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HERAN DEMISSIE • SAVE THE CHILDREN

Implementing, Evaluating, and Adapting: ENGINE as a Learning Project

To catalyze positive change in communities' nutrition behaviors—an essential step in the prevention of childhood stunting—projects must understand the social and cultural drivers of communities' and individuals' decisions and actions regarding their diets. The design of the Empowering the New Generation to Improve Nutrition and Economic opportunities (ENGINE) project therefore included a robust system of monitoring, evaluation, and research activities to assess the impact of its interventions on maternal, infant, and young child nutrition behaviors and outcomes. These assessments produced evidence for the effectiveness of the project's activities, helped ENGINE rapidly identify challenges in implementation, and informed the development ➤

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EMPOWERING NEW GENERATIONS TO IMPROVE NUTRITION AND ECONOMIC OPPORTUNITIES



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of context-specific solutions. The project shared its results widely with donors, government, and other development partners to facilitate scale up. By continuously learning from its experience and adapting as necessary, ENGINE

was responsive to communities' needs, a key aspect of its overall success. The following examples show how ENGINE's activities evolved in response to lessons learned during implementation.

LIVELIHOODS ACTIVITIES

Finding a safe source of leafy greens: In the first year of implementation, ENGINE included lettuce among the selection of seeds provided to most vulnerable households (MVHHs). However, most households did not know how to properly wash and consume the raw leaves, leading to concerns regarding food hygiene. The project therefore removed lettuce from its offerings and instead scaled up the provision of kale, Swiss chard, and cabbage, which are traditionally served cooked in the local cuisine, reducing the risk of transmitting bacteria or parasites and facilitating the complementary feeding of infants.

Optimizing vegetable selection: In its first year, ENGINE promoted the same nutritious vegetables in all *woredas*, irrespective of agro-ecologic zone. However, productivity and disease resistance of some varieties was poor in some areas. ENGINE thus revised its approach to select vegetables that grow well in each agro-ecologic zone.

Supporting families' nutrition by increasing income: The original design of ENGINE's livestock activities provided MVHHs with support for either homestead gardening or livestock activities, not both. However, the project soon realized that few of the MVHHs' gardens were irrigated and thus harvests were limited to about four months per year. An assessment of participants' income found that the sale of vegetables

did not bring in as much revenue as the sale of animal products, thus farmers who cultivated vegetables alone lacked a sufficient amount of animal-source foods, essential for children between six months and two years of age. ENGINE revised its approach and provided all MVHHs with support for both homestead gardening and animal husbandry so that income from the sale of offspring or animal products could be allocated to the purchase of nutrient-dense food in the months when gardens aren't productive and families could consume meat, eggs, and milk.

Identifying a locally-acceptable source of animal protein: The project adapted its livestock activities when it realized that education on the nutritional benefits of sheep and goat milk was not enough to convince people to drink it in areas of Ethiopia where it is not customarily consumed. Households who raised goats or sheep in these areas were only benefitting from the annual or bi-annual sale of fattened sheep or lambs, unlike the families of chicken or dairy cow farmers who ate eggs or drank milk all year. To provide the households raising sheep and goats with more animal source foods, ENGINE developed a cost-share program that enabled households to purchase a dairy cow, a source of milk more acceptable in local cultures. Households contributed about 65 percent of the cost of the cow, earned from the sale of their sheep or goats, and ENGINE covered the rest of the cost.

FACILITY-BASED NUTRITION SERVICES

Improving the quality of nutrition services in health centers: Part of ENGINE's mandate was to strengthen the provision of nutrition counseling and treatment of malnutrition within the health system. The project's initial approach in this area was to bolster in-service training of health workers through an improved, integrated curriculum for nutrition. However, ENGINE realized that classroom-based training was insufficient to develop health workers' counseling skills and

affect significant change at the health center level. The project thus developed a set of indicators to track the quality of nutrition services at the facility level and supported 224 facilities to implement a quality improvement program. Facilities made marked improvements in the provision of nutrition counselling and services, such as increasing the proportion of antenatal care clients counseled on nutrition from 8 to 100 percent and providing all pregnant women with iron/folate supplements.



