

HKI's Enhanced-Homestead Food Production Program Contributes to Increased Food Production, Consumption, and Diet Diversity among Vulnerable Households in Pursat and Prey Veng Provinces

The Enhanced-Homestead Food Production (E-HFP) project is funded under the European Union (EU)'s Food Facility Project.

The results from Round 1 and 4 of project monitoring demonstrate that E-HFP enables households to produce and consume more micronutrient-rich foods, to diversify their diet and thereby to increase the quality of their diet. The findings suggest that households use surplus produce to generate income, which is used to purchase other food items. Thus, with technical assistance and support from the E-HFP project, households can produce a wider variety of fruits and vegetables throughout the year for family consumption and income generation. Additionally women's active involvement in both tending the home garden and control of home garden income significantly contributes to their empowerment. Therefore, the livelihood of households is increased through E-HFP.

Introduction

Food insecurity remains an acute problem at the community and household level in Cambodia despite the fact that the country has been largely food sufficient at the national level for the last few years. High rates of food insecurity, malnutrition and poor health status remain endemic in many areas of the country. The recent food and economic crisis has had a considerable impact on poor households in Cambodia and is likely to have adverse consequences on the nutritional status of women and children. The 2008 Cambodia Anthropometric Survey (CAS) reported that 40% of children under five years of age were stunted¹.

Often the diet of rural Cambodians lack micronutrients and diversity due to low access and limited availability of both the plant and animal source foods needed to meet nutritional requirements. The daily caloric consumption among food insecure groups is on average 1,435 kcal, about 20% below the minimum dietary energy requirement of 1,715 kcal for a sedentary level of physical activity. The daily average Cambodian energy consumption consists of 75% carbohydrates, 14% fats and 11% proteins². This barely meets the minimum recommended intake by FAO/WHO which is 55-75% carbohydrates, 15-30% fats and 10-15% protein. An estimated 69% of the average total daily energy intake is from cereals, with meat and fish each contributing only 4% and vegetables and fruits together contributing 4%. This consumption pattern indicates significantly low dietary diversity and a strong reliance on cereals by Cambodian families, especially food insecure households.

Helen Keller International (HKI) started an HFP program in 1998; it has since supported more than 40,000 households representing approximately 200,000 beneficiaries in 12 provinces of Cambodia³. HKI's E-HFP model integrates agriculture production with improved consumption at the



Village Model Farm in Pursat Province

household level by increasing access to food and educating families on optimal nutrition practices. HKI's E-HFP programs implemented in Cambodia provide evidence that household food production combined with nutrition education has a positive impact on livelihood, poverty alleviation, food security, nutritional status, family income, and women's empowerment amongst the rural poor, especially women and children⁴.

Brief Description of the Project in Pursat and Prey Veng Provinces

With support provided under the EU's Food Facility Project and in collaboration with local NGOs, Centre for Livestock and Agriculture Development (CeLAgrid), Organization to Develop Our Villages (ODOV), Provincial Department of Agriculture (PDA) and Provincial Health Department, HKI's E-HFP program is currently operating in six selected districts of Pursat and Prey Veng provinces. The project aims at improving food security, nutritional practices and livelihood among 6,300 vulnerable households, with a beneficiary population of approximately 31,500. To achieve this objective, the project emphasizes capacity development of local partner NGO staff, government institutions, local commune councils and community members. E-HFP requires a sustainable village-level system to generate and deliver agricultural inputs in order to increase agricultural production, the consumption of nutritious foods, income and livelihood among vulnerable households. This has been done through the establishment of 300 Village Model Farms (VMFs) that serve as an archetype, a centre for training for group members, and as a source of agricultural inputs and technical information for twenty designated households. The key role of VMF owners is to produce agricultural inputs for household gardens as well as raise small livestock such as chickens and ducks for distribution to target households on a commercial basis. Two women's groups that include the 20 poorest families work in collaboration with each VMF. These groups are being established to train, support, and enable women to set up year-round household production of nutritious plant and animal-source foods with a diversity of crops. This bulletin describes a comparison of findings on the outcome of this project implemented during a period of four and sixteen months using data collected by a routine project monitoring system.

