



INFO-BRIEF

IMPROVING NUTRITION IN TSHOPO PROVINCE, DRC

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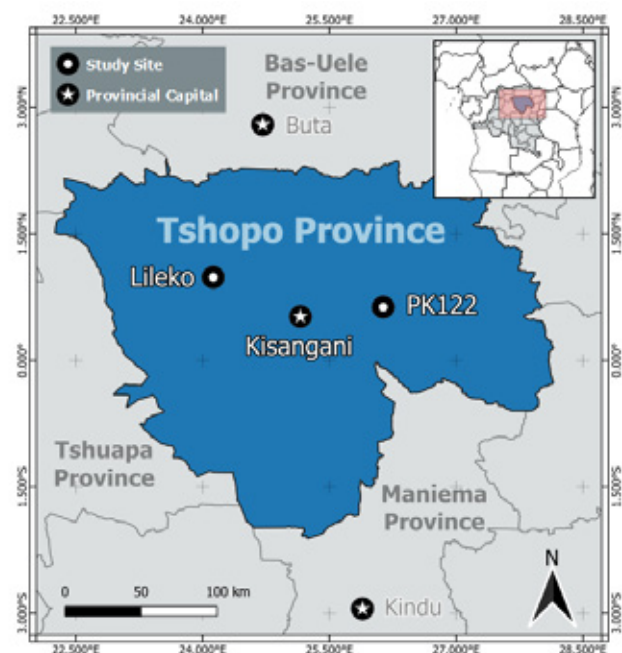
Background

Malnutrition rates in the Democratic Republic of Congo (DRC) have been amongst the highest in the world for the last few decades and do not appear to be improving. Tshopo Province located in eastern DRC is rich in natural resources including forests and two of the country's largest rivers the Congo and Tshopo Rivers. Despite these resources, evidence suggests that people living in the province experience food insecurity and malnutrition. The most recent survey shows that 41.8% of children under five in the province suffer from chronic malnutrition (stunting), 6.5% experience acute malnutrition (wasting) and 23.1% are underweight for their age (NIS 2019)¹. These figures are close to the national averages for DRC.

As part of the *Governing Multifunctional Landscapes (GML)* project, the Center for International Forestry Research (CIFOR) in partnership with the University of Kisangani, carried out a study in 2018-2019 in two sites in Tshopo province – Lileko and Bafwaboli – to try to understand why communities living close to forests and along rivers could be so affected by malnutrition and how to create conditions for improving their nutrition and health.

Lileko is situated along the Congo River and about 160 Km northwest of Kisangani (the provincial capital); Bafwaboli (PK122) is about 120 km to the northeast of Kisangani and is near the Tshopo River. The project team surveyed female caregivers of children between the ages of one and five years of age in both sites in the rainy and dry seasons in December 2018 and May 2019 for Bafwaboli (PK122), and February 2019 and June 2019 for Lileko. The survey included a 24-hour quantitative dietary recall of foods consumed by the female caregiver and her oldest child under five, a seven-day household food frequency questionnaire as well as a range of socio-demographic questions. In addition, anthropometric data for the women and children were collected and a parasitological analysis of about 300 children's stools was carried out in both rainy and dry seasons.

Figure 1. Map of DRC showing Tshopo province in blue and the two sites in which the project was carried out