NUTRITION-SENSITIVE AGRICULTURE

Addressing slow start-up of activities in farmer training centers (FTCs) and school gardens: To expand the introduction of homestead gardening of nutrient-dense fruits and vegetables and small animal husbandry, ENGINE identified two to four FTCs in each project-supported *woreda* and 161 schools where project-supported agricultural extension workers (AEWs) introduced these nutrition-sensitive agriculture (NSA) activities to the surrounding communities through agricultural and cooking demonstrations.

ENGINE found that start-up of the FTC and school-based activities was slow and implemented an assessment to identify the root cause of the delays. The March 2014 study found that much of the problem was due to the choice of FTCs and schools—58 percent of the FTCs and 47 percent of schools had no way to irrigate their fields. Twenty-nine percent of FTCs and 37 percent of schools did not have a fence to protect crops from wild animals and seven percent of schools' garden plots and two percent of the FTCs' fields were unsuitable for vegetable and fruit cultivation.

ENGINE therefore replaced the FTCs and schools that lacked the conditions necessary for farming. The pace of demonstrations increased and by the project's end, ENGINE-supported FTCs and schools had reached 42,690 farmers with vegetable production and cooking demonstrations.

Increasing ENGINE's influence using positive role models: Reaching farmers through the FTCs was successful, however the project found it difficult to track the number of farmers who implemented the practices demonstrated at the centers, and their reach was limited. ENGINE observed that many neighbors of MVHs adopted NSA practices after observing the homestead gardening and animal husbandry activities. Therefore, in the fourth project year ENGINE began supporting the Government of Ethiopia's model farmer approach by training 9,660 farmers who were early adopters of improved agricultural technologies, economically better-off, or regarded as thought leaders about the importance of proper nutrition and NSA strategies. These model farmers were expected to implement what they learned and pass the information on to others in their communities.

A March 2016 assessment of 80 model farmers found that all had adopted new agricultural technologies since their training and the proportion of respondents who cultivated vegetables increased from 86 percent prior to the intervention to 100 percent after training. In particular, the farmers reported growing more leafy greens, pumpkin, and sweet potato. Ninety-five percent of the model farmers reported consuming part of their harvest and selling the rest, which has positive impact on both their household's nutrition and the availability



of fruits and vegetables in the market. The majority (85 percent) of these farmers had access to irrigation, enabling them to continue growing vegetables for their families and for sale in the market during the dry season when many families struggle to meet their nutritional needs. Perhaps most importantly, 80 percent of respondents reported knowing of other farmers who adopted NSA practices as a result of what they had learned from the model farmers. The group estimated that about 615 farmers had started growing vegetables in the season directly following the training, an average of about nine new adoptees per model farmer.

Prevention of overgrazing: In year two, ENGINE assessed its environmental impact mitigation activities. The project purchased animals from the local market to avoid increasing pressure on existing pastures and promoted preservation of storage crop residues for animal feed. However, many MVHHs had little or no grazing land or crop residue, resulting in malnourished flocks. ENGINE therefore trained AEWs on the growth of forage crops such as Sesbania, Tree Lucern, and elephant grass, which can be grown near homes on land that is not generally used for other crops. These crops are high in Vitamin A and other nutrients, leading to healthier,

more productive livestock. More than 60 percent of the MVHHs who raised goats and sheep adopted this “backyard foraging” technique.

Provide and promote appropriate poultry breeds: ENGINE initiated its livelihoods activities with commercial hens that lay many eggs. Farmers complained about these breeds however, because their eggs are sterile and they must be fed because they do not scavenge. Local breeds of chicken scavenge for their food, but lay very few eggs. ENGINE partnered with Debrezeit, a local research center, to identify a more acceptable breed. The result was the *koekoek* chicken, which lays more eggs than Ethiopian chickens, can scavenge for some of their food, and supplementary feed can be prepared at home. Demand for these chickens was high and through a partnership with private businesses, ENGINE rapidly increased availability of the *koekoek* breed, contributing to children within ENGINE’s operational zones eating more eggs. Another US-AID-funded nutrition project, Graduation with Resilience to Achieve Sustainable Development (GRAD), subsequently changed its poultry interventions based on this lesson learned.

