



STRENGTHENING COMMUNITY BASED MANAGEMENT OF ACUTE MALNUTRITION AND FOOD SECURITY IN TWO REGION OF MALI: KOULIKORO AND SIKASSO

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FINAL REPORT

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INTRODUCTION

In response to the ongoing food and humanitarian crises in Mali, HKI was granted OFDA support to target the nutrition and food security sectors, integrating the prevention and treatment of acute malnutrition with an adaptation of its enhanced homestead food production (EHFP) program. The project targets the Nara, Koulikoro, Fana, Dioila, Kolokani, Banamba districts of Koulikoro region, and the Koutiala, Sikasso, Bougouni, Kolondieba, Kignan districts of Sikasso region, where undernutrition and food insecurity are most acute according to recent assessments. The 2011 SMART survey found a global acute malnutrition (GAM) rate of 12.4 percent in Koulikoro, and 6.5 percent in Sikasso, while underweight among women of reproductive age was 14.4% in Koulikoro and 16% in Sikasso. Micronutrient deficiencies were also serious, with more than 70 percent of children 6-59 months and more than half of women of reproductive age suffering from anemia (MICS 2010).



By increasing and diversifying household food production through EHFP in combination with reinforcing health sector and community capacity for the community-based management of acute malnutrition (CMAM) and integrating within both platforms the Essential Nutrition Actions (ENA) approach to promoting optimal nutrition practices, the program aimed to contribute to reducing undernutrition and improving food security. A total of 216 community health centers (CSCOM) across the 11 targeted health districts were supported by the project, and community-level activities were carried out in 467 villages.

The nutrition sector activities of the project began in October 2012 and the food security sector activities in April 2013. A no-cost extension (NCE) extended the end date for an additional six months to April 30, 2014. The program objective for the nutrition sector was to strengthen community-based detection, referral and follow up of acute malnutrition in Mali and the objective under the food security sector was

to increase the number of women producing nutrient rich plant and animal-source foods and ensuring the most nutritionally vulnerable household members consumed these products. The program also assisted women to sell surplus production in nearby markets to enhance household income and resilience.

Table 1: Sector and Subsector Indicator Table for (A) Koulikoro and (B) Sikasso Regions

A. Koulikoro Region					
Sector: Nutrition					
Geographic Area(s): Nara, Koulikoro, Fana, Dioila, Kolokani, Banamba districts			Reached during the reporting period		
Sub-Sector:	Management of Moderate Acute Malnutrition (MAM)	Target	Y1	NCE	Total
Indicator (1)	Number of sites managing MAM	105	116	118	118
Indicator (2)	Number of beneficiaries treated for MAM ¹ < 5s male (M) <5s female (F)	22,137	M=3,480 F=5,420	M=2,822 F=4,532	M=6,302 F=9,952 All=16,254
Indicator (3)	Number of health care providers and volunteers trained in the prevention and management of MAM	1,233	M=280 F= 518	0	M=280 F= 518 798 ²
Indicator (4)	Recovery rate among children treated	>75%	85%	86.3%	85.9%
Indicator (5)	Default rate among children treated	< 15%	15%	13.4%	13.2%
Indicator (6)	Death rate among children treated	< 5%	0%	0.3%	0.9%
Indicator (7)	Strengthened formative supervision systems in place: - # of supervision visits of health facilities with onsite training carried out - # of supervision visits of communities carried out	72 480	214 448	62 273	276 721
Sub-Sector:	Management of Severe Acute Malnutrition (SAM)	Target	Y1	NCE	Total
Indicator (1)	Number of health care providers and volunteers trained in the prevention and management of SAM	1,205	M=280 F= 518	0	M=280 F= 518 Total: 798 ²
Indicator (2)	Number of sites established/rehabilitated for inpatient / outpatient care	6 / 105	NA	NA	NA
Indicator (3)	Number of children treated for SAM ¹ - <5s inpatient care with complications - <5s outpatient care without complications	812 4,601	M=294 F=307 M=3,463 F=4,121	M=229 F=223 M=2001 F=2459	M=523 F=530 All=1,053 M=5,464 F=6,580 All=12,044
Indicator (4)	Recovery rate among children treated for acute malnutrition in target zones	>75%	90%	89.8%	89.9%
Indicator (5)	Default rate among children treated for acute malnutrition in target zones	< 15%	9%	9.1%	9.1%
Indicator (6)	Death rate among children treated for acute malnutrition in target zones	< 10%	1%	1.1%	1%

¹ Adults are not treated in Mali's programs. Our quarterly mass screening strategy has been highly effective in identifying and referring cases of SAM, thus cases have greatly exceeded our targets.

² UNICEF training covered others health staff.

