

LEARNING BRIEF: Apolou Activity in Karamoja



Gardening Under Drought Conditions: Using the Permagarden Approach to Improve Food Security and Income Generation for Mother Care Group Participants in Karamoja

August 2023



SERIES

This learning brief is part of a series bringing together experiences and lessons learned from the Apolou Resilience Food Security Activity (2017—2023). The briefs are designed for practitioners, including local government representatives, civil society organizations, and other actors working on issues related to climate change, water point sustainability and management, and sanitation.

ABSTRACT

This learning brief presents select findings and lessons learned from implementing the Permagarden Approach under Apolou, a 6-year USAID Bureau for Humanitarian Assistance (BHA)-funded activity in Karamoja. It discusses the impact of permagardens on participants' food security, income, and ability to contribute to group savings accounts. It also explores the factors that motivated participants to adopt permagarden techniques and provides recommendations for how to improve the roll-out of the Permagarden Approach to new populations. This brief will be useful for development practitioners considering permagardens as a way to improve food security and household resilience in semi-arid regions.



DISCLAIMER

This learning brief was made possible by the generous support of the American people through the United States Agency for International Development (USAID). The contents are the responsibility of Mercy Corps and do not necessarily reflect the views of USAID or the United States Government.

PHOTOS

Apolou Resilience Food Security Activity, 2023. All photos reproduced with permission.

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ACRONYMS

BHA	Bureau for Humanitarian Assistance
FGD	Focus Group Discussion
KII	Key Informant Interviews
MCG	Mother Care Group
RFSA	Resilience Food Security Activity
SILC	Savings and Internal Lending Community
USAID	United States Agency for International Development

Apolou is made possible by the support of the American people through the United States Agency for International Development (USAID) and is implemented by Mercy Corps and partners.

ACTIVITY BACKGROUND

The Apolou Resilience Food Security Activity (RFSA) was a United States Agency for International Development (USAID) Bureau for Humanitarian Assistance (BHA) initiative that worked to boost food and nutrition security for 310,000 people in the Kaabong, Karenga, Kotido, Moroto, and Amudat districts of Karamoja, Uganda (Figure 1). From 2017–2023, Mercy Corps led a consortium of partners—Save the Children, Whave, Karamoja Peace & Development Agency, Riamiriam Civil Society Network–Karamoja, Nakere Rural Women Activist, and Tufts University Feinstein International Center—to implement the activity. Apolou worked with households, community leaders, the Ministry of Karamoja Affairs, the Government of Uganda, the private sector, and others to address underlying causes of chronic food and nutrition insecurity and build community and household resilience. Apolou adopted four purposes grounded in social and behavioral change to support gender-transformative and resilience outcomes:

- **Purpose 1:** Inclusive and effective governance contributes to food and nutrition security;
- **Purpose 2:** Adolescent girls, pregnant and lactating women, and children under five are nutritionally secure;
- **Purpose 3:** Reduced incidences of water, sanitation, and hygiene (WASH)-related diseases; and
- **Purpose 4:** Improved livelihoods and income support household food security.

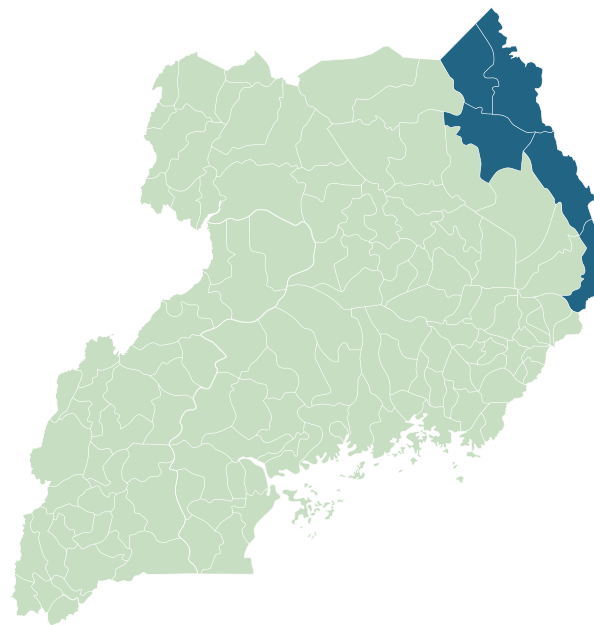


Figure 1. Apolou’s five project areas highlighted in blue: Amudat, Kaabong, Karenga, Kotido, and Moroto.