SOCIAL AND BEHAVIOR CHANGE COMMUNICATION

Engaging with men to empower women: Inequitable gender dynamics within households create barriers to proper maternal, infant, and young child nutrition (MIYCN) in rural Ethiopia. ENGINE therefore designed its livelihoods activities to engage mostly with women with the goal of giving mothers the tools they needed to take control of their families’ diets. However, by using the project’s gender checklist during site visits to MVHHs, ENGINE found that many of the women selected had not participated in project activities. Interviews with the communities revealed that because only one member of each MVHH was invited to orientation sessions, men were suspicious of the activities and forbade their wives from participating. To solve this problem, the project adapted its strategy of engagement with MVHHs and held orientation meetings for 7,319 men to provide information on the package of activities, MIYCN, NSA, and actions men could take to be supportive of their wives’ efforts to improve the family’s diet. To further engage men, ENGINE provided decision-making and communications skills training, particularly regarding MIYCN practices, for 4,498 men.

Improving community conversations: In 2013, ENGINE trained 240 community change agents (CCAs), for a four-month pilot of community conversations aimed at improving nutrition behaviors. The CCAs gave

nutrition talks, read stories, and used illustrated flipcharts to educate more than 3,500 community members about healthy MIYCN practices. The community conversations increased participants’ knowledge of nutrition but ENGINE observed several challenges, including:

- ◆ The heterogeneous nature of the groups, which were comprised of men, young mothers, and mothers in law, hindered discussion and made practicing behaviors and roles difficult.
- ◆ The group sizes—each had 20 to 30 members—were too large for effective conversation.
- ◆ The text-heavy job aids were difficult for CCAs to use, most of whom had low- to moderate-literacy.
- ◆ Ninety-four percent of CCAs were young women, which created challenges in facilitating conversations among elders.

ENGINE used this information to revise the community conversation approach to what it called, enhanced community conversations (ECCs). Each ECC group was homogenous and comprised 15 to 20 pregnant and lactating women, husbands of pregnant or lactating women and fathers of children under two years of age, or grandmothers of children under two years of age. Highly-engaging audio recordings supported the CCAs

The ECC assessment showed significant improvement in participants' dietary diversity—the proportion of children aged 6 to 24 months who consumed food from four or more food groups each day increased from 27 to 52 percent, and the proportion of pregnant or lactating women who consumed five or more types of food per day increased from 8 to 17 percent.

and provided a level of consistency across meetings. In addition to nutrition talks, discussions, and stories, ECCs engaged participants through role plays, games, contests, and singing. ENGINE redesigned the printed materials to be more readily understood by individuals with low-literacy and provided participants with copies to take-home to spark discussion with their families and neighbors.

Comparison of data between baseline and endline assessments showed significant improvement in the ECC participants' behaviors related to MIYCN. For instance, the proportion of participants' children aged 6 to 24 months who consumed food from four or more food groups each day increased from 27 to 52 percent. Similarly, the proportion of pregnant or lactating women who consumed five or more types of food per day increased from 8 to 17 percent.

MULTISECTORAL COORDINATION

Identifying the optimal structure for *woreda* coordination: In the fourth year of the project, ENGINE established 10 *woreda* level nutrition coordination mechanisms using two separate models to compare efficacy. In six *woredas* in Amhara, Tigray, and West Oromia, the committees were led by *woreda* administrators. In two *woredas* in SNNPR, the bodies were led by the *woreda* health offices. And in two *woredas* in East Oromia, leadership was initially assigned to the *woreda* health office, but based on recommendations from the technical committee, leadership was transferred to the *woreda* administrator. Using the *woreda* administrators to lead the coordination bodies appeared to be the most functional

model in Ethiopia. In *woredas* where the coordination bodies were chaired by the *woreda* administrator, meetings were held regularly and the sector heads were actively engaged. The committees created joint work plans that clearly delineated the responsibilities of each sector and aligned with a monitoring and evaluation plan that was used to track and report progress to the *woreda* administrator. Structuring the governance of the committee in this way not only ensured accountability for the work but facilitated the integration of nutrition into the *woreda* development and poverty reduction agendas by bringing it to the attention of political leaders.