(cont.) Indicator Table - Nutrition Sector - Koulikoro Region					
Sub-Sector:	Nutrition Education and Behavior Change	Target	Y1	NCE	Total
Indicator (1)	Beneficiaries (caretakers of children treated) receiving nutrition education through inter-personal communications	27,550	23,969	13,775	37,744
Indicator (3)	Number of providers (health care and/or community volunteers) trained in provision of nutrition Education				
	- # of health center-based care providers	333	234	0	234
	- # of community resource persons	900	539	0	539
Indicator (4)	Number of communities conducting regular screening for malnutrition	105	294	216	294
Indicator (2)	Knowledge of mothers of children <24 mos.	Target	Baseline	Endline (K)	Endline (S)
	Correct age for introduction of complementary foods (at 6 mos)	80%	66%	85%	84%
	Knowledge of timely initiation of breastfeeding (within first hour of birth)	N/A	55%	85%	88%
	Sick child should be fed more	N/A	72%	80%	82%
	Unable to identify food rich in iron	N/A	42%	2%	7%
Subsector: Seed Systems and Agricultural Inputs					
Sector: Agriculture and Food Security		Dollar Amount Requested: \$239,815			
Geographic Area(s) Fana, Koulikoro and Dioila districts					
Indicator	Number of direct beneficiaries (each with average HH size of 7)	Target	Y1	NCE	Total
		150	150	150	150
Indicator (1)	Number of people receiving training and inputs for homestead food production:				
	- Number of women benefitting from nutrition training	150	150	150	150
	- Number of women benefitting from livestock activities	150	150	155	155
	- Number of women benefitting from seed systems/agricultural input activities	150	150	155	155
Indicator (2)	Projected increase in months of food self-sufficiency ³ due to project support	+4	N/A	+6	+6
Indicator (3)	Number of women implementing a garden at the homestead	150	75	153	228
Indicator (4)	Number of supervisions conducted by HKI to monitor activities in the demonstration and home gardens	72	48	48	112

³ It is more accurate to define this indicator as additional months of homestead food production. Vegetable production was extended two growing seasons over the dry period and poultry production is now year round.

B. Sikasso Region					
Sector: Nutrition					
Geographic Area(s): Koutiala, Sikasso, Bougouni, Kolondieba, Kignan districts					
Sub-Sector:	Management of Moderate Acute Malnutrition (MAM)	Target	Year 1	NCE	Total
Indicator (1)	Number of sites managing MAM	163	160	161	161
Indicator (2)	Number of beneficiaries treated for MAM < 5s male (M) < 5s female (F)	14,043	M=5,310 F=13,459	M= 5,226 F=8,136	M= 10,536 F=21,595 All=32,131
Indicator (3)	Number of health care providers and volunteers trained in the prevention and management of MAM ⁴	2,475	M=362 F= 845	0	M=362 F= 845 All=1,207
Indicator (4)	Recovery rate among children treated	>75%	83%	92%	89%
Indicator (5)	Default rate among children treated	< 15%	17%	8.4%	11%
Indicator (6)	Death rate among children treated	< 5%	0%	0%	0%
Indicator (7)	Strengthened formative supervision systems in place: - # of supervision visits of health facilities with onsite training carried out - # of supervision visits of communities carried out	326 652	366 566	290 442	656 1008
Sub-Sector:	Management of Severe Acute Malnutrition (SAM)	Target	Year 1	NCE	Total
Indicator (1)	Number of health care providers and volunteers trained in the prevention and management of SAM	2,475	M=362 F= 845	0	M=362 F= 845 All=1,207
Indicator (2)	Number of sites established/rehabilitated for inpatient / outpatient care	6 /163	NA	NA	NA
Indicator (3)	Number of beneficiaries treated for SAM ⁵ - <5s inpatient care with complications - <5s outpatient care without complications	552 3,125	M=1,697 F=16,80 M=3,839 F=4,362	M= 1249 F= 1423 M= 3308 F=3809	M=2,946 F=3,103 All=6,049 M=7,147 F=8,171 All=15,318
Indicator (4)	Recovery rate among children treated for acute malnutrition in target zones	>75%	82%	87%	83.3%
Indicator (5)	Default rate among children treated for acute malnutrition in target zones	< 15%	15%	10.2%	12%
Indicator (6)	Death rate among children treated for acute malnutrition in target zones	< 10%	3%	2.8%	3%

⁴ UNICEF training reached other health staff.

⁵ See note 1.