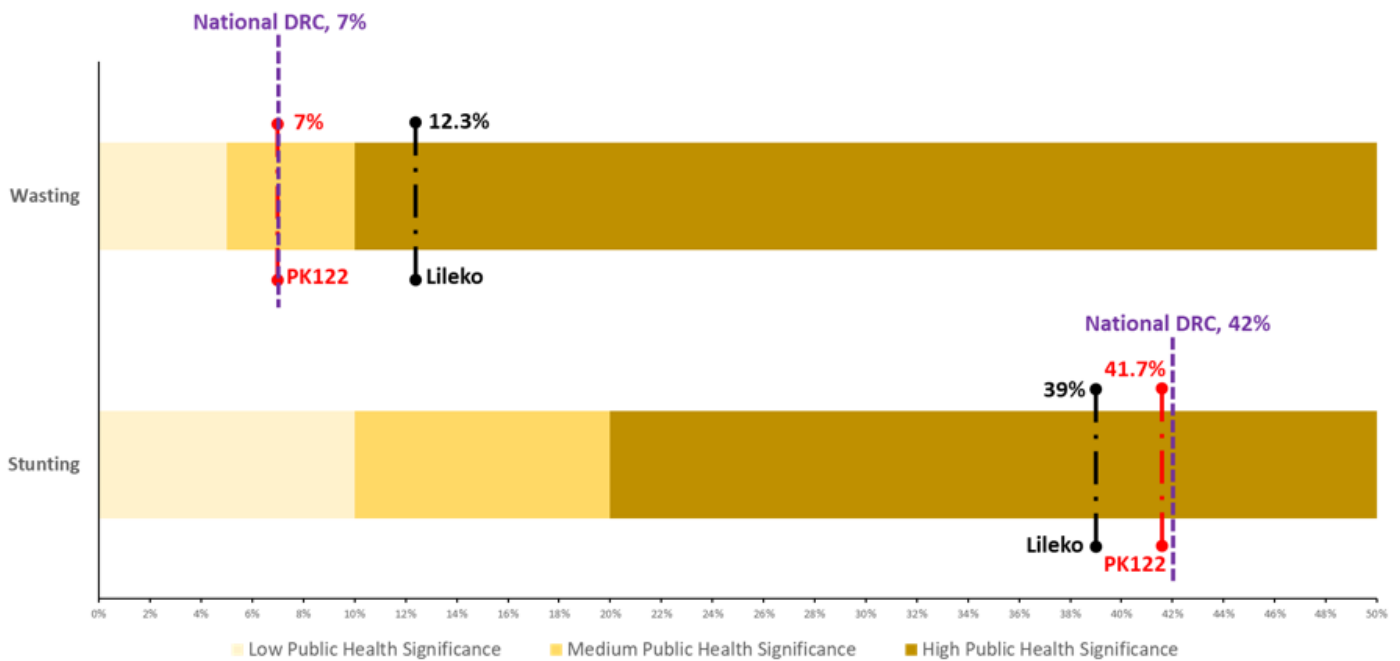


¹ [NIS] National Institute of Statistics. 2019. Multiple indicator cluster survey (MICS) 2017-2018, survey results report. Kinshasa, Democratic Republic of the Congo. Retrieved from <https://www.unicef.org/drcngo/media/3646/file/COD-MICS-Palu-2018.pdf>

Main results

Malnutrition in children under five was high in both research sites with stunting rates similar to the provincial and national averages (41.7 for Lileko and 39% in Bafwaboli) and very high wasting rates (12.3% for Lileko and 7% in Bafwaboli).