ACTIVITY CONTEXT

Apolou operates in Uganda’s Karamoja region, a semi-arid area inhabited primarily by pastoralists and agropastoralists. Karamoja is in the midst of a social, political, ecological, and economic transition as it continues its recovery from decades of conflict and instability. Despite relative peace, food and nutrition insecurity persist. Changing climatic patterns are increasing the frequency and duration of droughts and dry spells, which strain traditional food production systems. Karamoja is the most nutritionally vulnerable region in Uganda and is the third most vulnerable to stunting in East Africa. Undernutrition is a significant barrier to development in Karamoja. Apolou implemented the Permagarden Approach as a way to increase households’ access to food in this water-scarce area.

INTERVENTION DESCRIPTION

In response to deteriorating food security in the region due to persistent drought, Apolou conducted a Permagarden Approach training program for 1,500 mothers engaged in its Mother Care Groups (MCGs). The Permagarden Approach is a combination of permaculture and biointensive agricultural techniques honed and adapted by Mercy Corps and partners for the smallholder farmer context. The Permagarden Approach prioritizes fundamental agricultural best practices, such as building soil health, increasing biodiversity, and efficiently using all available water sources to improve crop health and raise productivity. Permagardening is considered a climate-smart agricultural technique because it harvests and banks water deep within the soil where it is accessible to plants, in addition to increasing water reserves within the soil through the addition of organic material. Banked water is then available to protect crops from water stress in the event of erratic rains. In addition to protecting crops from climate shocks, building biodiversity within the household compound can provide additional resources for families who would otherwise be susceptible to devastating losses should their primary crop fail. Unlike traditional home garden projects, the Permagarden Approach puts the household in charge of the overall garden design, including deciding what crops are grown and how they are used. During the permagarden design phase, the household is actively engaged in setting up a garden that meets their objectives and personal preferences.



A Mother Care Group participant in Amudat District tends to her permagarden and collects food for household consumption. (Photo credit: Mouris Opolot)

Apolou first conducted an intensive 5-day Training of Trainers workshop to prepare community-based trainers to cascade permagarden techniques to mothers within their communities. Local government extension workers provided additional support to the trainers and mothers, with the intent to continue integrating improved soil and water conservation techniques into the community after project completion. After the initial training, Apolou provided trainers with a voucher to claim a small amount of seeds and a watering can from local agro-dealers as encouragement. Trainers were expected to conduct trainings and follow-up visits with the mothers in their area to provide technical assistance as they established and maintained their permagardens. Apolou staff shadowed the community-based trainings and provided backstopping when necessary. They also conducted routine monitoring using the [Permagarden Minimum Standards Checklist](#).¹ Mothers with expressed interest in improving their food security and who had access to a small piece of land were selected from villages classified in Phase 2 and 3 of the Integrated Food Security Phase Classification scale. Because the selected mothers were already engaged in MCGs, trainers were also able to encourage them to use the funds from their permagarden sales to increase their MCG-related Savings and Internal Lending Community (SILC). In total, 50 trainers and 1,500 mothers were targeted across the five Apolou districts. Permagardens were established in the wet season starting March 2022.



Double-dug permagarden beds dug on contour surrounded by a protective swale with a spillway cut into the berm. Beds will eventually be planted and mulched and fed by the rainwater captured by the swale. (Photo Credit: Warren Brush)

1 Brush, W., Cole, T., Lambert, K., & Mottram, A. (2021). Permagarden | Technical Checklist Guidance. Produced by Mercy Corps as part of the Strengthening Capacity in Agriculture, Livelihoods, and Environment (SCALE) Associate Award.