(cont.) Indicator Table – Nutrition Sector - Sikasso Region					
Sub-Sector:	Nutrition Education and Behavior Change	Target	Year 1	NCE	Total
Indicator (1)	Beneficiaries (caretakers of children treated) receiving nutrition education through inter-personal communications	17,720	15,904	16,790	32,694
Indicator (3)	Number of providers (health care and/or community volunteers) trained in provision of nutrition Education	519	439	0	439
	- # of health center-based care providers	1956	768	0	768
	- # of community resource persons				
Indicator (4)	Number of communities conducting regular screening for malnutrition	163	173	173	173
Indicator (2)	Percent change among mothers of children < 24 months of age who know the correct age for introduction of complementary foods	Revised Target		Baseline	Endline
		80%		60%	83.6%
Sector: Agriculture and Food Security		Dollar Amount Requested: \$266,468			
Subsector: Seed Systems and Agricultural Inputs					
Geographic Area(s) Kignan, Sikasso, and Koutiala districts		Target	Y1	NCE	Total
Indicator (1)	Number of direct beneficiaries (each with average HH size of 7)	200	200	200	200
Indicator (2)	Number of people receiving training and inputs for homestead food production:				
	- Number of women benefitting from nutrition training	200	200	200	200
	- Number of women benefitting from livestock activities	200	200	200	200
	- Number of women benefitting from seed systems/agricultural input activities	200	200	200	200
Indicator (3)	Projected increase in months of food self-sufficiency ⁶ due to project support	+4	N/A	+6	+6
Indicator (4)	Number of women implementing a garden at the homestead	200	145	185	330
Indicator (5)	Number of supervisions conducted by HKI to monitor activities in the demonstration and home gardens	150	75	56	163

⁶ See note 3.

I. Program Management

The project team was led by a Project Coordinator assisted by a Food Security Coordinator and a Nutrition Coordinator. They oversaw a team of six food security supervisors, seven nutrition supervisors and 15 nutrition field workers. The team worked in close cooperation with the respective regional health directors and their health agents, as well as agriculture and animal husbandry technical staff. In Koulikoro each field agent supervised activities in 16 villages and in Sikasso each field agents supervised 12 villages.

Table 2: Distribution of health centers (CSCoM)

Region	Health district	No. CSCoM
KOULIKORO	Koulikoro	17
	Banamba	18
	Dioila	19
	Fana	17
	Nara	20
	Kolokani	20
	Total	111
SIKASSO	Koutiala	41
	Sikasso	52
	Kignan	9
	Kolondièba	18
	Bougouni	35
	Total	155
GRAND TOTAL	11	266

The health sector activities covered a total of 111 community health centers (CSCoM) in 6 health districts of the Koulikoro region and 155 CSCoM in 5 health districts of Sikasso. Nutrition behavior change and screening activities were implemented by 294 mothers groups across 96 villages in Koulikoro and 173 mothers groups across 120 villages by in Sikasso

The food security strategy was a pilot effort to assess the adaptability of HKI's Enhanced Homestead Food Production model to an emergency setting, therefore it was limited to six communities; three in each region. In Koulikoro the EHFP sites (indicated with blue highlights in Table

2) were located in Fana, Koulikoro and Dioila districts and in Sikasso Region, Kignan, Sikasso, and Koutiala districts. The village names and locations are given in Table 3 and indicated with green stars on Figures 1 and 2 below. The HFP villages also conducted screening and ENA activities, and these two strategies targeted the same beneficiary mothers.

The project team held monthly meetings in Bamako to bring together all field supervisors, nutrition agents and food security agents to review achievements, share learning, discuss challenges and seek solutions, and plan activities for the next month.