¹ Cambodia Anthropometry Survey, 2008, Ministry of Planning, Cambodia

² Cambodia Socio-Economic Survey, 2004, Ministry of Planning, Cambodia

³ History of Helen Keller International's Work, 2011, Helen Keller International Cambodia

⁴ Proposal to European Union, 2009, Helen Keller International Cambodia

Methodology

HKI's routine project monitoring system collects data from sampled VMFs and households every four months. Data from two rounds of project monitoring were used to make a comparison of the project status. Data from Round 1 was collected during the months of May-August 2010, after four months of project implementation. Round 4 data was collected during the months of May-August 2011, after sixteen months of project implementation. The highly experienced monitoring team consisted of enumerators from Provincial and District Agricultural Offices (PDAO) and HKI. Enumerators from PDAO received training from HKI on the E-HFP program and monitoring procedures.

VMFs and households included in the monitoring rounds were a cross-section of the sample from different villages. A total of 60 VMFs and 240 households were randomly selected to be monitored in Round 1, and another random selection of the same number of VMFs and households was made for Round 4.

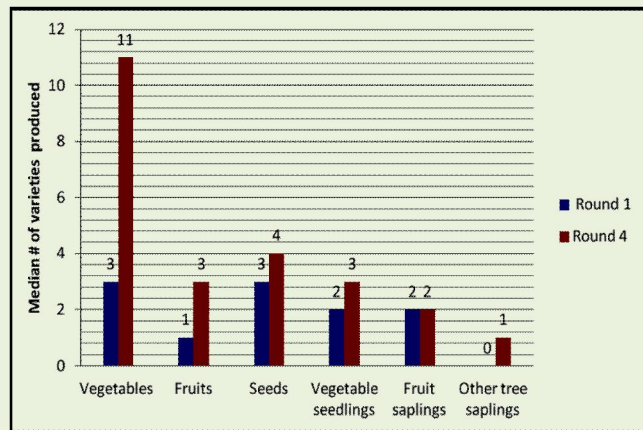
Two different questionnaires were used for monitoring: "VMF Form" to gather information about the VMF and "Household Monitoring Form" to obtain information at the household level. The "VMF Form" includes questions about the area, varieties and quantities of vegetables, seeds, seedlings, saplings, poultry and eggs produced, distributed, sold, and income generated. Information on rice production was also collected from the "VMF Form". The "Household Monitoring Form" obtained information on the type of garden, source of seeds and the number of varieties and quantities of vegetables, fruits and rice produced and sold. The amount of poultry and eggs produced and sold was also assessed. Information was also obtained on the household consumption of fruits, vegetables and poultry products.

Results

Availability and accessibility of micronutrient- rich food

VMFs serve as community demonstration and educational sites for improved agricultural practices. Additionally VMFs provide agricultural inputs and technical information for their twenty designated households; they produce seeds, seedlings and saplings of rice, vegetables, and fruits. **Figure 1** illustrates an increase in the varieties of vegetables, fruits, seeds, vegetable seedlings, and other tree saplings that VMFs produced, distributed to households, and in some cases sold to local markets. In Round 1, VMFs were producing only 3 different varieties of vegetables for households; this rose to 11 varieties by Round 4 monitoring. The diversity of VMF agricultural inputs is expected to create diversity in household and beneficiary food production, thereby increasing the quality of individuals' diets in the community. The VMF's agricultural inputs make micronutrient-rich food available and accessible in the community. The VMF's reliable productivity supports community members by providing agricultural inputs.