Assessing the Effectiveness of the Approach

Apolou conducted two rounds of surveys and focus group discussions (FGDs) with trainers and mothers from Karenga, Kaabong, Kotido, Moroto, and Amudat districts in the wet season of 2022 and the dry season of 2023. They also conducted key informant interviews (KIIs) with government officials and government extension agents who were engaged with the project.

The survey sought to understand the food security and income outcomes resulting from the program. FGDs and KIIs evaluated why some households chose to maintain a permagarden and others did not.

Learning Questions

- Were mothers who used the Permagarden Approach able to increase their income and SILC contributions?
- Were mothers who used the Permagarden Approach able to increase their households' food consumption?
- Why do some households choose to establish and maintain a garden whereas others do not?
- What could be done to better support households who have established a permagarden and now need to maintain it?

Apolou surveyed 90 participants in September 2022 and 82 participants in February 2023. Project participants were randomly sampled within each district; sometimes the same participant was surveyed twice, however data was not matched to do a longitudinal analysis. Mothers who participated in the MCGs were primarily targeted, yet sometimes it was necessary to interview other household members. Apolou conducted a total of 10 FGDs (five FGDs in September 2022 and five in February 2023) and four KIIs.

Impact and Results

Permagarden Adoption Results

Most survey participants implemented five to seven permagarden techniques out of 15 recommended techniques in their garden. Double digging and mulching were used by over 75% of participants across both seasons. However, few participants constructed water harvesting structures such as swales and half-moon berms, even though rainwater harvesting is a core principle of the Permagarden Approach. Swale use started high in the wet season (67%) but dropped to only 35% in the dry season. Half-moon berms were only observed in one-fifth of the participants' gardens. These data points are most likely a reflection of enumerators being poorly trained to identify swales in the gardens they visited rather than an accurate representation of how many participants had actually installed swales in their compounds.

Approximately half of the survey participants planted five or more crops in the garden (52% and 45% in the wet and dry seasons, respectively) although a significant number (22% and 18% in the wet and dry seasons, respectively) had only one or even no crops in their garden. Participants were encouraged to plant a wide diversity of crops in their garden. They chose to plant 27 different kinds of food crops, which included cereals, pulses, and many different types of vegetables, including local indigenous greens. These food crops included: maize, beans, cassava, cowpeas, sweet potatoes, groundnuts, sorghum, soybeans, green grams, sunflowers, onions, okra, kales, cabbages, green peppers, eggplants, tomatoes, spinach, chili peppers, pigeon peas, amaranth, spider plants, cucumbers, pumpkins, white beans, and carrots. They grew 11 different



Loumo Jesca, Jumbe Village, Amudat Town council, Amudat District (Photo Credit: William Obonyo Otoke)

fruit trees and vines, including orange, guava, papaya, mango, avocado, banana, passionfruit, watermelon, kei apples, moringa, and edome. Their permagardens also included non-food crops such as balanite tree, milk bush, pondo tree, epongai, ekirogom, lokkwan lokorei, acacia tree, echuchuka, eucalyptus, and neem.

“I think [permagardening] is the best approach [in Karamoja] so far because it provides the community with nutritious foods since they plan different types of foods...that most of them did not plant before. To me, if all farmers could adopt this kind of farming, food security could be reduced in Karamoja.” – Extension agent in Amudat District

Food Security Results

Nearly all survey participants (99% in the wet season and 95% in the dry season) reported being able to eat something from their gardens during the ongoing season. This implies that the permagardens provided some degree of food consumption smoothing—including through the dry season—although the extent to which this reduced households’ negative coping strategies is not known. Participants said they and their children consumed onions, kale, cowpeas, tomatoes, and eggplants most commonly. For many, these are new crops that they did not eat before they had a permagarden. In the wet season, 42% of participants who harvested from their garden consumed four or more different crops, and 32% harvested between one to three crops. These numbers stayed consistent in the dry season; 40% of people who harvested from their garden were able to harvest four or more crops and 31% were able to harvest between one to three crops.