Table 3 : EHFP villages

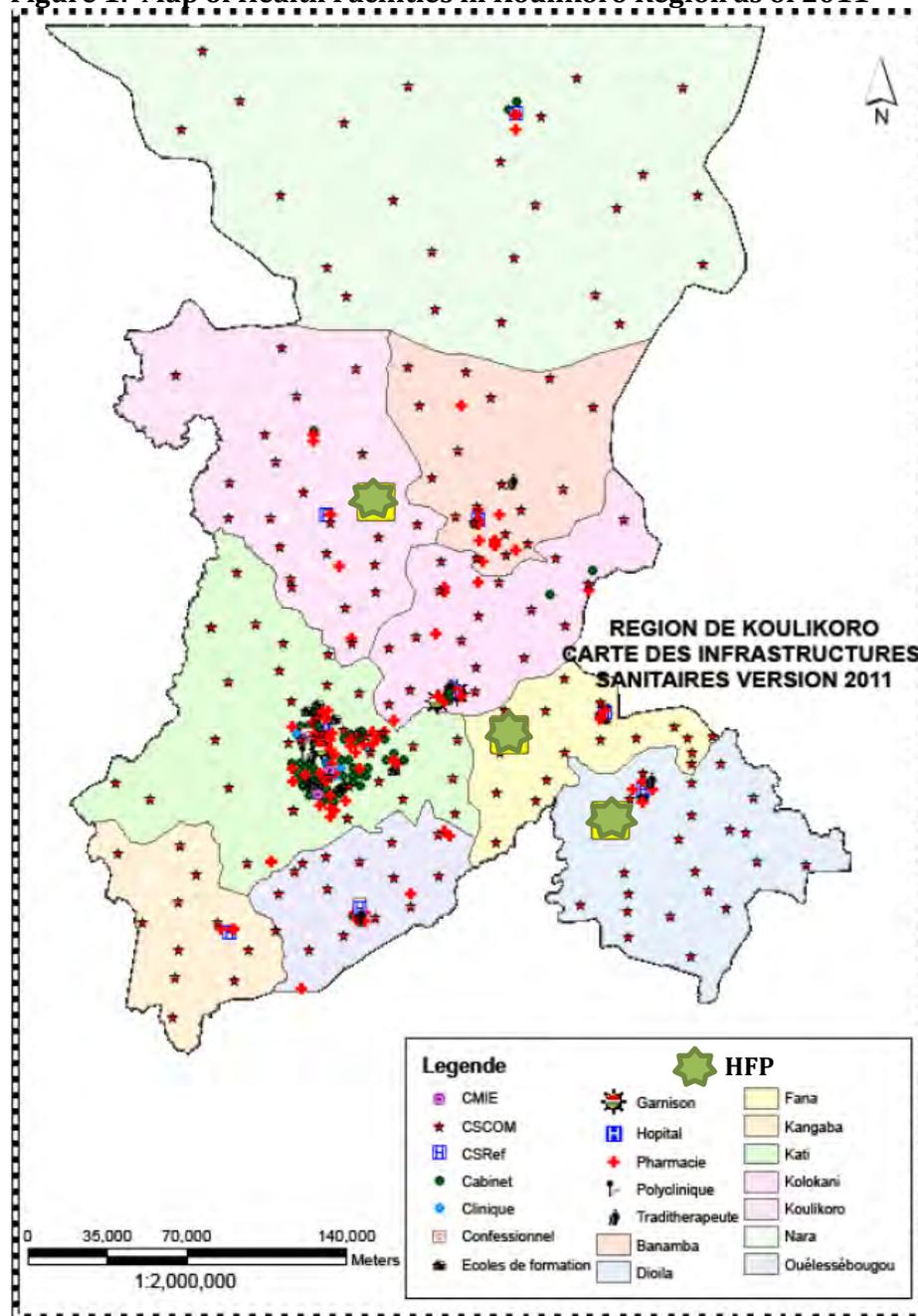
Region	Target Village	Commune	Location
KOULIKORO	Sirakorola	Sirakorola	55 km from Koulikoro
	Tingolé	Binko	25 km from Fana
	N'Golobougou	N'Golobougou	55 km from Dioila
SIKASSO	Bankorobougou	Finkolo Ganadougou	96 km from Sikasso
	Zeina	Fagui	45 km from Koutiala
	Kignan	Kignan	75 km from Sikasso

II. Program Coordination

The HKI Project Coordinator was an active participant in the Nutrition Cluster meetings organized by UNICEF to allow all partners to share information about their zones of intervention and project strategies to avoid duplication and harmonize approaches. The Coordinator also attended a Cluster training provided by UNICEF. At one of the meetings, HKI shared the project strategy with other

NGOs including included *Action Contre la Faim*, *Save the Children*, *Catholic Relief Services*, *Islamic Relief*, and *Mouvement pour la Paix et le Développement*.