Figure 2: Malnutrition in the Project Sites compared to National Average



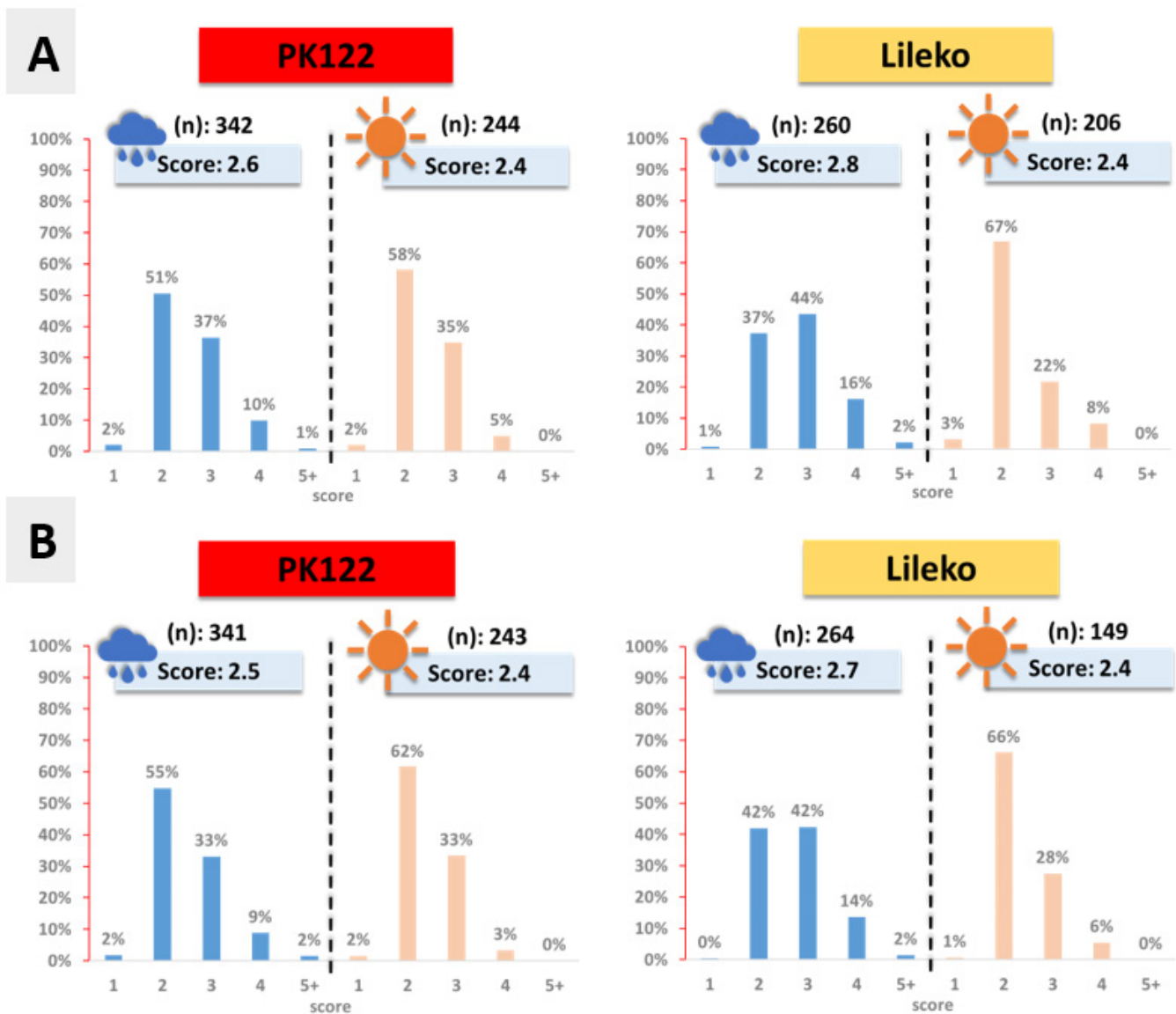
Hardly any of the women or children drank potable water; 94% drank water from rivers, streams, and ponds. Although 97% of the women reported washing hands before eating in both sites, 42% (Bafwaboli) and 50% (Lileko) did not wash hands before handling food, while 75% (Bafwaboli) and 73% (Lileko) did not wash hands after using the toilet. Perhaps as a consequence of these poor WASH practices, intestinal parasite infection was extremely high with 73.5% of children infected with at least one parasite in the dry season and 82.6% infected in the rainy season.

The four most common parasites were: *Strongyloides stercoralis*, *Entamoeba histolytica*, *Ascaris lumbricoides*, and *Ancylostoma* sp. There was also a very high rate of mixed infections with 48.4% of children found to have infections of two parasites and 28% infected with three parasites in the rainy season.

Dietary diversity was quite low for both children and women. The FAO recommends that women eat from at least five of ten different food groups per day and the WHO recommends that children eat from at least four of seven food groups. Only 11% (5%) of children in Bafwaboli and 18% (8%) in Lileko ate from the minimum recommended food groups in the rainy (dry) seasons.

The results are even worse for women with only 2% of women both in Bafwaboli and Lileko eating from the minimum recommended food groups in the rainy season. None of women in either site ate the minimum five food groups a day in the dry season.

Figure 3: Dietary Diversity scores and number of food groups consumed for children under five (A) and women (B) in both study sites



Pilot interventions

The results from the survey showed that there was a need to improve food security, to diversify diets, to enable communities to have access to clean water, and to improve WASH practices.

