost instead of chemical fertilizer for legumes, the same season rotation of groundnuts followed by OFSP in two districts (North Gonja and West Gonja), and soybean-maize intercropping in the remaining districts. Moreover, the project promotes the Storage in Sand, then Sprouting (Triple S) technology which is a root-based approach for generating sweetpotato vine cuttings as planting material for the following season.

**Nutrition: joint goal selection for change.** The manual with nine nutrition modules was printed for the implementation of Cycle 1, along with the field tools: laminated cards with the 4 Star Diet for the North; the goal card for decision making, and the counseling card for feeding practices. During this period, two ToT sessions were held for district and regional Nutrition Officers, the first for modules 1-3;

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1 In collaboration with AIDData at the College of William and Mary, social diffusion of the Triple S technology will be studied in depth in the Cycle 1 households. The objective is to determine whether differences in how the Triple S technology is introduced, and by whom it is promoted make a difference to uptake. Hence, there were instructions for each community regarding the gender (male/female) and social status (leader, peer) of the CBEA to be selected.

2 3 DVMs received PumpTech climate smart solar-powered irrigation pumps with a subsidy from the German Agency for International Cooperation (GIZ) to enable multiplication during the dry season. These pumps have very low running costs as they do not require fuel and lubricants.

3 Challenges were incurred with papaya during the seedling multiplication and hence, the dissemination of papaya was delayed in five GFCs at West Gonja and 1 in Chereponi. The main challenge was that both papaya and moringa seedling transport time was long from the nursery and hence, some did not survive upon arrival.

Crops Research Institute supplied the pre-basic, disease-free cuttings of the OFSP varieties (JanLow and Suyolo). Then three basic seed multipliers were supported with miniscreen houses and training to establish a stock of clean basic OFSP seed and further multiply it (Figure 4).

**Figure 4.** Planting disease free pre-basic seed in screenhouse of basic seed producer in January 2023. Credit Abdul-Lateef Yakubu

In addition, five district-level vine multipliers (DVMs) had to be properly identified, trained, and supplied with quality starter material. The distribution of cuttings to households of GFC members began in June, and by mid-August 1,131 households had received 300 cuttings each (Figure 5). The Agriculture for Nutrition and Poverty Alleviation (ANPA) nursery was contracted to multiply moringa and papaya seedlings, with each GFC household receiving 3 seedlings of moringa, 2 seedlings of papaya (variety Solo), and 5 grams of amaranth. Backyard cropping of tree crops (moringa and papaya) and amaranth leaves has been demonstrated.

**Figure 5.** GFC members receiving their OFSP planting materials. Credit Abdul-Lateef Yakubu

**Nutrition: joint goal selection for change.** The manual with nine nutrition modules was printed for the implementation of Cycle 1, along with the field tools: laminated cards with the 4 Star Diet for the North; the goal card for decision making, and the counseling card for feeding practices. During this period, two ToT sessions were held for district and regional Nutrition Officers, the first for modules 1-3;
the second for modules 4-6. Then, step-down trainings were conducted for Community Health Officers (CHO), who subsequently implemented modules 1-3. The first topic was focused on introducing the concept of GFC and why the selected agricultural crops were chosen to improve the diet. The second topic on maternal nutrition for exclusive breastfeeding tested the use of an audio story in the local language. The third topic focused on texture and diversity of food choice when introducing complementary feeding in infants, during which the Healthy Baby Toolkits were introduced (Figure 6). At the end of each session, the mother and father of each household jointly decided which good practice they will implement until the next session, marking it on their goal card (Figure 1). This facilitated approach to getting participants to engage in discussion, instead of just hearing lectures, is new to many CHO and supervision to reinforce CHO facilitation skills has been critical to date.