Figure 1: Map of Health Facilities in Koulikoro Region as of 2011

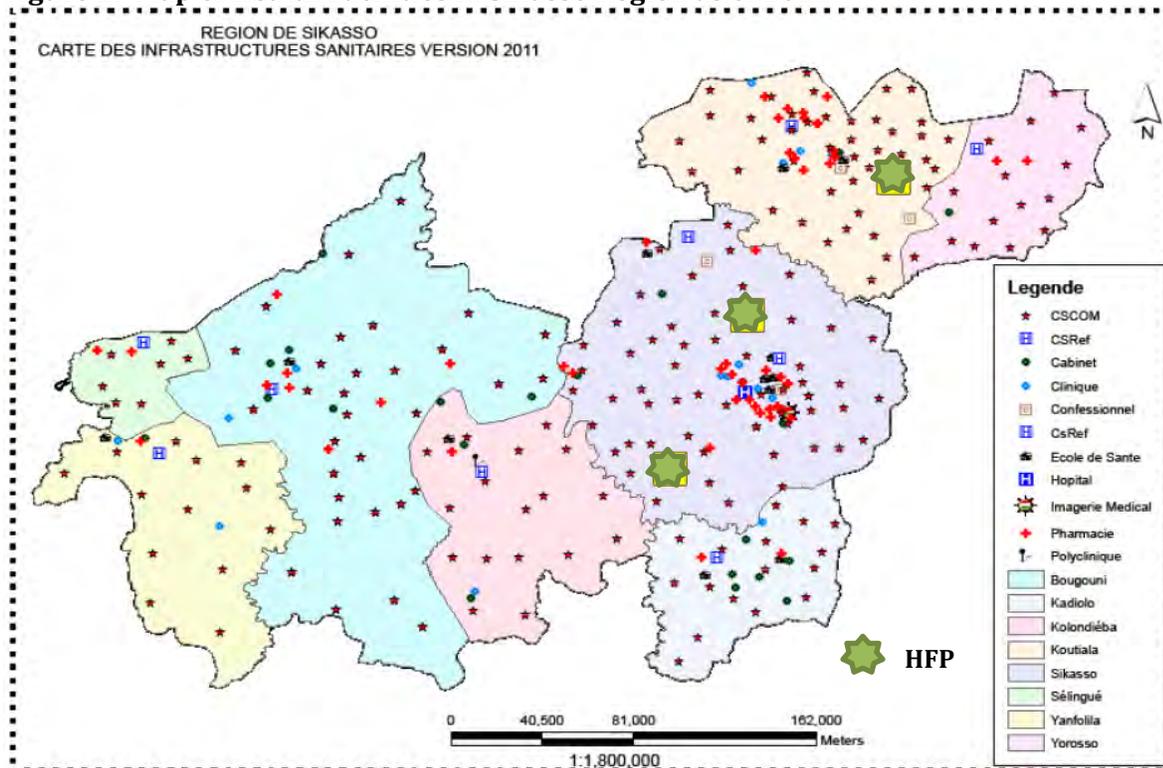


The project also worked in partnership with the Regional Health Directorate and District Health Offices to deliver all training (in how to implement the national CMAM protocol and in the Essential Nutrition Actions framework⁷) and to conduct quarterly joint (project-government) supervisory

⁷ ENA encompasses women's nutrition, infant and young child nutrition (MIYCN), the key micronutrients vitamin A, iron, zinc and iodine, and the hygiene practices that are equally fundamental to nutrition and growth. It targets the first 1,000

visits. The responsible nutrition focal point in each region also made periodic supervision visits with the project team. The Homestead Food Production activities were implemented in collaboration with regional and district staff and extension agents of the ministries responsible for⁸ agriculture, livestock, rural development, and water resources and created links with private entities in veterinary medicine, well construction, seed suppliers, etc.

Figure 2: Map of Health Facilities in Sikasso Region as of 2011



At the community level, interventions began with a meeting with local authorities (village chief, mayor) followed by a general meeting with interested community members to explain the objectives of the project’s work in nutrition and food security, to specify the community participation needed, to solicit nominations for *relais communautaires* to oversee community activities and to identify target beneficiaries. For the nutrition activities these included all mothers with children under five years of age, as the Malian policy targets this age for screening and treatment for acute malnutrition.

The food production strategy built on existing community garden that had fallen into disuse, reviving them with training, proper tilling and inputs. These gardens were the property of existing women’s production groups, so these women’s households were automatically enrolled in the EHFP activities. These groups selected the peers they felt were best suited to become the master

days of life from conception through age two as well as adolescent girls, for whom nutrient requirements are increased, the risks of undernutrition are elevated, and the consequences of deficiencies life threatening. Its training programs are designed to ensure that appropriate nutrition actions are integrated into health services as well as community platforms and projects across multiple sectors (health, agriculture, microfinance, water and sanitation), in order to seize all opportunities to support and reinforce optimal practices.

⁸ The names of these ministries are continuously changing so this is preferred terminology.

trainers, or “Village Farm Leaders” (VFL). Each garden group selected four to provide ongoing technical support to other women and management oversight to keep the garden functioning. The project team encouraged each community garden group member to select a young mother for the training, so that the benefits could reach as many as possible in the ‘1,000 day window of opportunity.’

II. Training and capacity building

For the nutrition sector, multiple kinds and levels of training were delivered. The first round was for project supervisors and field agents. The Project Coordinator provided the initial nutrition training to field staff and the Food Security Coordinator provided the agriculture training to his field team.

The training of health agents in CMAM and ENA was conducted by MOH staff using the official government training programs for each, with both the participation and support of project supervisors and field agents. Because UNICEF had just provided a series of nutrition trainings in the same districts, the number of agents trained by HKI was lower than originally planned. The project staff then provided a two-day training to *relais communautaires*, together with their mothers’ groups, on techniques of screening and referral of acute malnutrition cases using MUAC measures and the themes of ENA. Health agents provided support for this training in the communities under their responsibility. The *relais* then were responsible for organizing monthly screenings, with a discussion at each meeting of a different theme of prevention (ENA, WASH) and the importance of treatment for children diagnosed with acute malnutrition; the groups were supervised and supported in these activities by the field staff. Supportive supervision visits were monthly to the CSComs to reinforce application of the practices covered in the ‘classroom’ training, and were also made monthly to support application by community groups.