To address these complex and interrelated challenges, CIFOR in partnership with a national NGO - "Entraide Multisectorielle pour la Survie et le Développement" (EMSuDe-RDC) - carried out pilot interventions in 2020-2022 in the Lileko site.

The project recruited 50 men and women, who volunteered to participate in the pilot project. They were divided into five groups of 10 members corresponding to the five quarters of the village of Lileko. Each group elected a group leader who participated in the planning discussions with the EMSuDe team along with the village chief before each meeting with all of the members.

All of the groups met with the EMSuDe intervention team on a regular basis, in monthly sessions; discussions focused on different topics that were related to the intervention axes that were selected based on the survey results.

The pilot project worked on three intervention axes including:

- 1. Nutrition:** Monthly nutrition sessions, including cooking demonstrations of new recipes using locally produced foods, discussions on breastfeeding practices, and on diversifying staple food and overall food consumption as well as discussions on reducing risks of infection.

Figure 4: Recipes introduced to pilot groups

| Mixed Porridge | | Soy Walibilau | | Rice + Soybean | | Soybean Fish Stew | | Soy Vegetable Sauce | |
|---|-------------|--|-----------|---|------------|---|-------------|---------------------------------------|-------------|
| Maize flour + Soya flour + Fish powder + Palm oil | | Rice + Soybean flour + Palm oil + Vegetables | | Rice + Soybean grains + Palm oil + Vegetables | | Soybean grains + Palm oil + Vegetables + Fish | | Soybean flour + Palm oil + Vegetables | |
| Ingredients | Quantity | Ingredients | Quantity | Ingredients | Quantity | Ingredients | Quantity | Ingredients | Quantity |
| Maize flour | 1.5 kg | Rice | 45 g | Rice | 45 g | Soybean | 1 kg | Soybean flour | 0.5 kg |
| Soya flour | 0.2 kg | Soybean flour | 15 g | Soybean | 15 g | Fish | 0.74 kg | Eru | 0.4 kg |
| Fish powder | 0.15 kg | Red palm oil | 5 g | Red palm oil | 5 g | Tomato | 0.31 kg | Spinach | 0.4 kg |
| Red palm oil | 0.135 kg | Tomato | -* | Tomato | -* | Red palm oil | 0.27 kg | Tomato | 0.31 kg |
| Sugar | 50 g | Onion | -* | Onion | -* | Onion | 60 g | Red palm oil | 0.27 kg |
| Salt | 2 g | | | | | Garlic | 20 g | Onion | 60 g |
| Water | 5000 ml | | | | | | | Garlic | 20 g |
| Any vegetable | -* | | | | | | | | |
| Total weight | 7 kg | Total weight | 65 g | Total weight | 65 g | Total weight | 2.4 kg | Total weight | 1.96 kg |
| Total energy | 7693 Kcal | Total energy | 260 Kcal | Total energy | 250 Kcal | Total energy | 6681 Kcal | Total energy | 4863 Kcal |
| Total serving size/264 Kcal | 29 portions | Total serving size/264 Kcal | 1 portion | Total serving size/264 Kcal | ~1 portion | Total serving size/264 Kcal | 25 portions | Total serving size/264 Kcal | 18 portions |

*the amount is not defined. Can be added per the respondent's preference

2. **Food security:** Distribution of seeds chosen by the groups (soybean, maize, groundnuts, eggplant and tomato) and seedlings (papaya, avocado). The members were encouraged to create kitchen gardens around their homes and established a community garden in each of the five quarters. An agronomist was recruited to guide the members in this activity, demonstrating agricultural techniques including how to create and use compost.
3. **Water, Hygiene and Sanitation:** Two water pumps were installed in order to provide potable drinking water to the population. The project also distributed 50 hand-washing stations (tippy-taps) with the members contributing 20% of the costs.

The project team noted that although people in the area grew maize, almost all of it was sold, while most people rarely ate staple foods other than cassava. In addition, one of the demonstrated recipes that was particularly important as complementary food for young children made up of maize and soy flours, was not prepared by most of the members. During the course of the discussions, the group members explained that they did not consume their maize and could not prepare the porridge because they did not have a way to grind their maize or soybeans. The project agreed to purchase two mills for the community to be managed by community members; this included setting prices for customers; recording sales, saving the funds earned, and using these savings to pay for repairs.