In addition to direct consumption from their gardens, the majority of survey participants (68% in the wet season and 80% in the dry season) also said they used the income generated from the permagarden to purchase other food items for the household, including cooking oil, salt, seasonings, beans, maize, and even meat. Approximately 10% of those who used their funds for food purchased vegetables like tomatoes, eggplants, Sukuma wiki, cowpea, and sweet potatoes to add to their diets. In the wet season, 33% of people who used funds from their permagardens to purchase food bought beans and 26% purchased maize. These numbers rose to 41% (purchased beans) and 36% (purchased maize) in the dry season, which suggests the permagardens provided an important source of income during the off-season, allowing households to stabilize their consumption of staple foods throughout the year. In fact, when asked to what extent the permagarden helped their household maintain their food supply in the dry season on a scale of one to 10 (1 = helped very little and 10 = helped a lot), 43% of survey respondents responded seven or above.



Small permagarden beds can provide nutritious vegetables that are easily accessed by a household. (Photo Credit: Thomas Cole)

Ninety-eight percent of survey respondents in the wet season and 96% in the dry season said that they would use the Permagan Approach again now that they have experience with it. This positive response was echoed in the FGDs where participants expressed how valuable it was to have easy access to a wide range of foods. Many participants noted that it was the convenience of having food directly next to the kitchen, combined with the ability to use garden funds to aid in food purchases, that allowed them to improve food security within their households.

“What motivates me to have a permagarden is when I travel, my children can get food.” – Community based trainer in Amudat District

“Planting it as food with the alternative source of income attracted me to establish a permagarden, especially its availability and accessibility.” – Mother in Moroto District MCG

“It is easy since it’s very close to the house. Even though one comes in late in the evening, when I make food for the children I can just cross to the permagarden and pick for a meal that evening” – Community based trainer in Moroto District

Income and Savings Results

The majority of survey participants (72%) said that they were able to sell crops from their garden during both seasons. They reported earning, on average, 35,069 UGX (\$9.30 in U.S. dollars (USD)) in the wet season and 50,853 UGX (\$13.49 USD) in the dry season. Survey participants said they used approximately half of their garden income for SILC contributions (45% on average in the wet season and 54% in the dry season).

The financial benefits of having a garden were frequently mentioned during FGDs as a reason to establish and maintain a garden. Participants consistently said that they appreciated selling their produce to finance household purchases. Many participants also appreciated reducing their food expenditures by consuming the vegetables available in their garden. SILC contributions were also mentioned as a reason to establish a permagarden, however less so than being able to purchase much-needed household items or pay for larger expenses, such as school fees.

“I wanted to generate income to enable me to buy other household needs like salt, soap, and clothes after selling the harvested crops.” – Participant in Kotido District

“Those who have established them have seen the benefit of the permagarden, like when one sells and can earn money, which can help purchase the other food items...” – Participant in Moroto District

“Crops harvested were sold, people benefited by selling. Others used money for saving, paying school requirements, others bought assets like goats.” – Community-based trainer in Kotido District

Motivating Factors to Establish and Maintain a Permaganarden

Despite the positive food security and/or income gains many participants experienced, they expressed mixed opinions on the process of preparing and maintaining permagardens during the FGDs. Some participants viewed permagardens as extremely water efficient and noted that their crops grew quickly in a permagarden. These participants were likely to be satisfied with their permagardens and motivated to continue. However, some participants considered permagardening techniques to be very labor-intensive and were uninterested in maintaining a garden. Many did not want to dig as deep as is required for a permagarden; others did not want to carry manure or water to the garden. This mixed opinion was also seen in KIIs held with a district production and marketing officer and three extension agents engaged in the project. Three of the four individuals were extremely supportive of the permagarden techniques introduced and said they were appropriate for the conditions in Karamoja. One was less supportive, pointing to the local preference for rearing livestock and the need to place gardens near rivers as the primary reasons why he did not see permagardens as an appropriate solution for Karamoja.