**Figure 6.** Women in Gbangu GFC (North East Region) testing the texture of different porridges using the Healthy Baby Toolkit bowl and spoon. Credit Amos Bukari

**Gender Dialogues: local champions in place.** After performing an extensive gender and social inclusion analysis in 25 GROWING communities in the six districts in January 2023 and presenting the results at a stakeholders consultative meeting of stakeholders, the resulting feedback was incorporated into the gender strategy. All GROWING staff and implementing partners were trained from 22-24th March 2023 in CARE’s Social Action and Analysis (SAA) model, designed to support gender and social barrier norm transformation. The criteria for selecting two gender champions (one woman, one man) in each community were determined, and all 72 were selected by their communities and trained on the gender tools. To date, the facilitation of the first gender dialogue for the GFCs has been implemented by the gender champions. Entitled “Introducing your Partner to the Project”, the champions facilitated both women and men to enumerate and then discuss what support they would like to see from their partner. The champions began implementing the second module, on “Envisioning Empowerment: Vision Drawings” in August 2023 (Figure 7). The tool helps communities explore their views towards empowerment, identify key domains for change, and be able to track progress toward their goals during the project—this is in itself an empowering process.

During the formative research period, access to quality land emerged as a major constraint to women’s empowerment. Therefore, a major training in land rights and access was held in each district from 12 June through 6 July 2023. This dialogue between community members, local authorities, project staff and other relevant actors, on gender roles, stereotypes, and customary practices that affect women’s land rights and influence livelihoods, resulted in greater understanding. Each community developed an action plan for follow-up.

**Financial Services: figuring out the way forward.** The intention to use the Village and Loan Savings approach as a way to support GFCs to evolve into income-earning clubs has been complicated by the reality that other organizations had already introduced VSLAs in many of our target communities with varying success. Therefore, resources were first deployed to map out their existence (January); then conduct a “health assessment” to determine whether existing VSLAs function as per their bylaws or not. Furthermore, an evaluation was carried out to check whether existing VSLAs already had sufficient GFC members and could be strengthened, or whether the formation of new VSLAs, composed only of GFC members, was required in a given community. The health assessment was carried out from 29 May to 8th June 2023 on VSLAs with GFC membership (145 of the 198 VSLAs mapped). 84 were found to have “uncertain health condition.” Assessment findings are expected in September 2023 and will stipulate the number of new VSLA groups to be formed.

In preparation for the VSLA intervention, 35 project and partner staff members were trained in seven standard VSLA modules; they subsequently delivered step-down training to 37 identified Village Agents (24 men; 13 women), selected by the 36 communities using criteria provided by GROWING.

**Income-Earning Opportunities: doing the ground work for sustaining GFCs.** The goal is for the GFCs in year 2 of each cycle to become self-sustainable income generating units that will be well-linked to marketing opportunities in 1 of 3 potential areas: a) selling fresh nutritious crops (that is, Farming as a Business Clubs); b) processing OFSP baked or fried products (Agro-processing); or c) rearing cavies (Cavia porcellus) for sale and consumption. Considerable prior experience exists in implementing Farmer Field Business Schools (FFBS), with a well-developed toolkit in existence. Therefore, 35 GROWING staff, implementing partners and Department of Agriculture crop officers were trained on FFBS tools from 28 February through 3 March 2023. These marketing and business skills development tools. To date, the facilitation of the first gender dialogue for the GFCs has been implemented by the gender champions. Entitled “Introducing your Partner to the Project”, the champions facilitated both women and men to enumerate and then discuss what support they would like to see from their partner. The champions began implementing the second module, on “Envisioning Empowerment: Vision Drawings” in August 2023 (Figure 7). The tool helps communities explore their views towards empowerment, identify key domains for change, and be able to track progress toward their goals during the project—this is in itself an empowering process.

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tools can be adapted for use in all three income-earning options. More than half of the GFCs will evolve into Farming as Business Clubs. However, the technical approach to be used for the remaining two clubs has to be developed and tested during Cycle 1.

**Agro-processing: recipe development and costing.** With the support of an expert from Euro-Ingredients Ltd. (EIL), the incorporation of OFSP puree into the main existing processed products, including koose, bobrot, and bread, was carried out with the GROWING food technologist and local agro-processors, with clear economic and quality benefits exhibited when wheat flour is partially substituted (30-50%) with OFSP puree (Figure 8).