Pilot group members sharing a meal together

Photo by Joseph Nsapu/CIFOR

Most of the group members were very motivated and participated in the project activities enthusiastically. The monthly sessions consisted of presentations by the EMSuDe team to improve knowledge and practices, experience sharing between group members, and demonstrations of culinary, health or agricultural practices. Each session ended with a shared meal.



Woman using grinding mill purchased by the project to grind maize

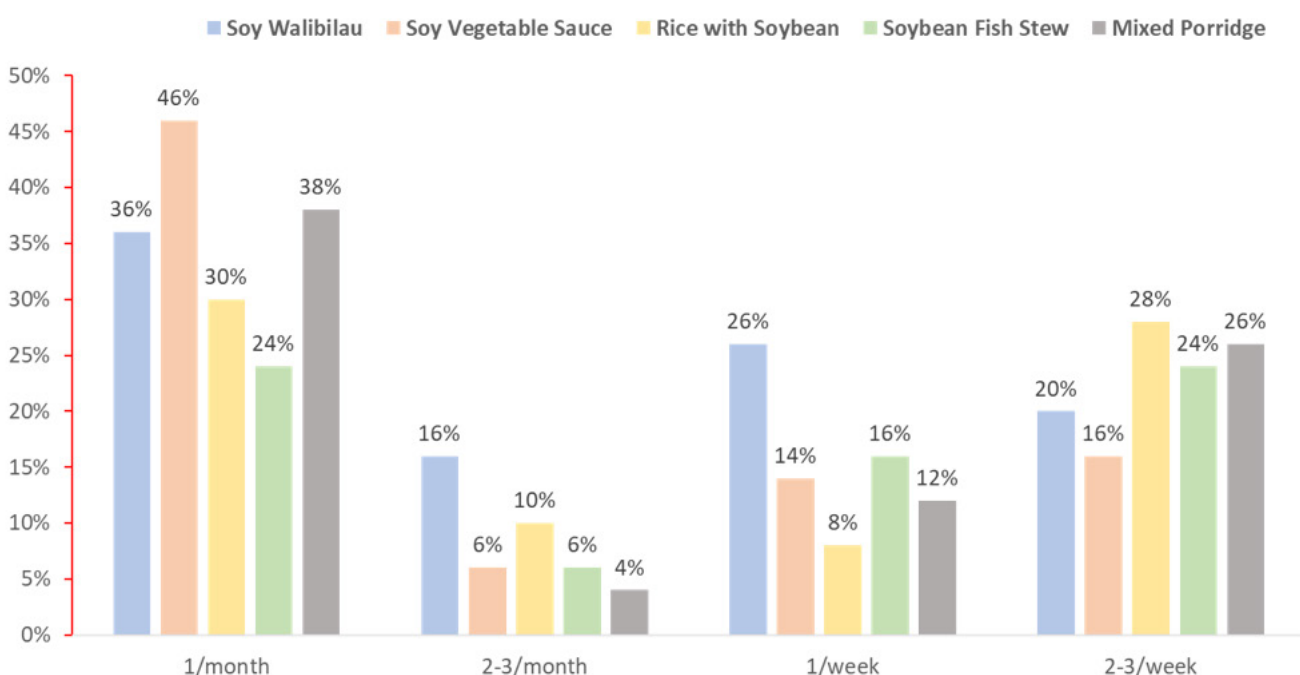
Photo by Fiston Wsanaga/CIFOR

Main results from pilot project interventions

At the end of the pilot project, an endline survey was carried out and the results were compared to the baseline survey results. Below are some of the key findings:

