

Operations Research Brief



USAID
FROM THE AMERICAN PEOPLE



Helen Keller
INTERNATIONAL

A Multisectoral Response to Malnutrition Improves Food Production and Nutrition Practices Among Women and Children in Nepal

This project and related operations research revealed how food security interventions combined with proven nutrition actions can have substantial effects on the quantity and diversity of food produced, infant and young child feeding practices, and health-seeking behaviors in households in the Far Western Region of Nepal.



Credit: HKI/George Figdor

A mother and her child in Nepal.

Key Findings:

- Use of a multisectoral model that combined village model farms with behavior change communication to promote adoption of essential nutrition actions improved household food production; income; nutritional knowledge and practices; and health-seeking behaviors.
- The model's governance component helped strengthen national, community, and local government capacity to manage the multisectoral initiative.
- Further research is needed to determine the appropriate model for improving child growth outcomes.

MARCH 2014

The Challenge

Nepal has one of the world's highest rates of chronic malnutrition among women and young children. The government has developed a comprehensive, multisectoral National Nutrition Action Plan (NNAP) to respond to this crisis, but several challenges remain to implementing the policy across such a geographically diverse country. Such challenges include limited household resources for producing sufficient nutritious foods and cultural practices that restrict feeding animal products to young children and that encourage women to eat less during pregnancy.

Programmatic Context

Helen Keller International (HKI) and its partners implemented a study in Baitadi district in the Far Western Region of Nepal to test the impact of a multisectoral food production model on a range of food security, nutrition, and health outcomes. The study was nested within the broader Action Against Malnutrition through Agriculture (AAMA) project (2008–2012), which aimed to reduce child malnutrition and related mortality in Bajura, Baitadi, and Kailali districts. The AAMA project reached approximately 190,000 women of reproductive age and children under five in the three target districts.



Credit: HKI/Lindsay Locks

A woman practices improved agricultural techniques on a village model farm.

This project and embedded operations research were funded by the U.S. Agency for International Development (USAID) through the Child Survival and Health Grants Program and the USAID Mission in Nepal, with US\$2,327,675 and a match of \$535,231 by Helen Keller International (HKI). It was implemented by HKI, in collaboration with Nepal's Ministry of Health and Population and Ministry of Agriculture and Cooperatives; the national NGO Nepali Technical Assistance Group (NTAG); three local NGOs (Nepal National Social Welfare Association, Women's Development Forum, and Snehi Mahila Jagaron Kendra); as well as district leaders and communities.

Innovative Interventions Tested

AAMA was based on HKI's Enhanced Homestead Food Production (EHFP) model, which teaches improved techniques for producing diversified animal and plant-source foods coupled with the promotion of "Essential Nutrition Actions" among mothers groups (see Box). The project relied on Female Community Health Volunteers (FCHVs) and village model farmers

BOX. Project Components of the Enhanced Homestead Food Production (EHFP) Intervention

Homestead Food Production: Village model farms (VMFs) were established to serve as demonstration and training sites for improved agricultural and animal husbandry techniques and to provide an ongoing supply of farming resources for households. Each VMF supported 20–40 women organized into two groups. Approaches were also developed to adapt to the needs of landless and other disadvantaged groups. (For more information about HFP, see <http://www.hki.org/reducing-malnutrition/homestead-food-production/>.)

Behavior Change Communication: Working with local partners, the project developed targeted strategies to overcome traditional misconceptions about food and feeding practices and to encourage mothers groups to adopt "Essential Nutrition Actions," which include optimal women's nutrition, breastfeeding, and young child feeding practices; and integrated control of anemia and of vitamin A and iodine deficiency. After receiving limited training in how to negotiate behavior change as well as flip charts with key messages, FCHVs provided nutrition counseling to the mothers groups that met at the VMFs. (For more information about Essential Nutrition Actions, see <http://www.hki.org/reducing-malnutrition/essential-nutrition-actions/>.)

Multisectoral governance: The project brought together decision-makers from multiple ministries (notably Health, Agriculture, and Local Development) to strengthen planning and coordination of nutrition and food security initiatives at national, district, and village levels and to empower local partners to assume responsibility for providing technical assistance to communities.

to convey key nutrition messages. In addition, a governance component attempted to strengthen planning and coordination among ministries.

The operations research evaluated the impact of HKI's EHFP model specifically in Baitadi district. Outcomes of interest included food production (volume and diversity); household income; feeding practices among women, infants, and young children; and nutritional status of young children and their mothers.

Research Methodology

The study used a cluster randomized controlled design, which involved matching eight sub-districts (*Ilakas*) in Baitadi district by socioeconomic characteristics and then randomly assigning one of each pair either to receive the intervention ("treatment") or to not receive it ("control"). Each *Ilaka* had 5 Village Development Committees (VDCs), and each VDC had nine wards. In the intervention group, a village model farm (VMF) was established in six of every nine wards per VDC, for a total of 122 VMFs. The owners of these VMFs, plus 3,329 women along with their households, participated in the program as direct beneficiaries.

Baseline and endline surveys were conducted three years apart, and included anthropometric measurements and finger prick blood samples from surveyed mothers and children. The baseline sample included 1,055 treatment and 1,051 control households; endline samples comprised 1,307 treatment and 1,307 control households. Ethical approval was obtained from the Nepal Health Research Ethics Committee.

This brief presents the changes in key outcome variables from baseline to the end of the intervention within each of the treatment and control groups. Further analysis is currently being undertaken to compare the differences in changes to these outcomes between the two groups.

Research Findings

These preliminary analyses suggest that the EHFP strategy **improved many of the key outcomes** of interest assessed. After three years of implementation, the intervention group had significantly higher volume and diversity of foods produced; more cash income; better perceptions of food security; improved nutrition and hand washing knowledge and practices; and increased use of antenatal health care services than

at baseline (see Table). The control group also showed significant improvement in most of these indicators over time, but the changes were not as dramatic as observed among the intervention group.