Table 4: Nutrition prevention and screening activities

Region	Groups conducting monthly meetings	Number of home visits
Koulikoro	294	1,463
Sikasso	173	1,135
Total	467	2,598

HFP training was provided first to the VFL by the field supervisors, and then they worked together to train the mothers’ group members, each of whom cultivated her own (50 m²) parcel on the community garden. The

field agents came regularly to the gardens to provide technical supervision and also visited the household gardens of the women who were able to replicate production at that level. Although this required household contributions, the majority of women were motivated to do so, and production in these plots is traditionally entirely for household consumption. The nutrition training for these mothers was delivered through the nutrition sector activities, but the HFP training also emphasized the importance of household consumption of garden produce and of using income to purchase other nutrient rich foods, particularly for pregnant and lactating women and children 6-23 months. Recipes were developed and demonstrated at the gardens to encourage the inclusion of diverse products in enriched porridge and other local dishes.

The training for VFL in improved cultivation techniques was spread over the course of one week so as not to overload them with information and to accommodate their other household responsibilities. After their training, each worked with groups of 10 women members of the community garden to train them in these techniques with the support of the project field supervisor. A total of 60-70 women per village in Sikasso were direct beneficiaries and received

training, seeds, poultry and some tools (watering cans, hoes, etc.), while in almost all sites the total number trained was more than doubled (in the village of Zeina it reached 162), in response to demand.

The training used active learning methods, wherein the women immediately practiced the recommended techniques. The training modules were brief and each focused on a single theme. For example:

- How to shape the beds for planting;
- How to mix and apply an organic pesticide (plants to select; quantities of each to combine; storage; application methods and quantities) and discouraging the use of chemical pesticides which pose health risks when misapplied, which is common;
- Methods of intercropping and rotation to increase yield as well for pest management and soil conservation;
- How to create compost (ingredients, quantities, fermentation, storage);
- Appropriate spacing, planting depth and watering quantity/schedule for each seed variety;
- Techniques for the solar drying of certain plants such as okra and dark green leafy vegetables (DGLV) to preserve the nutrients and extend the period of consumption.

Table 5: Community and Home Gardens

Village	Community Gardens		Family Gardens		
	Size (ha)	No. women farmers	No. of Gardens	Size (ha)	No. women farmers
Bankorobougou	1	65	33	4.1	99
Kignan	1	65	22	2.8	66
Zeina	1	70	55	6.9	165
Tingolé	1	50	35	4.8	105
N'Golobougou	1	50	30	3.8	90
Sirakorola	1	55	11	1.4	33
Total	6	355	186	23.3	558

Training and supervision were ongoing, with the field supervisor returning frequently (daily at first; later three times per week) to observe, advise and correct techniques. Each woman with a private or family garden cultivated about 12 different crops (watermelon, eggplant, winter cabbage, dry season cabbage, melon,

hot pepper, green pepper, green beans, okra, onion, tomato, lettuce, carrots, beets, cucumber, celery and parsley). The project sought to balance the emphasis on the importance of cultivating high nutrient plants such as dark green leafy vegetables and orange fleshed sweet potatoes (OFSP) with the need for income generation. OFSP is not yet widely cultivated in Mali, but the white-fleshed variety is and therefore can offer an entree for introducing the vitamin A-rich varieties. The project team imported vines from HKI's program in Burkina, and began cultivation in the recent rainy season. They were well accepted by producers and adapted to the climactic conditions, although harvest occurred after the project end date. Women were also particularly interested in cultivating okra and local eggplant (djakatou), which are popular in local cuisine and thus highly marketable. In Sirakorola and Kignan, women favored salad and cabbage for income generation.

There are three cultivation seasons in these two regions of Mali:



- “*Hivernage*” (“winter”) or rainy season, generally from July-September, is when the staple crops are planted, but vegetables, including OFSP, are also cultivated in this period. The harvest of staples is very labor intensive and occurs generally in October and November.
- The first, or cold, “*contre-saison*,” which stretches from about December – February and is the most productive season for vegetable gardening.
- The second, or hot, “*contre-saison*,” from about March – May, and which is quite dry. Okra and string beans grow best in this season but a variety of plants can continue to perform or produce seeds.

EHFP supports production of animals as well as plants in recognition of the vital importance of animal source foods for those in the 1,000 day window. For climactic reasons, poultry production was supported in Sikasso and goats in Koulikoro. Each direct beneficiary in Sikasso received nine local breed hens and one cock of improved race and was required to provide 5 chicks (5 male and one female) to one other woman in her community within the first year to expand the project reach. Each direct beneficiary in Koulikoro received two local goats and was required to give one of the offspring of these goats to another woman in her community. Although the project ended before all the bequests could be made, mayors and village councils are ensuring their completion. The improved cocks had a very positive impact on egg production, especially when combined with improved cooping designs and feed. The improved feeds increased reproduction and the volume of milk production among the goats. Among the improved husbandry techniques reinforced were linkages with veterinarians to ensure regular vaccination, improved cleanliness, drainage and ventilation of sheds or coops, increased space per animal and reinforced roofing.