- The introduced recipes were well adopted by the group members who integrated them in their dietary practices. Each of the five recipes was adopted by some of the members, with the adoption proportion per recipe varying from 70% (for soybean fish stew) to 98% (for Soy Walibilau). Figure 5 shows the frequency of consumption for each recipe at the end of the project. Given how long it can take to change peoples' dietary habits, we saw quite a fast response.
- At least 20% of the foods (soybeans, vegetables, fruits) harvested were shared with non-members, which positively exposed non-members to the activities of the pilot project;
- The dietary diversity score improved from 2.6 in the baseline to 3.0 for the endline survey; This is still quite low, but showed improvement over this short period of time.
- 98% of the pilot group members used the mills to grind their maize, implying that more grains were used for feeding families and less for selling as was the case before
- 76% of the members consumed potable water from boreholes (less than 4% consumed potable water before the project)
- Likely due to the access to potable water, 98% of group members reported declines in intestinal worms and 90% reported declines in the incidence of diarrhea.

Figure 5: Times per month group members prepared the introduced recipes



Conclusions and recommendations



A child is washing his hands using the provided hand-wash station (tippy-taps)

Photo by Fiston Wsanaga/CIFOR

Chronic malnutrition can result from both poor diets as well as infection. The two can also interact with poor diets affecting immunity and susceptibility to infection and infections causing weak appetite and affecting absorption of nutrients. The pilot interventions of the GML project targeted both the immediate causes of chronic malnutrition by providing access to clean water to reduce infection and by sharing information about healthy diets and promoting consumption of nutrient-rich available foods through new recipes. The project also worked to address some of the underlying causes of malnutrition by working in partnership with the group members to improve hygienic practices and to promote the cultivation of crops that were not widely cultivated in the community.

The interventions trialed by the project were not all immediately successful and sometimes required adjustment. For example, the yields from the first soybean harvest were not very high; the project

team therefore invited an agronomist to instruct the communities on how to make and use compost, which was not done before. This led to an improvement in yields in the second harvest. The collaborative approach used by EMSuDe-RDC with the group members meant that the group members often suggested solutions to the problems as they arose in an iterative process. For example, when it became apparent that people were not using the new recipes for mixed porridge although it was well liked by the children, they suggested that having access to a mill would enable them to grind the maize and soybeans necessary to prepare the recipe instead of having to purchase the ground flours. The project was able to procure two mills, which are managed by the groups, who have set fees to cover costs of maintenance. This has enabled community members to use the maize that they grow for their families' consumption and not just for sale.

Changing dietary practices often takes time as people's palates and daily practices adjust to eating new foods or foods prepared in new ways. The successful adoption rates of the nutrient-rich recipes introduced by the project is a very promising start to healthier diets as is the interest shown by other community members in growing the soybeans promoted by the project. The cultivation of soybeans has expanded beyond the pilot groups as members have shared seeds with interested neighbors. While this is happening organically in the community, since the initial group was so small, this process could be expedited with very little increased support. We recommend:

- 1. Educating stakeholders that poor nutrition is not only a result of poor diets, but also of infection.** Thus sources of infection need to be addressed, especially access to clean drinking water. And education in basic WASH practices is also important at the individual level.
- 2. Promotion of soybean and groundnut production and consumption.** Although animal source foods are highly recommended as nutrient-rich sources of bio-available nutrients, plant based leguminous foods are also important sources of protein and minerals. While animal source foods are still very important, due to overhunting and overfishing, these foods have become less available. Thus soybeans and groundnuts can help to provide some of these important nutrients to fill in the 'gap'. At the same time, because they are leguminous crops, they can also help to enrich the soils over time and to make other crops more productive.
- 3. Installation of equipment** to enable community members to process foods such as maize, which are already being grown, but are not being used optimally due to difficulties with processing.
- 4. Promotion of dietary and staple food diversity using local foods as much as possible, but also introduction of new foods that can be grown locally.** Such foods need to be tried by community members and discussions need to be held to ensure that they are desired. Only if the members are interested should they be introduced. In the areas where we have carried out our project, current local dietary patterns are not sufficient to enable people to meet recommended daily intakes for some nutrients, thus new foods and new recipes are critical in improving nutrition.
- 5. To extend the activities of this pilot project to more community members and to a larger area.** Expanding to a health administrative area with government baseline data on malnutrition would allow for a rigorous evaluation of intervention impacts on malnutrition that could be then used for advocacy of incorporating such activities into wider programming.

