

# Looking Back to Look Forward: Lessons Learned from ENGINE and Growth through Nutrition

Eileen Kennedy, Abdulhalik Workicho, Rahel Gizaw, Meghan Kershaw, Jennifer Stickland  
Friedman School of Nutrition Science and Policy  
Tufts University

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## Acronyms

AGP	Agricultural Growth Program
DHS	Demographic Health Survey
DRDP	Dairy Rehabilitation and Development Project
ENGINE	Empowering New Generations to Improve Nutrition and Economic Opportunities
FGD	Focus Group Discussion
GoE	Government of Ethiopia
KII	Key Informant Interviews
MCH	Maternal and Child Health
MW	Model Woreda
NEW	Non-ENGINE Woreda
NNCB	National Nutrition Coordination Body
NNTC	National Nutrition Technical Committee
NNP	National Nutrition Program
NNP II	National Nutrition Program II
NMW	Non-Model Woreda
RNCB	Regional Nutrition Coordinating Body
RNTC	Regional Nutrition Technical Committee
SBCC	Social and Behavior Change Communication
SURE	Sustainable Under nutrition Reduction in Ethiopia
WASH	Water, Sanitation and Hygiene
WNTC	Woreda Nutrition Technical Committee

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## Overview

The purpose of this review is to summarize the important project learnings from ENGINE and from Growth through Nutrition thus far, and more importantly, to assess the policy and programmatic implications in order to contribute to the body of evidence available for informing current and future nutrition policy and programming.

The review will first cover operational research findings from ENGINE by describing each study and the program/policy recommendations, followed by the findings from Growth through Nutrition, organized by each study findings and program/policy recommendations. It will also look at other capacity building activities around learning and dissemination of research conducted under both ENGINE and Growth through Nutrition. Lastly it will summarize some of the ways that the research and learning activities have had a positive outcome of turning “research into action” and highlighting the way forward.

### 1.0 Introduction

The Government of Ethiopia has made a significant national commitment to improving nutrition. This is reflected in the National Nutrition Strategy, the National Nutrition Plans I and II, the Seqota Declaration to end hunger, and most recently, the proposed National Food and Nutrition Strategy. The strength of each of these initiatives has been enhanced by the evidence-based approach used by GOE in crafting these policies.

USAID has funded two large projects in Ethiopia with the overall aim of improving the nutritional status of the population with an emphasis on pregnant women, infants and preschool aged children. Empowering New Generations for Improved Nutrition and Economic Opportunities (ENGINE), 2011-2016, and Feed the Future Ethiopia Growth through Nutrition Activity (Growth through Nutrition), 2016-2021, are each five-year projects with a focus on multi sector approaches to enhancing nutrition. Both ENGINE and Growth through Nutrition were both operated by SAVE the Children Ethiopia with a consortium of local and international partners. As a partner, Tufts University held the primary role of implementing the research and learning agenda; this learning agenda was a cross-cutting agenda focused on priority technical areas that broadly fell into three main components (1) capacity development (2) operational research and (3) communication/technical assistance.

### 2.0 Project Background - ENGINE and Growth through Nutrition

ENGINE was an integrated nutrition program intended to decrease maternal, neonatal and child mortality by improving the nutritional status of women and children less than two years of age. The project focused on sustainable, comprehensive and coordinated, evidence-based interventions in four major regions of Ethiopia. In addition to Tufts University, the major partners in the learning agenda included Jimma University, Hawassa University and the Ethiopia Nutrition and Health Research Institute (ENHRI), later renamed, the Ethiopian Public Health Institute (EPHI).

Growth through Nutrition, currently still in operation, has a similar mission and is focused on the same target groups and in the same priority four major regions in Ethiopia as was ENGINE. As will be discussed below, this was not started with a blank slate, but rather was able to build on, amplify and refine many of the results that emerged from ENGINE. The links with ENGINE allowed Growth through Nutrition to build upon and leverage existing knowledge which increased the efficiency and effectiveness in addressing critical issues embedded in the project. With

The following sections will provide a concise summary of key findings from the operational research (OR) conducted under ENGINE and Growth through Nutrition. For more detail on these studies refer the list of publications in Table 1.

### 3.0 Operational Research Findings - ENGINE

The identification of priority areas for research began immediately under ENGINE. At the launch event in Oct 2011, Tufts interacted with the partner organizations to discuss the critical areas for research. This discussion was further elaborated upon at a March 2012 workshop with key stakeholders and extensive discussions with Save the Children colleagues. Through these active interactions with stakeholders, a focused OR agenda emerged. The ENGINE project initiated three flagship OR studies. These included (1) agriculture-nutrition linkages panel study (b) birth cohort study and (c) governance/policy study. The OR studies were focused on answering key questions that would be critical for the implementation of successful multi sector approaches to improve health and nutrition, particularly for pregnant women and children under two.