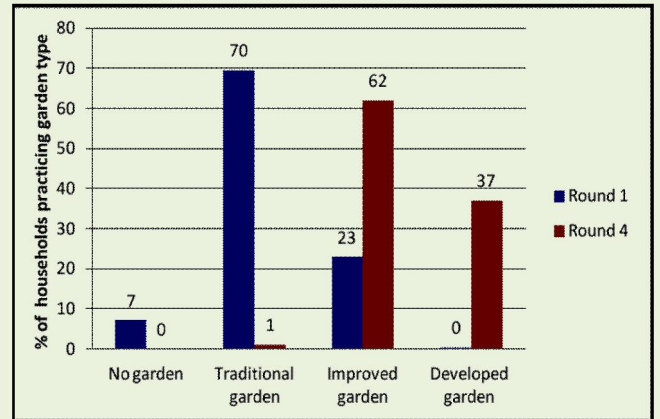
Figure 1: Varieties of VMF agricultural inputs distributed and sold in the last two months. *Values are medians.*



Gardens are characterized as *traditional, improved or developed*. *Traditional gardens* are identified as scattered plots with a limited number of traditional vegetables (gourds) that are grown seasonally. *Improved gardens* generate a number of vegetables that are cultivated seasonally on a fixed plot. *Developed gardens* produce a wider range of vegetables in fixed plots throughout the year. An objective of the E-HFP program is to increase the number of *improved* and *developed* gardens maintained by participating households, and subsequently increase the diversity of produce grown.

Figure 2 shows the proportion of households practicing different garden types during Rounds 1 and 4 of project monitoring. Of the 240 households assessed in Round 4, 37% had a *developed garden*. This is a significant finding because none of the 240 households in Round 1 had developed gardens. In Round 1 monitoring, the proportion of households practicing *traditional* and *improved gardens* were 70% and 23% respectively. However, the Round 4 monitoring results showed only 1% of households practicing *traditional gardens* and 62% of households practicing *improved gardens*. The trend towards households practicing *improved* and *developed* gardening is a positive impact of the E-HFP project. Participating households have the capacity to produce a wider range of fruits and vegetables throughout the year, making micronutrient-rich food more available and accessible.

Figure 2: Changes in the proportion of household gardening practices during Round 1 (N=240) and Round 4 (N=240). *Values are percentages.*



Household Production

The effect of an increase in variety of VMF agricultural inputs and development of *improved* and *developed gardens* is illustrated in both the diversity and amount of vegetables and fruits produced at the household level. **Figure 3** shows the expansion of vegetables and fruits in household gardens. In Round 1 the median number of varieties of vegetables growing in household gardens was 5, in Round 4 this doubled to 10 varieties. An increase in vitamin A rich vegetables is also evident between Round 1 and 4, 2 varieties to 4 varieties respectively.

Figure 3: Varieties of vegetables and fruits grown in household gardens, including vegetables and fruits rich in Vitamin A. *Values are medians.*

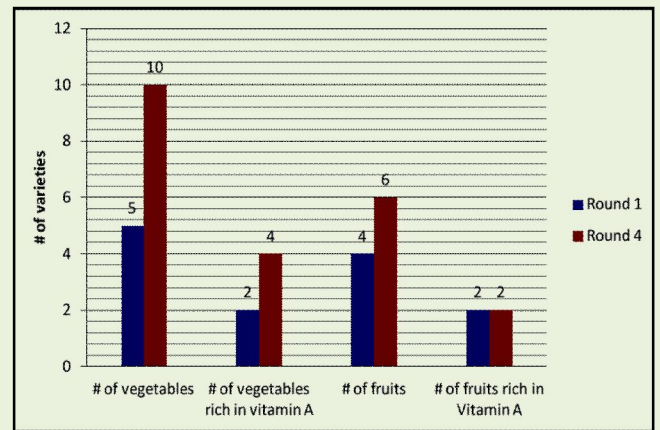
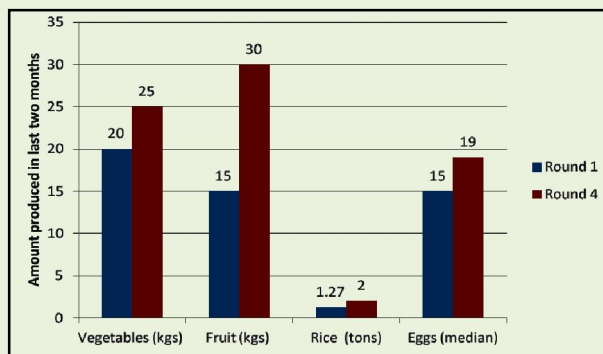