HKI procured its seed packages through AVRDC and the organization was impressed enough with the model to provide a grant to HKI for technical assistance in the applying approach to its own horticultural projects in Mali.

Direct beneficiaries received an initial package of seeds to launch the first year of production and to encourage producers to try new (improved) varieties of vegetables. To enable a sustained supply of high quality, certified seeds, project agents facilitated links between the women’s groups and reliable suppliers. (These connections were lacking before the project and community members often purchased poor quality seeds that failed in production.) By pooling their purchases, the producer groups also obtained better prices. The project also supported selected highly motivated women to become seed multipliers within their communities. The groups also pooled resources to purchase improved animal feeds in bulk.

The project also reinforced traditional practices of preservation and conservation, such as solar drying and “canning” under vacuum.

III. Mobilization, awareness and community-based activities

As noted, the 467 target villages all held monthly meetings at which children 6-59 months were screened and mothers were engaged in discussions of various themes of essential nutrition and hygiene practices. Some groups held screening and ENA discussions together; others chose to hold them on separate days. Home visits were also conducted by the *relais* to families with malnourished children to reinforce the importance of completing treatment and to counsel on preventive practices.



Table 6: Screening by community groups

Region	Total screened ⁹	MAM	Proportion	SAM	Proportion	Enrolled in treatment (SAM+MAM)
Koulikoro	57,802	3,272	17.7%	992	1.7%	2,938 (69%)
Sikasso	71,254	6,226	8.7%	1,200	1.7%	4,775 (64%)
Total	129,056	9,498		2,192		7,713

Over the course of the project these community groups conducted a total of almost 130,000 screenings with MUAC, although because these were regular activities in target villages, clearly most children were screened multiple times.

In the gardening communities, the nutrition behavior change messages gave emphasis to household consumption of garden and animal products. Because the production techniques improved yields in both areas, families were easily persuaded to eat a portion, and accepted the advice about the value of eggs and goat milk for children 6-23 months of age. Traditional myths that eggs would make children become thieves and goats milk make them gossips were easily dispelled.

There was considerable spillover of the HFP activities, with training extended by both field agents and the direct beneficiaries themselves to women beyond the direct beneficiary group. This was most common in the HFP communities but there were also a number of examples of women from neighboring villages visiting community gardens to learn from the practices demonstrated there.

IV. Monitoring & Evaluation

The data for the treatment of acute malnutrition were collected and compiled by the health information system of the Ministry of Health. Health agents at each facility filled out registers by hand of intake and each subsequent visit of children under treatment. The data were collected monthly from the health centers and transmitted to districts, then to the regional health directorates where they were put into an electronic reporting format developed by UNICEF (and validated by the nutrition partner group) for transmission to the national level. CSCOM directors are expected to ensure correct data collection, but do not always fulfill this responsibility. Although the project's supportive supervision gave emphasis to reinforcing the correct method for completing these forms, mistakes were common and the use of data for management purposes remains weak.

To assess nutrition behavior change, the project conducted a small population-based survey using EPI sampling methodologies (30 clusters, 10 households per cluster, selection probability proportional to size). The baseline sample included one set of n=300 households; n=170 (57%) in Koulikoro and n=130 (43%) in Sikasso. At endline a full 30x10 sample was drawn for each region. At baseline, 66% of women in Koulikoro knew the correct age for the introduction of complementary foods, as did 60% of mothers in Sikasso. At endline the proportions had increased to 85% and 84%, respectively. Table 1

In addition, after one year of intervention in Sikasso, a coverage assessment was conducted in the district of Koutiala (November 24 - December 8, 2013) to evaluate the quality of the CMAM program using the semi-quantitative evaluation of access and coverage (SQUEAC) methodology. The Coverage Monitoring Network (CMN) project provided technical support for the survey. The

⁹ Our data do not allow us to identify how many children were screened more than once.

MOH is persuaded of the importance of this tool, which uses routine data to improve understanding of barriers to improved coverage, thus it was also a capacity-building exercise for MOH staff, HKI and other implementing partners. The findings estimated the point coverage for SAM achieved by the program in Koutiala to be 26 % [95% CI: 18.1% - 35.3 %], which is in the range of what is expected in routine programs. The table below shows the various factors identified as barriers to accessibility and use of services and the main strategies for improving coverage in the future.