#### 3.1 Agricultural Nutrition Panel Study - ENGINE

The agriculture-nutrition panel study was designed to provide the opportunity to rigorously research how and why specific strategies and approaches (including co-location of multi-sectoral interventions) address the food security and nutrition concerns of women and children in smallholder households, a key target population of the GOE and ENGINE.

The study followed a sample of 1,200 smallholder agricultural households randomly selected from ten woredas in 5 regions or sub-regions where both the ENGINE and Agricultural Growth Program (AGP) were active. These households were followed over a two-year period and surveyed twice per year in the post-harvest and lean season. Data collection began in Feb. 2014 and was completed in October 2015.

The main findings from the agriculture-nutrition research OR are summarized under four categories: (1) Intrahousehold Distribution (2) Diet Diversity (3) Agricultural Commercialization and (4) Determinants of Participation in Nutrition-Sensitive Programs. Within each of these four categories the policy implications of findings will be discussed. The data from this study also supported the dissertation work of two ENGINE supported PhD students, and continues to be utilized to generate and disseminate information on nutrition interventions at all levels.

##### 3.1.1 Intrahousehold Nutrient Allocation - Results

To ensure food and nutrition security, food (calories and nutrients) must not only be available in communities but more importantly, these must be accessible at the household and individual person level. There is a very diverse literature on intrahousehold distribution of food and nutrients, indicating the importance of looking beyond just the household level in order to not overlook undernourished individuals within the household. Some data indicate that some vulnerable members women and children (particularly females) are disfavored when nutrients are distributed within a household. The agriculture nutrition panel sought to build on this area, specifically looking at key nutrients rather than energy alone and at inequity in distribution of nutrient intake according to individual need.

The results from the agriculture-nutrition study provided some counter-intuitive findings, indicating that women and children are not always subject to household nutrient inequity. On average, inequities in

protein and calories favor children over adults, and female children over male children. Inequities in iron, however, favor adult males over children and adult females. These results may be influenced by a higher consumption of milk (protein) in children and in animal source foods (ASFs) – namely meat, which is a high-quality iron source - in men. Higher female empowerment (decision-making) was protective of caloric and protein inequity within households. When there were more adult men in the household, female children had a greater odds of nutrient discrimination; higher relative male education to female was associated with lower odds of inequity between male and female children. Adult males with higher activity levels were more likely to have a disproportionate allocation of food. At the household level, increased protein adequacy was associated with greater detrimental inequity, implying that households may more equitably distribute resources when they are limited, and may favor certain members when not constrained. Overall the findings indicated that determinates of equity in the Ethiopian context are complex and not easily surmised.

### 3.1.2 Intrahousehold Nutrient Allocation - Policy Implications

One of the primary objectives of the ENGINE project was to improve the dietary intakes of vulnerable groups. A serious maldistribution of critical nutrients to women and children would undermine these goals. Traditionally programs have addressed the intrahousehold distribution of food through social and behavior change campaigns (SBCC) with mixed results. Based on findings from ENGINE on household allocation and the gender relationship with SBCC messaging, the Growth through Nutrition project responded with a SBCC pilot project conducted by The Manoff Group using a whole household approach, rather than just targeting individuals within the family.

This research made a clear recommendation to delve further into the decision-making dynamics for food allocation within households to assist policy officials and program planners to better understand the “black box” of intrahousehold dynamics and to more effectively reach individuals facing dietary discrimination and nutrition vulnerability. The agriculture-nutrition research revealed that households where females are more empowered are more likely to have an equitable distribution of nutrients. It is important to better understand specific household decision-making behaviors that lead to better health and nutrition outcomes, especially in households with greater female empowerment. This additional insight would aid in designing SBCC programming to transform cultural norms and biases in food sharing practices at the household level and protect vulnerable groups.

The Growth through Nutrition project provided an opportunity to build on the ENGINE research to better define the household decision making process to unpackage the decision-making process within households as to what crops to plant, which to sell, which to consume, and how incomes are used. See Section 4.3 for more information on these findings.

### 3.1.3 Diet Diversity & Seasonality - Results

Diet diversity in the sample of households in the agriculture nutrition study was low compared to the national averages (Hirvonen 2012), but in line with other studies including the birth cohort OR study (discussed below). The average diet diversity score fluctuated only slightly during the different seasons of the year, with lower diversity during the lean season. Despite this general finding of, on average, modest seasonality in consumption, some households were more affected than others. Production diversity (number of crops) was lower in the lean season yet expenditure diversity was relatively high across seasons. Both production and expenditure diversity were significant predictors of the household's

dietary diversity. Household diet diversity was also significantly related to wealth, social capital, living in a household with a younger head. Participation in nutrition sensitive activities increased diet diversity in the household. As expected, fasting was associated with a negative change in the household's diet diversity score.

#### 3.1.4 Diet Diversity & Seasonality - Policy Implications

Low diet diversity is a main contributor to poor diet quality, most noticeably for inadequate intakes of high-quality protein and micronutrients. Not surprisingly, low diet diversity was worse in study households with less wealth (no economic security net); thus participation in nutrition sensitive activities would be a high pay off endeavor to improve diet diversity.

