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## Kitchen Gardens in Burundi - “the new way to grow vegetables”

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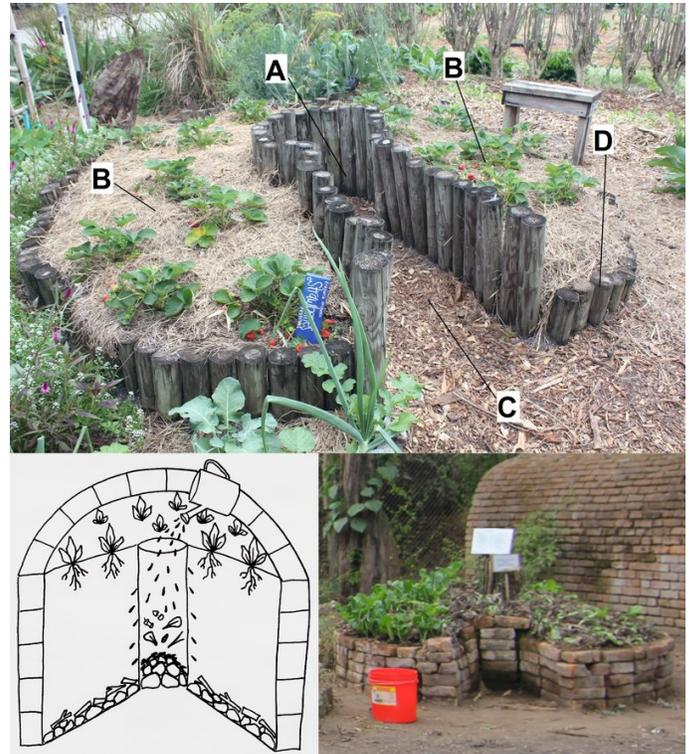
*Editors: Sara Delaney presented at ECHO’s November 2015 International Agriculture Conference. One project she mentioned had remarkable adoption rates, and we thought it would make a good case study to share in EDN. In the course of introducing new ideas or practices, why are some accepted more easily, quickly or widely than others? This article proposes some reasons for the initial success of kitchen gardens in Burundi, and also shares a method for trying to measure the impact that kitchen gardens will have on the food security and nutrition of the families who use them.*

The country of Burundi is one of the smallest and most densely populated on the African continent. If you spend a little time there, you will see people on the streets of the city, walking on the roads between city and village, out in the hilly fields... everywhere!

Burundi is also very hilly. The topography is almost continuous hills, leading down to the shores of the large Lake Tanganyika. This makes for beautiful scenery, but some big challenges. The hills are prone to soil erosion, and land access is difficult and becoming more so with the growing population. Infrastructure, seed supply and market access are limited. East African crop diseases such as *Banana Xanthomonas Wilt* and *Cassava Mosaic Virus* have made their way to the country.

Burundi received a score of 35.6/extremely alarming on the 2014 Global Hunger Index (IFPRI 2014), placing it at the very bottom of the rankings for the third year in a row. Under-nutrition has been identified as the foremost concern in all regions of the country.

Burundi is also still recovering from a widespread conflict which lasted from 1993-2005. Further, from April 2015 to the present, political unrest and conflict stemming from a President over-staying term limits has resulted in significant migration of families, disruption of food supply, and high levels of insecurity.



**Figure 1.** Examples of keyhole gardens, built with wood (top, ECHO, Florida), bricks (bottom right, Tanzania) and a cross-section (bottom left). Compost can be placed in the center (A), with an optional covering, to supply nutrients to surrounding plants. The planting area (B) is filled with a mix of soil and organic material, topped with a layer of mulch. If drainage is an issue, a layer of rocks or other coarse material could be placed at the base of the planting area. The keyhole (C) provides access to the center (where compost can be placed) and to the planting area. An outer wall (D), constructed with locally available material such as wooden posts, rocks or used rice sacks, keeps the garden contained.

*Source: Tim Motis, Betsy Langford and Nate Flood*

## Community Development Program

To help address these complex issues, the Anglican Church of Burundi's community development office, in partnership with Episcopal Relief & Development in New York, has conducted a national integrated agriculture, environmental restoration and health program since 2008. As a Program Officer with Episcopal Relief & Development, I have worked closely with the team in Burundi since 2012.

Through the agriculture program, improved seed varieties are sourced from the in-country research center, and seed multiplication centers are managed in conjunction with farmer groups. Farmers also participate in training on techniques

to improve yields and increase resilience to climate stresses. Alongside these efforts, land on hillsides is being restored through the planting of trees and digging of anti-erosion trenches with stabilizing grasses.