Data on village-level nutrition activities were collected and compiled by project nutrition field agents, and HFP activities by project food security field agents. These data were reviewed and discussed during the monthly project coordination meetings. Unfortunately, the food security team did not collect an exhaustive list of the number of indirect beneficiaries; i.e., those who replicated the gardening activities without material inputs but by learning from the VFL other beneficiary women working in the community gardens. Thus the data on family gardens presented in Table 5 are only partial.

Table 7: Findings of SQUEAC survey

Barriers	Recommendations	Action plan
Lack of community knowledge of acute malnutrition	Reorganize and strengthen BCC activities	-Project staff to support the district team to involve more local social development staff for sensitization on nutrition -District health team to develop a work plan to reinforce BCC activities
Insufficient screening	Increase active screening (including mass screening and during child health days) and routine screening	All CSComs were instructed to increase the number of screening days each week from 1 to 2 and continue systematic screening for each child (well/sick) seeking care at CSCOM
Weak service quality	Strengthen communication between CSCom staff and beneficiaries	Organize discussions with CSCom staff and ASACO to explore joint solutions
Non-compliance of care with national protocol	Facilitate on-the-job staff training in the management of SAM and strengthen follow up until full recovery	Organize refresher training and provide staff with copies of national protocol. Increase supportive supervision especially for CSCom staff
Frequent supply stock outs	Improve supply management	Help CSCom and district staff to better estimate supply needs and ensure timely delivery.

The HFP team used some data collected to compare the economic returns to selected crops. The major labor input is the hand watering required during the dry season. Okra is by far the most cultivated because it is less likely to be attacked by pests than tomato and melon, for which returns are considerably higher.

Table 8: Economic returns of selected crops

Measure	Tomato	Eggplant	Okra	Melon	Cucumber
Growing cycle length	3 mos.	3 mos.	2 mos.	3 mos.	2 mos.
Input (seed) cost per 100 m ² in FCFA	1,500	650	300	600	650
Labor in days/100 m ²	58	54	79	51	36
GVA/100 m ² in FCFA, average year	72,500	25,000	42,500	56,250	29,750
GVA /day of labor in FCFA, average year	1,250	470	540	1 100	830

GVA =gross value added

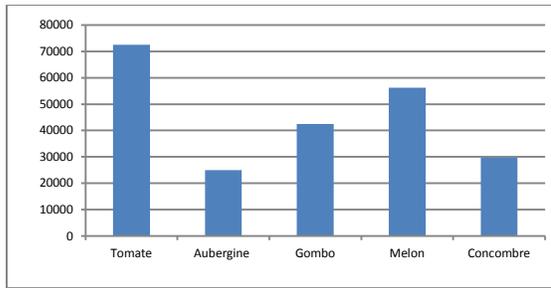


Figure 3: Gross value added per 100m²

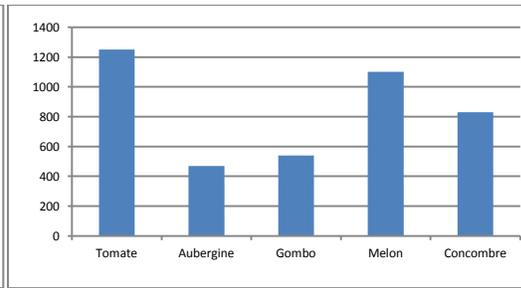


Figure 4 : Gross value added by labor

V. Challenges and future directions

Nutrition Sector

Although the project was able to exceed all SPHERE standards for treatment the problem of shortages of treatment foods remains a challenge in both regions. In addition, frequent staff turnover means that regular repeat training is necessary to reach newly arrived agents.

Without project support there would not be regular supervisions of health centers by district and regional staff due to insufficient funds available to them to cover the cost of fuel to make these visits and overburdened staff. The project nutrition field agents also had a very heavy workload; an average of 16 villages per agent to supervise.

Despite the regular coordination meetings held among nutrition partners, the differences of various partners' policies regarding per diem for partners and incentives for volunteers created challenges since HKI tries to limit or avoid these payments and instead use non-financial recognition for motivation.

Food Security Sector

The project life was short to guarantee the sustainability of the new production techniques, but we are optimistic that the improved production returns and the community cooperative structures that the project reinforced as well as the links with government extension services and private suppliers will help ensure continuation of the HFP activities. Continued support is probably necessary for the continued access to OFSP vines and expansion of their cultivation, as the crop is unfamiliar in the project area.

Because the HFP activities needed rapid start-up, the project chose to build on existing community gardening infrastructure, where membership was predetermined. As a consequence, the project team had less flexibility to target the *most* vulnerable households in the selected communities, but certainly all beneficiaries were vulnerable.

The very low literacy of women in Mali's rural villages imposes an important constraint on the economic opportunities they could pursue with improved production skills. Linking them with literacy programs would likely enhance the impact of such investments.