Figure 4 illustrates the quantity of vegetables, fruits, rice and eggs produced by participating households in the last two months of Round 1 and Round 4. Median production of vegetables and fruits in the last two months before the monitoring data was obtained was higher at Round 4 than Round 1 (25 kg vs. 20 kg) and (30 kg vs. 15 kg) respectively. The median number of eggs produced in the last two months of Round 1 was 15 and in the last two months of Round 4 was 17. The amount of rice produced rose from 1,270 kg (1.27 tons) in



Round 1 to 2,000 kg (2 tons) in Round 4. The expansion in vegetable and fruit production can be attributed to VMF inputs and technical assistance as well as the development of *improved* and *developed gardens*. VMF technical assistance and the evolution of poultry inputs on household farms contribute to rice and egg production. It is important to note that both Round 1 and Round 4 occurred during the same time of year: May through August. Therefore seasonal changes in production are not a significant factor.

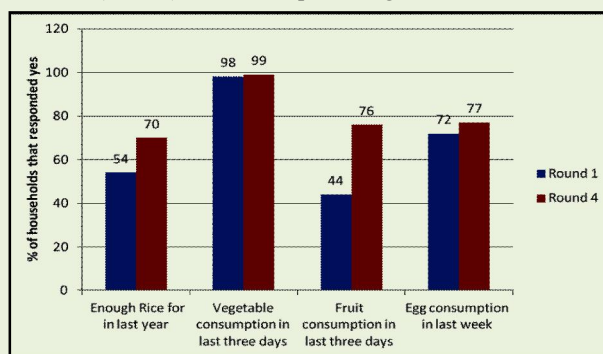
Figure 4: Production of vegetables, fruits, rice, and eggs in last two months of Round 1 (N=240) and Round 4 (N=240). Values are medians.



Household Consumption

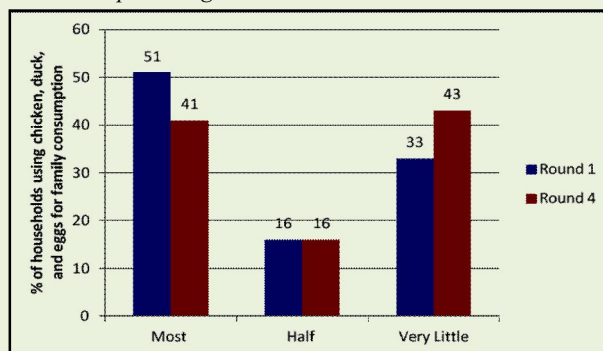
The agricultural inputs from VMFs, expanded gardens, and the diversity and volume of household production contribute to household food security and intake of micronutrient-rich food. **Figure 5** illustrates the increase in household consumption between Round 1 and Round 4 of project monitoring. During Round 1, only 44% of households responded that they had eaten fruit in the last three days. In Round 4, 76% of households consumed fruit in the last three days. Vegetable consumption did not change between Round 1 and Round 4 project monitoring.

Figure 5: Percentage of households that responded they had eaten rice, vegetables, fruit, or eggs in a given time period during Round 1 (N=240) and Round 4 (N=240). Values are percentages.



It is apparent from **Figure 6** that there has been a decrease in the proportion of households who consume chickens, ducks, and eggs produced from their homestead gardens and poultry production. In both Round 1 and Round 4, 16% of households consumed half of their poultry production. However in Round 1, 51% of households said they consumed most of their poultry production but this figure went down to 41% in Round 4. Subsequently 33% of households consumed very little of their poultry production during Round 1, but this figure rose to 43% during Round 4. It was observed in the field that one of the main reasons for not consuming eggs is that a majority of eggs are used for hatching which gives them more number of chicks and eggs to sell. Instead of consuming poultry, duck, and eggs, a considerable proportion of households decide to sell or trade their poultry production.