Anemia among women and children was higher at the end of the intervention than at baseline in both groups; however, the magnitude of change was higher in the control group than in the intervention group. Maternal underweight was slightly lower at endline than at baseline in the intervention group, whereas underweight was higher at endline than at baseline in the control group. There was no demonstrated

The Enhanced Homestead Food Production model improved a broad range of food production and nutrition outcomes.

impact of the EHFP strategy on the anthropometric status of children. Plausible explanations for lack of impact on child growth include the short duration of the intervention; insufficient expansion of poultry

TABLE.
CHANGES IN OUTCOMES BEFORE AND AFTER THE EHFP INTERVENTION IN BAITADI DISTRICT, BY STUDY GROUP^a

	Outcome	Treatment	Control
Food Production	Had both home garden and poultry, %	+18.3*	+6.0*
	Eggs produced from HFP, last 2 months, count	+21.8*	+10.0*
Household Income and Food Security	Cash income ≥ Rs. 4,000, last month, %	+26.4*	+13.8*
	Perception of food insecurity, ^b last 30 days, %	-26.1*	-9.1*
Health Knowledge and Practices	Nutrition knowledge, %		
	Eggs good for children 6–12 months old	+51.5*	+1.3
	Meat good for children 6–12 months old	+38.5*	+13.6*
	Women should eat more during pregnancy	+31.4*	+7.4*
	Complementary feeding for children 6–23 months old, %		
	Received minimum dietary diversity ^c	+40.5*	+4.7
	Received minimum meal frequency	+12.6*	+4.2*
	Hand washing practices, %		
	Before feeding child	+31.4*	+2.2*
	After defecation	+47.8*	+17.1*
	After cleaning child's feces	+56.6*	+20.9*
	Antenatal care, %		
	Received any antenatal care	+23.0*	+15.0*
Attended ≥ 4 antenatal care visits	+34.9*	+18.6*	
Nutritional Status	Underweight, women (BMI <18.5 kg/m ²), %	-1.6	+5.5*
	Anemia, women (Hgb <12 g/dL non-pregnant; Hgb <11 g/dL pregnant), %	+5.0*	+14.7*
	Stunting, children (ht-for-age z-score <-2 SD ^d), %	-2.6	-2.3
	Wasting, children (wt-for-age z-score <-2 SD ^d), %	-0.1	-0.4
	Underweight, children (wt-for-ht z-score <-2 SD ^d), %	-2.4	-7.4*
	Anemia, children (Hgb <11 g/dL), %	+2.6	+10.9*

^a n=1,051 households in each of the treatment and control groups at baseline; n=1,307 in each group at endline.

^b Using the Household Food Insecurity Access Scale (HFIAS).

^c Proportion who received foods from 4 or more food groups.

* Differences between baseline and endline within the study group were statistically significant at P < .05.

production; and inadequate strategies to address water and sanitation conditions.

In terms of improved governance, the study showed that the project strengthened **national, community, and local government capacity to manage the multisectoral initiative**. For example, a model was established for joint planning among representatives of the departments of health, agriculture, livestock, planning, education, and women's development, coordinated by local government.

In addition, Food Security and Nutrition Working Groups were created at the local level with participants across many government offices and civil society groups to guide planning. By project end, selected VMFs were nominated by local government officials to continue to serve their communities as HFP resource persons.

The project strengthened national, community, and local government capacity to manage the multisectoral initiative.

Recommendations and Use of Findings

Findings from this study provide evidence of the effectiveness of the EHFP model on a broad range of outcomes related to food production, household income, and nutritional knowledge and practices, with programmatic and policy implications for nutrition programs to accelerate maternal and child health in Nepal and other similar settings. The government of Nepal has contributed funding and technical support to continue and expand the EHFP program. In addition, the USAID mission in Nepal is supporting its replication across 20 of Nepal's 75 districts through the *Suaahara* project, covering the country's terai, hill, and mountain zones.

RECOMMENDATIONS FOR FUTURE PROJECTS: Sustainability of the model will rely on continued strengthening of governance capacity. There is a need to continue supporting local management of such integrated strategies, particularly at district and local levels. With continued investment, improved nutrition and food security will grow and the economic returns of the investment will become clear, providing government more resources to assume responsibility over long-term stewardship.

Water and sanitation and animal husbandry components should be reinforced and expanded.

Evidence from other similar studies has pointed to the importance of safe drinking water, hand washing at critical times, safe disposal of feces, safe storage and handling of food, and protected play areas for toddlers to improve nutritional status. Lessons learned under AAMA also suggest solutions for vaccination supply chains and poultry management to increase egg and flock production.

These improvements have been incorporated into the Suaahara strategy as well as HKI's other EHFP programs.

Further research is needed to determine the appropriate model for influencing child growth outcomes. The EHFP model tested in this study may not be sufficient to reverse child stunting in settings with extremely high prevalence. More research is needed to determine if longer exposure to the EHFP model would lead to better child growth outcomes or if combining the EHFP model with a reinforced strategy to reducing and treating infections would have greater impact.

The Action Against Malnutrition through Agriculture (AAMA) project in the Far Western Region of Nepal was supported by the American people through the United States Agency for International Development (USAID) through its Child Survival and Health Grants Program. AAMA was managed by Helen Keller International under Cooperative Agreement No. GHS-A-00-08-00001. The views expressed in this material do not necessarily reflect the views of USAID or the United States Government.

For more information about the project, contact Jennifer Nielsen at Jnielsen@hki.org. The Final Evaluation (including the Operations Research report) is available at <http://bit.ly/1jTMRUX>.