However, participants who saw good outcomes from their garden were highly motivated to continue. They appreciated gardens that could provide their household with a consistent source of easily accessible, diverse foods. Some mothers mentioned that they noticed the health and nutrition of their children improving. They valued the ease of not having to go to the market to purchase food, which reduced their household duties and allowed them to easily diversify their household’s diet. An extension agent interviewed in Amudat District observed that the permagardens were able to provide households with vegetables that are often not available for purchase in local markets. He also thinks the gardens improved participants’ access to nutritious foods because vegetables are readily available in the garden, whereas previously households could only access vegetables once a week when they made the trip to faraway markets.

FGD participants consistently mentioned that they required easy access to water, labor, land near their homes, and a sufficient supply of seeds and farm tools in order to establish and maintain a permagarden. As is true with any garden project, participants were much less likely to maintain their gardens if they did not have access to these fundamental garden inputs. Water access was considered especially essential in this prolonged drought year. Gardens that did have water harvesting structures were better than those without, however total rainfall was low enough that all gardens would have benefited from supplemental irrigation. One extension agent in Kaabong District noted that the water harvesting structures never had the opportunity to harvest large amounts of water because of the scant rains during the 2022 wet season. She said, “If only many of the community members could adopt this and establish gardens during the vigorous

rainy season, they could harvest enough water for production.” Participants whose gardens were far from a water source were much less likely to maintain it over time. Likewise, participants whose gardens were destroyed mid-season—either from animals, pests and diseases, or theft—were often unwilling to reestablish the garden and ended up abandoning it. These requirements, along with the internal motivation to improve their food supply and have access to supplementary income, appeared to be prerequisites for participants to establish and maintain a permagarden.

To better support farmers as they try new permagarden techniques, FGD participants recommended greater trainer support and follow-up in order to help them problem-solve around water, pests and disease, and fencing issues. They also recommended that project staff reinforce certain messages, such as the financial benefits of a productive garden, to farmers skeptical of the time investment required to establish and maintain a permagarden.

However, even with additional follow-up by trainers, internal motivation to maintain a garden is paramount to success.

As one trainer in Moroto District expressed, “community members are always claiming they are busy and even when you make an appointment with them...they tell you they are busy over and over again.”



A MCG participant in Amudat District walks past her well-fenced permagarden housing a kale crop. (Photo Credit: Mouris Opolot)

Quotes from participants with positive experiences:

“When this garden receives rain, it holds water and can be used for a good period for the crops” – Community-based trainer in Amudat District

“The permagarden is easy to water and fence unlike when it’s put in an open and large piece of land which requires a lot of water and fences to cover all.” – Community-based trainer in Moroto District

“Gardens within water points are doing well” – Community-based trainer in Kotido District

“We also choose to maintain the permagardens because it keeps growing crops for quite a long period of time for us.” – Participant in Kotido District

“Why we are enduring is because people really like greens. Buying from town becomes a problem. Our children are used to greens—if it’s not there they ask for it. But also, greens treat diseases.” – Mother in Moroto District

“It is easier for people who have equipment like hoes, watering cans, and pangas to establish the gardens... Some households have existing live fences which makes it easy to establish permagardens.” – Participant in Kotido District

Quotes from participants with negative experiences:

“Some households are far from water sources which makes it hard for them collect water for watering crops during dry spells.” – Participant in Kotido District

“Some people are alone at home, they cannot do everything by themselves like fetching water, digging etc....Some people lack space for establishing a permagarden especially those who are just squatters.” – Participant in Moroto District