In 2013, I worked to initiate an additional partnership between the Anglican Church of Burundi (referred to as PEAB in French) and the International Agriculture and Rural Development (IARD) program at Cornell University. After some brainstorming, we decided to first use this team to add a focus on family nutrition to the program activities. Specific objectives were to:

1. Contribute to household food security and diet diversity in rural Burundi through the introduction of a kitchen garden technique;
2. Test and document good practices for kitchen garden introduction, dissemination, construction and maintenance in the rural Burundian context; and
3. Facilitate a sustainable seed supply system for selected vegetable varieties through support for seed saving and exchange and identification of sources for quality seed.

## **The Kitchen Gardens**

After some research and conversations within Burundi, the team decided to introduce a kitchen garden model, based on the 'keyhole' garden concept, to a group of 60 interested women within the communities where PEAB was actively working. The kitchen garden (Fig. 1) includes an outer wall made from local materials, a central composting basket, and raised beds (FAO 2008; Walker 2012).

The kitchen garden model has many benefits. It requires only a small area, and can be made inexpensively or even at no cost by using readily available or recycled materials. The design can easily be modified. The garden is supplied with nutrients by the compost basket in the center. Especially when mulched, the garden requires less water than a typical garden.

PEAB and IARD led a series of trainings on kitchen garden construction techniques, and then—following construction—on composting, crop management, seed saving, nutrition, and cooking techniques. Each household received 4 to 10 training sessions, over a period of two or three months. Staff later followed up with visits that included opportunities to receive advice and troubleshooting.

The program coordinators also decided to distribute starter seeds, due to low availability in the area and the desire to target particular nutrient groups. Seed varieties were sourced from small shops (imported vegetable seeds) and from the local market, and included leafy greens, cabbage, carrots, squashes, tomatoes, peppers, amaranth, eggplant and onions (Siele 2015).

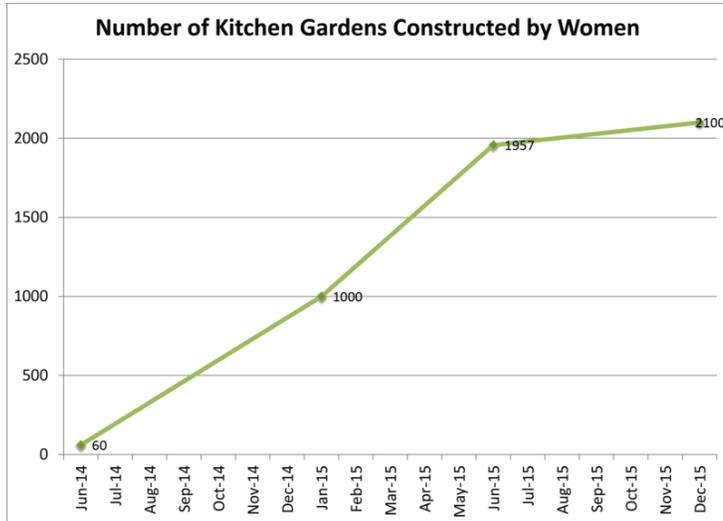
## The gardens take off!

The kitchen garden model has proved to be hugely popular amongst rural households in Burundi (Fig. 2). Sixty gardens were originally constructed. Between mid-2014 and the end of 2015, over 2,000 gardens (Fig. 3) were constructed by individual women, in 3 provinces and at least 15 communities, having spread from the south of the country up to the west and center. Women are growing a mix of vegetables, including amaranth, eggplant, tomatoes, carrots, hot peppers and onions. They use the produce primarily for home consumption, and also for cooking for guests, selling, trading and giving to neighbors.



**Figure 2.** A woman shows two kitchen garden techniques: a one-tier garden with mulching (background) and a garden-in-a-sack (foreground).

*Photo: Sara Delaney*



**Figure 3.** The number of kitchen gardens rapidly multiplied at the start!

During a visit to Burundi in late 2014, we were able to visit with a number of women, both in the original group of 60 and in another area that had started more recently. Through informal conversation, we asked them how the gardening was going, why they had decided to create a garden, and (for those who had started to harvest) what benefits they had realized so far. Many of the responses were expected: a desire for more food available for the family close to home; the challenges of accessing seed; and dealing with pests.

Some responses were more surprising. When I asked one woman who had recently finished constructing and seeding her garden why she had decided to do so, she looked at me and said, *“Well, it’s the new way to grow vegetables.”* As if I was the last one to know. I laughed happily in my head as she explained further, while trying to keep a serious face. I didn’t want her to realize that a member of the team who had originally proposed the gardens wasn’t up to speed with how ‘on-trend’ the kitchen gardens had become!