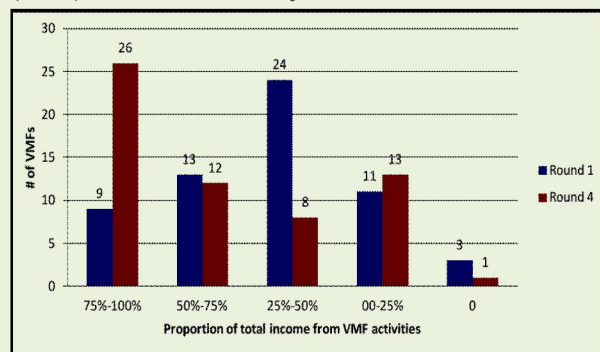
Figure 6: Percentage of households who are using their chicken, ducks, and eggs for family consumption during Round 1 (N=230) and Round 4 (N=240). Values are percentages.



Income generation and utilization

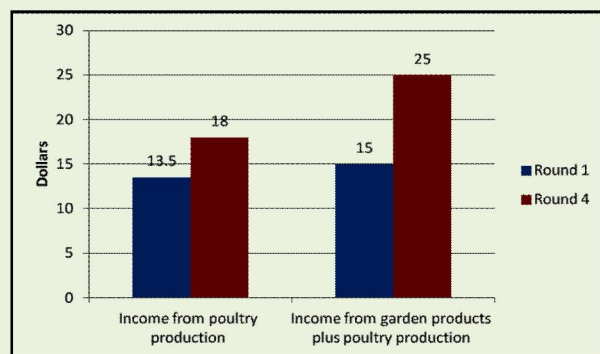
VMFs greatly benefit from E-HFP activities. The input of seeds and agricultural assistance from E-HFP NGOs greatly influences both the income and livelihood of VMFs and their families. The proportion of VMFs' family income from E-HFP activities is shown in **Figure 7**. Only 9 of the 60 VMFs monitored in Round 1 received 75%-100% of their income from E-HFP involvement; this number increased nearly three-fold for VMFs monitored in Round 4.

Figure 7: Proportion of total family income from VMF activities in the last two months during Round 1 (N=60) and Round 4 (N=60). Values are number of VMF households.



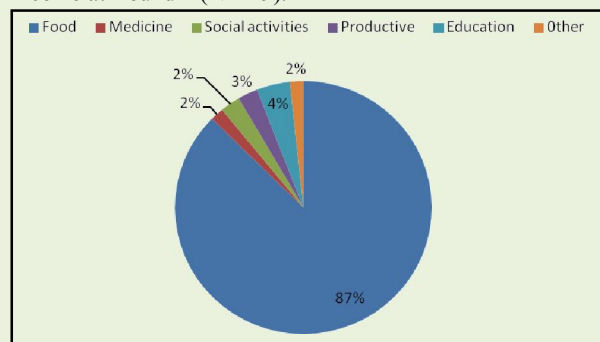
Households did not only increase their production and consumption of micronutrient foods during Round 1 and Round 4, but they also were able to generate income from both garden and poultry production (**Figure 8**). Surplus, homegrown vegetables and fruits as well as eggs and chickens from homestead food production can be sold in local markets to supplement household income. During Round 1, the median income from both garden and poultry production was \$15; income rose to \$25 in Round 4.

Figure 8: Income from poultry production and gardens plus poultry production during Round 1 and Round 4 in last two months. Poultry Production: Round 1 (N=86), Round 4 (N=103). Garden plus poultry production: Round 1 (N=121), Round 4 (N=164). Values are medians (dollars).