KEY LEARNINGS

- **The Permagarden Approach was successful at producing food and generating income for households in Karamoja.** Participants who maintained their permagardens were able to produce food to supplement their household diets. They also successfully sold surplus food and used this in a variety of ways to support their household's needs, including through the purchase of other food items.
- **Although some participants noted that their permagardens retained water and protected crop health better than other garden models, others felt that their gardens needed to be located near a water point to be successful in this prolonged drought year.** Despite establishing water harvesting structures, rainfall amounts during this prolonged drought were still insufficient for many participants to achieve healthy crop growth. Participants who had to walk long distances carrying water were often discouraged from continuing with their permagardens. Participants felt that permagardens were most successful if they were placed in areas where water could be accessed when it was needed as an additional backup measure.
- **Participants who struggled to access basic garden inputs, or who suffered from crop failure, were often demotivated and abandoned their permagardens. Some participants never gained the motivation to maintain a permagarden.** After receiving the Apolou permagarden training, some participants were motivated to continue, and others were not. Participants who lacked easy access to basic inputs, such as land, seeds, or tools, often ended up abandoning the technique early on. Participants who had an easier time establishing their permagardens saw early successes and were motivated to continue. However, there were some participants who were not interested in adopting gardening and preferred to continue their other income generating activities—primarily rearing livestock. These participants did not want to do the work to maintain a garden and pointed to the labor requirements needed to double dig a garden bed or carry water as reasons.

RECOMMENDATIONS

- **Continuous follow-up is necessary.** When introducing a new agricultural approach such as permagardening, it is necessary to provide continuous technical assistance to ensure participants can achieve good results in their first season. Frequent trainer visits to farmers' fields are essential in maintaining garden quality and farmer motivation. Trainers can advise farmers on how to properly implement the new techniques, such as by desilting and re-constructing an improperly established swale. They can also relay important information across the community, such as how one farmer is managing a pest infestation or which crops are the most resilient under the current weather conditions. Participants who struggled with the techniques, and who ultimately abandoned their garden, could have been redirected earlier on. Farmers are often motivated to try more if they see early successes, however they will quickly revert to their previous practices in the absence of positive results. It then becomes very difficult to change farmers' minds if they have formed a negative impression of a new technique.
- **Take time to carefully select participants.** Some participants will be eager to try the Permagarden Approach to see if it improves their household situation, but others may adopt a "wait and see" attitude instead. Particularly in areas like Karamoja where participants do not have a history of cultivating crops, certain individuals will simply be uninterested in deviating from their current lifestyle to grow crops. In areas where crop cultivation is a new concept, program staff can aid its adoption by first focusing the project's efforts on committed individuals. They can also work to establish visible examples of success that educate and inspire more hesitant individuals. A model garden that demonstrates all the Permagarden Approach techniques as they are intended to be implemented can motivate individuals who were previously uninterested in devoting time and energy to a garden. Likewise, farmer-to-farmer visits to the gardens of successful community-based trainers may also motivate community members to experiment with permagarden techniques on their own land.
- **Properly implement the Permagarden Approach to mitigate the risk of crop failure.** Crop failure is extremely demotivating to participants. While it is impossible to prevent all instances of crop failure, the Permagarden Approach contains many climate-resilient strategies intended to protect crops and mitigate the risks of crop failure to participants. Adhering to the Permagarden Approach Minimum Standards will help prevent unnecessary

instances of crop failure. For example, program staff can ensure that permagardens are always fenced in to protect them from damage from free-range animals. They can encourage participants to plant a diversity of species that are likely to produce a harvest even if one species falls victim to a pest infestation or disease. They can also encourage participants to use their wastewater in their gardens and show them how to design a garden in a way that makes it easy for households to regularly use this resource, or any other form of supplemental water, without adding an additional labor requirement. Group work can also reduce the labor burdens of establishing a garden while also giving participants additional opportunities to practice using the new techniques. Last, program staff can encourage participants to visit their gardens regularly to observe if other problems are arising that need to be addressed.

- **Devise a market-based solution for project farmers to have access to seeds and tools.** Projects can consider direct distribution of these inputs, however they should also consider other methods for helping farmers gain access to the resources required to build and maintain a garden. The Permagarden Approach encourages community engagement in problem solving around challenges that arise during garden establishment and maintenance. Activities such as a resource walk can uncover existing resources within the community that do not require project financing. Project staff could suggest a seed exchange event or communal work party to share tools and reduce labor demands. While these activities may not fill every resource gap, project staff can engage the community in a discussion around market-based solutions prior to resorting to direct distribution of garden inputs.



Janet Akongo, A lead mother
from New Karenga Village, Karenga
Town Council, Karenga District.
(Photo Credit: William Obonyo Otoke)