Another woman told us of a benefit beyond increased nutrition or income. She explained that she likes having her garden nearby, because now, if visitors unexpectedly show up, she always has something to cook and offer!

Just as exciting as the spontaneous spread of kitchen gardens, many women are innovating and adjusting the original design based on available materials and individual preference. Walls are being made from mud bricks, used rice sacks, and banana leaves. Women are choosing to use one, two or three tiers (Fig. 4), and to focus more or less on certain vegetables.

The kitchen garden work has also inspired women and men to initiate the formation of farmer associations in their communities, in order to pool resources and to grow larger plots of vegetables for market sale.



**Figure 4.** PEAB staff members speak with a woman about her multi-tiered kitchen garden.

*Photo: Sara Delaney*

## Factors in the garden adoption

With this technique spreading so quickly, we have been working to keep up! We have also been looking at what factors may have helped the adoption to be so fast and widespread. Many other techniques that have been shared through the agriculture program for years (such as crop spacing, or compost-making) have not proved as popular. We will need to wait longer to see if more women continue to build and use similar gardens, and to determine the longer-term sustainability of the activity. However, a few factors seem to have been important:

- Exchange visits. Following the initial enthusiastic training on kitchen garden techniques, the program facilitated exchange visits for women from other areas to see and learn from the original adopters—women like themselves.
- Local facilitators to provide support. PEAB’s community-level facilitators in each diocese provide extension services—leading follow-up trainings, offering support to families, and monitoring progress. These facilitators are local to the area and are farmers whom the women know and trust.
- Low-cost and local to enable spread to neighbors. Because the gardens can be made without any outside inputs, women can easily share the idea with their neighbors and friends, who can then start even if they haven’t been to an exchange or training. Out of the ~2100 gardens constructed as of December 2015, ~580 (30%) resulted from spontaneous spread of information from neighbor to neighbor. The program coordinator shared that most women showed at least one other woman how to make a kitchen garden; not all of them will adopt the idea, but many do, and very likely more gardens have been made than have been recorded.

## Measuring impact

[Note: as will be explained later in this section, political unrest prevented the planned follow-up measurements for the project. However, information about the measurement tools that were used might be helpful for other readers—so the information is still included here.]

To help us gauge how the addition of gardens is helping us to meet the objectives of improving household food security and family diet diversity, we decided to use two available measurement tools. These were USAID's Household Hunger Scale (Ballard *et al.* 2011 (<http://www.fantaproject.org/sites/default/files/resources/HHS-Indicator-Guide-Aug2011.pdf>)) and FAO's Women's Dietary Diversity Score (WDDS) and Individual Dietary Diversity Score (IDDS) (FAO 2010 ([http://www.fao.org/fileadmin/user\\_upload/wa\\_workshop/docs/FAO-guidelines-dietary-diversity2011.pdf](http://www.fao.org/fileadmin/user_upload/wa_workshop/docs/FAO-guidelines-dietary-diversity2011.pdf))), translated for the local language.

The Household Hunger Scale asks a family a set series of questions about their experiences over the last thirty days, including if there was ever no food to eat, if a member ever went to sleep hungry, or if anyone went a whole day and night without eating. Choices include *rarely*, *sometimes*, and *often*, and the responses are then scored using a standardized method to produce a score from 0 to 6, or "no hunger" to "severe hunger."

The diet diversity survey, by contrast, asks respondents to recall everything which they ate or drank over the previous 24 hours. All of their meals and snacks are recorded, with meals such as soup broken down to record main ingredients. Afterwards, we sort the items into specified food groups (based on the types of food needed for adequate women's or child's nutrition) and total how many food groups the individual consumed. Similar to the HHS, the total food groups are then scored using a scale from low diversity (three or fewer food groups), to high diversity (more than six groups).