Manually operated machines were imported and tested to produce puree (Puree Pro) or cut roots into chips or crisps (Cut-a-Chip) (Figure 9). Training materials are being developed to use with six pilot GFCs (one per district) in the fourth quarter of 2023.

In addition, to facilitate the use of OFSP puree on a larger scale in the major urban market, Tamale, a half-day workshop was held in April 2023 to inform six medium-scale agro-processors about the potential of OFSP puree as a functional ingredient. As a consequence, one local bakery was selected based on their willingness to co-invest with GROWING on developing on OFSP puree factory to have support to develop further a business case for investment before the end of 2023.

**Cavy rearing: a potential source of meat and income.** There is limited expertise in cavy rearing in Ghana. As a consequence, the GROWING small livestock officer was sent to study for 3 weeks with an expert in cavy rearing working at the University of Abomey-Calavi in Benin, during which a draft cavy rearing training program was developed and breeding stock sourced to bring to Ghana. Two men with rabbit rearing experience in the Tamale area were engaged to be cavy breeders, producing stock to be supplied to GFCs selected to raise cavies (Figure 10). Later, a third breeder was added in Damango (West Gonja). Breeders received quality cages and training in cavy management. The Beninian stock did not adapt well, and a cavy supplier was identified in Kumasi to obtain locally adapted breeds and increase herds. Regrettably, the reproductive rates of the cavies have been below expectations; there have been significant losses during the rainy season due to pneumonia; and one breeder dropped out after all his cavies and rabbits were stolen. In addition, there was staff turnover on the GROWING side, with a new small livestock officer commencing duties in August 2023.

Market linkage interventions and demand creation activities will begin in the next quarter and will be critical for supporting the evolution into income-generating clubs in year 2.

**Coordination.** The management team holds internal weekly planning sessions and has initiated quarterly meetings with key stakeholders in each of the three regions. The Technical Working Group meets annually to review progress, and the Project Steering Committee (Figure 11) meets twice a year. The implementation of the communication and knowledge management strategy was initially focused on digital tool development. Increased outreach about project interventions through social media and other means began in August 2023.

**What are we learning?**

As expected with such a complex intervention, there is a long list of lessons learned from the ongoing intervention which will contribute to improving our approach in Cycle 2. Key lessons include:

1. The participatory facilitated approach used in the nutrition component is quite different for the CHOs from the standard approach, which has required additional reinforcement by the trainers. CHOs, however, appreciate the active engagement of participants in the learning process.
2. With digital monitoring of participation, the drop in men attending nutrition sessions coincided with the onset of the planting season. Discussions ensued as to possible alternate meeting times and engagement with community leaders to address the problem. It is clearly a challenge to align training activities on such diverse topics with the demands of a unimodal production agricultural calendar. The establishment of Cycle 2 GFCs will start in late 2023, so that learning engagements are underway by January 2023, reducing the number of learning sessions during peak periods of the agricultural calendar.

3. Gender Champions for Cycle 2 should be recruited in a timely manner, so that gender dialogues are initiated prior to the start of the nutrition modules, so that men better understand why their participation in all aspects of the intervention is highly desirable.

4. Nurseries will be established in each district for the multiplication of papaya and moringa seedlings for subsequent cycles. Establishing a nursery in each district will help minimize transport distance that causes low survival and enable local farmers to get plenty of vigorous seedlings locally.

5. The challenges in breeding and maintaining cavies have been greater than anticipated. Hence, the experience from working with breeders and pilot GFC cavies groups in Cycle 1 will be carefully assessed to determine whether the cavies will be included as an income-generating option in subsequent cycles.

6. Coordination of training activities between different sectors is required to avoid overburdening GFCs with multiple training events over a limited period. During the next six months, we will engage with selected GFCs in outcome mapping and hold discussions to capture participant feedback on what they hope to achieve through their participation and how the intervention can be improved.

Figure 11. The Project Steering Committee at their first meeting in October 2022. Credit Sherifdeen Abubakari

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Project Period: April 2022-December 2026

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