DOCUMENTING AND SHARING

ENGINE disseminated its results and lessons learned through policy and technical papers, journal articles, conference presentations, and reports so that other implementing organizations, donors, and the Ethiopian Government could use the information to adapt their programming, leading to improved services. For instance, development partners, donors, and the Government of Ethiopia took notice of an ENGINE policy brief that questioned the status quo regarding management of children with moderate acute malnutrition and the mid-upper arm circumference cut-off for admission and discharge from treatment in cases of severe acute malnutrition.

The Government of Ethiopia changed its approach to addressing water, sanitation, and hygiene (WASH) practices in reaction to information ENGINE presented in a paper titled, *Determinants of Stunting in Ethiopia*. The paper inspired donors to include funding for WASH interventions within nutrition programs, including ENGINE's follow-on project, Growth Through Nutrition. The project's WASH Observational Study also attracted interest from partners and donors and the Federal Ministry of Health used the study to inform a policy brief on the determinants of stunting in Ethiopia.



Growth Through Nutrition will carry forward many of ENGINE's successful interventions and lessons learned. It will expand the use of model farmers and continue the MVHH approach, scale it to reach more households, and link farmers more directly with the private sector for inputs. This continued commitment to learning and quality improvement will be the foundation of Growth Through Nutrition's success in improving nutrition in Ethiopia, just as it was for ENGINE.

LOOKING FORWARD

As Growth Through Nutrition begins implementation, it is carrying forward many of the successful interventions and lessons learned from ENGINE. It will expand the use of model farmers and continue the MVHH approach, scale it to reach more households, and link them more directly with the private sector for inputs. To bolster individual farmers' and FTCs' success, Growth Through Nutrition will provide additional training for the marketing and sale of produce and animal products and financial training for managing income. Expanded training on feeding, care, and management of livestock will ensure farmers reap the greatest profit possible from their flocks, both economically and nutritionally. By identifying additional opportunities to engage the private sector in NSA, from partnerships with seed and livestock suppliers to veterinary services, the project will create sustainability for NSA activities within the economic and agricultural sectors.

Following ENGINE's legacy, Growth Through Nutrition will rigorously monitor and evaluate its activities, analyze the results, and adapt its approach as necessary. The project's learning agenda will focus on rapid implementation-focused research to inform and improve programming. For instance, to better track improvements in diversification of production and consumption of nutrient-dense foods, the project will develop a quality assessment tool and indicators to track the results of NSA trainings and work at the FTCs. This continued commitment to learning and quality improvement will be the foundation of Growth Through Nutrition's success in improving nutrition in Ethiopia, just as it was for ENGINE. ■

ABOUT ENGINE

The Empowering the New Generation to Improve Nutrition and Economic Opportunities (ENGINE) project was the U.S. Agency for International Development Ethiopia Mission's flagship multisector nutrition project. ENGINE, which was implemented from September 2011 to September 2016, built on the Government of Ethiopia's National Nutrition Program and the U.S. Government's Feed the Future initiatives to prevent undernutrition during the first 1,000 days of life, from the start of pregnancy until the child is two years of age. The project was led by Save the Children in partnership with Tufts University, Jhpiego, Land o' Lakes, the Manoff Group, Valid International, and Jimma University and worked in 116 *woredas* across the Amhara, Tigray, Oromia, SNNPR, and Somali regions of Ethiopia.

ENGINE partnered with Ethiopian ministries to strengthen existing multisector coordination and support the development and revision of nutrition policies, guidelines, and standards. It integrated instruction on nutrition into the pre-service curriculum for health and agriculture workers and built the capacity of frontline

workers to provide high quality nutrition services. The project's social and behavior change communication activities promoted optimal maternal, infant, and young child feeding practices and dietary diversity at the community level. Work with vulnerable households educated participants about nutrition-sensitive agriculture techniques and livestock management to increase consumption of nutrient-dense foods and augment household income. ENGINE promoted improved water, sanitation, and hygiene practices to prevent diarrhea in children and improve nutritional status, mainstreamed gender in all its activities, and implemented a rigorous research strategy to support and guide effective nutrition policies and practices.

For more information on ENGINE, contact:

Dr. Habtamu Fekadu, Chief of Party, ENGINE
email: habtamu.fekadu@savethechildren.org
Old Airport P.O. Box: 387, Addis Ababa, Ethiopia
Web: ethiopia.savethechildren.net/ENGINE

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