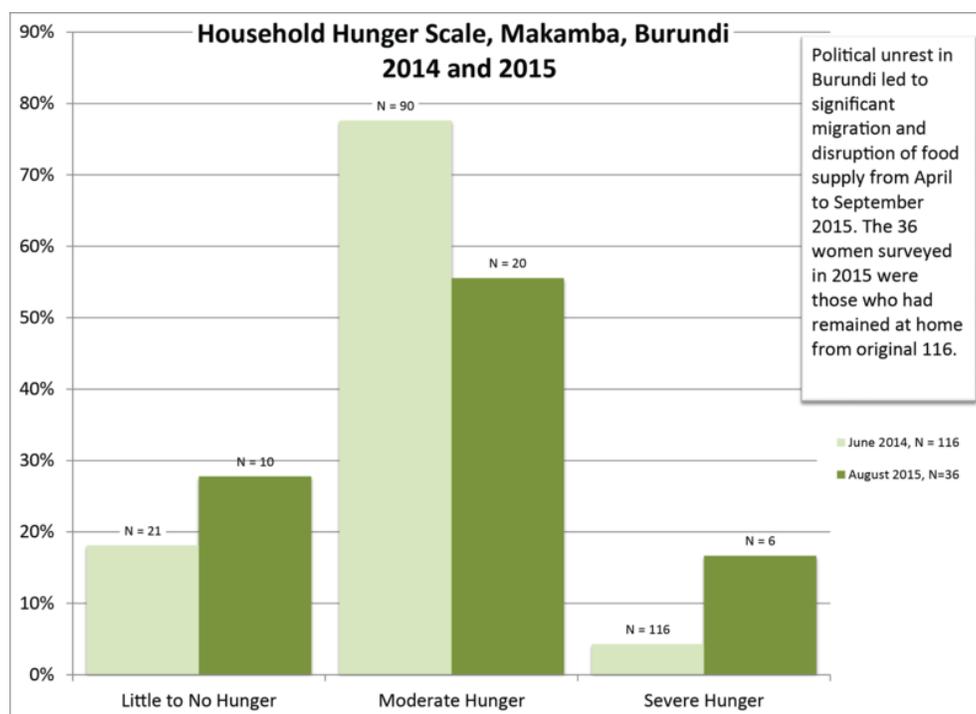
A baseline survey was conducted in June 2014 following a recent harvest, with 116 women who live in the area of original kitchen garden introduction. Results illustrated the food security situation in the region: 82% of surveyed households experienced moderate to severe hunger. In the recall period of 30 days, 105 families had at least one household member go to sleep hungry because there was not enough food.

The Women's Diet Diversity Score baseline showed 42% of women consuming a diet of "low diversity" and 54% a diet of "medium diversity," with particularly low levels of animal-based vitamin A sources. Approximately 79% of children consumed a diet below the minimum dietary diversity requirement of four food groups.

A follow-up survey in the same area was scheduled for around June 2015, so that families could be questioned during the same season as previously. However, due to the unrest, a full follow-up survey was not possible. Instead, a small sampling of 36 women was conducted in August 2015. The results were impacted not only by the unrest, but also by the fact that August is further into the dry season and availability of food was therefore decreasing.

Results showed that 72% of the 36 surveyed families experienced moderate or

severe hunger, with severe hunger increasing from 4% to 17% (Fig. 5). Of the 36, 92% had consumed a low diversity diet the day before, and only 8% achieved medium diversity.



**Figure 5.** Levels of household hunger in the area of original kitchen garden activities, in June 2014, and August 2015 (partial survey).

So - these results clearly do not show an improvement! However, this was not surprising considering the huge disruptions in the region. We will need to do another follow-up HHS and WDDS/IDDS in 2016, and future years, to see how the families are progressing. The program team can also survey families in the same region, who have not built or used a garden, to compare food security and diet between the two groups.

## Conclusion

The kitchen garden technique has been widely adopted by rural women in Burundi, giving a much-needed source of vegetables at the household level. Good practices in dissemination, construction and maintenance are actively being gathered and documented by PEAB, IARD and Episcopal Relief & Development. In particular, as women innovate on original design specifications, we are working to keep track of all their ideas. Recommendations for key features such as size of composting basket, seed spacing, watering and appropriate varieties for the garden are being established.

A sustainable seed supply is crucial for success. Families are being supported to save some seed from season to season, but as kitchen gardens spread, demand for quality seed is already being identified as a constraint. PEAB is in conversation with

the national agricultural research institute, the Ministry of Agriculture, and the World Vegetable Center in Tanzania, to brainstorm ways of increasing the availability of quality vegetable seed in the country. A locally managed “Quality Declared Seed” system could also improve access and give the communities more control over chosen seed varieties.

Improvements in vegetable disease management are also needed going forward, and the program is looking at promotion of locally adaptable natural insecticides. Mulching and other techniques are also being advised to increase water retention.

Long-term success is also highly contingent on political stability, both in terms of government support for seed supply and/or testing, and also for family food production and stability. While PEAB’s local facilitators continue to work with and be available to women in the various rural dioceses of the country, the PEAB head office has not been able to do the normal level of monitoring from late 2015 to the present, and we therefore don’t currently know as accurately if gardens are being maintained, expanded, or abandoned.

If we are able to continue measuring the impact of both women gardeners and “control groups” in the same areas, the findings could provide helpful insight into the role of the Anglican Church of Burundi’s programming, and the kitchen gardens in particular, in helping families to cope with the effects of political instability and conflict.

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