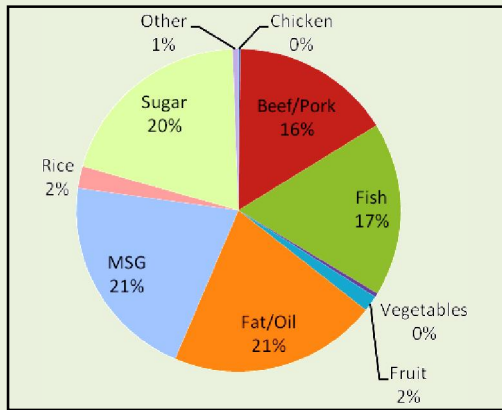
Of the households interviewed in Round 4, 87% (N=104) used the income earned from the sale of E-HFP garden produce to purchase additional food for the household (**Figure 9**). Small proportions of households also used the income earned from the sale of garden products on other important household expenditures such as education, productive, and medicine. Round 4 data is presented because it is the most current.

Figure 9: Products purchased with generated household garden income at Round 4 (N=119).



Round 4 results showed that Monosodium Glutamate (MSG), oil/fat, sugar, fish, and beef/pork were among the most common food items purchased from produce-generated income (Figure 10). Of the 104 households who spent E-HFP garden income on food, only a small number of households used the income on rice and fruit and none on chicken and vegetables. The income from E-HFP gardens helps households purchase food items that they do not produce themselves. Round 4 data is presented because it is the most current.

Figure 10: Food products purchased with generated household garden income at Round 4 (N=104).



Women’s Empowerment

In Round 4, women were the sole caretaker for 21% of homestead gardens, while 67% of homestead gardens were tended by both the husband and wife (Table 1). Women held the money from homestead garden income in 92% of households. Women’s involvement in homestead food production and income contributes to their overall empowerment level. E-HFP gives women more control over household resources from the income generated for their homestead food production activities. Such control over E-HFP resources and income is likely a factor in how the E-HFP program enhances women’s participation in household decision-making. Round 4 data is presented because it is the most current.

Table 1: Main caretaker of home garden and money holder of income from home garden. Values are percentages.

	Caretaker (N=240)	Money Holders (N=119)
Husband	4	1
Wife	21	92
Both	67	0
Children	1	0
Grandparents	7	0
Other	0	7

Conclusions and Recommendations

While there has been a significant change in gardening practices by households, more efforts could focus on promoting *developed gardens* throughout the majority of households. *Developed gardens* are important in ensuring year-round availability of vegetables and fruits for household consumption and sale. Evidence from past E-HFP project evaluations show that those households with *improved* and *developed gardens* have a higher frequency of vegetable and fruit consumption per week.⁵ E-HFP has the capacity to ensure sustainable *developed gardens* for target households.

The findings from Round 1 and Round 4 of routine project monitoring provide evidence that HKI’s E-HFP model enables households to produce more micronutrient-rich foods so that they can improve household consumption and diversify their diet. Another significant finding is that income generated from E-HFP allows households to purchase other important food items. Most of the home garden-generated income was used to purchase MSG, oil/fat, sugar, beef/pork and fish. Both improved production for household consumption and income generated from the sale of E-HFP produce can improve household food security and livelihood among vulnerable households, especially women. In the last one year of the project, food security, livelihood, and nutritional consumption have improved among the targeted beneficiaries which are the most important objectives of EU Food Facility project.

While household consumption increased and became more diversified, a significant proportion of households chose to sell their poultry production instead of consume it. Households chose to use their eggs for hatching rather than consumption. While the selling of surplus produce and poultry production is encouraged, it is essential that households consume nutrient-rich foods and protein-rich meat. Higher consumption of animal production might be seen if future E-HFP projects in Cambodia focus on providing egg and animal inputs that are tailored to the consumption patterns of households.



Household Garden

⁵ Talukder A, Kiess L, Huq N, de Pee S, Darnton-Hill I and Bloem MW. Increasing the production and consumption of vitamin A-rich fruits and vegetables: Lessons learned in taking the Bangladesh homestead gardening programme to a national scale. Food and Nutrition Bulletin 2000, vol. 21, no.2: 165-172

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