Efforts to encourage households to diversify own crop production can help diet quality in the short term. This message should be a key component of agricultural extension messages and integrated into other SBCC programs. In the longer term, it is market linkages that increase the household's ability to increase and maintain diet diversity through the lean seasons. Therefore, continued support for market access and infrastructure development for market integration will be critical to ensure the seasonal stability of diet quality.

#### 3.1.5 Agricultural Commercialization and Diet Diversity - Results

Prior to the agriculture nutrition panel study, a secondary analysis of data from the 2012 Rural Socio-Economic Survey conducted by the Ethiopian Central Statistics Agency (CSA) set out to investigate if agricultural commercialization is associated with greater household dietary diversity. The study any income from crop or livestock sales as a proxy for commercialization, a definition that was inclusive of smallholder farming households, and the answer was yes. Greater income from agricultural sales, controlling for non-agricultural income, was significantly associated with greater household diet diversity. The greater the share of ag income from livestock sales, the greater the household diet diversity score (HDDS), all else equal. Households in the highest agricultural income quartile were twice as likely to consume vegetables and dairy, and half as likely to consume roots/tubers.

In addition, the production of specific food groups increased the likelihood of household consumption. Across all income levels, households that produced vegetables, fruits, pulses, dairy, and eggs had a higher chance of consuming these foods compared to households who did not. There were other factors that contributed to diet diversity; field area, female ownership of a large asset (seen as a proxy for empowerment), region, female education and wealth were all predictors of improved diet diversity. In addition, the positive effects of commercialization were greater in female-headed households.

#### 3.1.6 Agricultural Commercialization and Diet Diversity - Policy Implications

Smallholder agriculture commercialization can benefit household diet quality through the income pathway. Government programs that increase the probability of households producing agricultural goods for sale can have a powerful effect on improving diet quality. The positive effects of cash crop production appear to operate through market access. Therefore strategies to improve market access, particularly for small-holder agricultural households, can have a significant effect on improving diet quality.

Given the results of this study, programs that focus on increasing the production of high-nutrient-rich foods can lead to increased consumption of these foods, regardless of the overall income level of the household. Agricultural programs that educate and empower women to have greater control over assets and other household decision making will likely see improved dietary diversity, independent of commercialization efforts. One caveat to note is that regional variations must be considered in program design and implementation.

### 3.1.7 Participation in Nutrition-Sensitive Program Activities - Results

Not all households residing in agriculturally productive areas targeted by the AGP and ENGINE access nutrition-sensitive agricultural services. Households with less wealth, less land, less labor, fewer social connections and no male head are either not opting to or not able to benefit from nutrition-sensitive agricultural interventions. Kebeles with both ENGINE nutrition sensitive and specific interventions saw higher rates of participation than kebeles with nutrition sensitive interventions alone, indicating a synergistic impact of both sets of strategies on food security and nutrition activities.

### 3.1.8 Participation in Nutrition-Sensitive Program Activities - Policy Implications

Large-scale nutrition-sensitive agricultural interventions don't easily lend themselves to household or individual-level targeting. Projects should reconsider strategies for generating demand and outreach around activities such as farmer demonstrations and extension. In thinking about participation of households, programming must consider the opportunity costs of participation, incentives, and barriers to participation so that relatively disadvantaged households may equitably benefit from activities.

## 3.2 Birth Cohort Study - ENGINE

Poor nutritional status during pregnancy and pre-pregnancy are significant determinants of birth outcomes. In Ethiopia, maternal mortality is high, at 41.2 deaths per 100,000 live births (CSA E/ICF, 2016). The ENGINE birth cohort study was designed to generate rigorous learning on key questions and innovative policy and operational approaches that would support the successful scaling up of programs to improve nutrition in Ethiopia as outlined in the first National Nutrition Plan.

The birth cohort study evaluated the effectiveness of direct and indirect interventions targeted to maternal and child health outcomes. This was a prospective, observational birth-cohort study that provided the opportunity to rigorously understand how and why specific strategies and approaches (including co-location of interventions) address nutrition and health concerns of vulnerable groups of women and infants. The research questions for this ENGINE research component were developed in a consensus process with Ethiopian stakeholders. The research questions required ENGINE to use a longitudinal study design as the Ethiopian stakeholders wanted to examine the patterns of linear growth and to understand the determinants/risk factors during pregnancy and in the first year of life. The longitudinal design allowed the study to assess causality and/or the direction of the relationship which would not have been possible to examine using a cross-sectional study.

A total of 4,680 women were recruited during the second or third trimester of pregnancy, and followed until their children were approximately 1 year of age, with follow-up visits approximately every 3 months after birth. Data was collected on domains including socio-economic status, household food security,

maternal dietary recall, food taboos and consumption patterns, household agricultural production, health status of the pregnant woman and child, and child caring practices, among others.

The results from the Birth Cohort Study are presented in the four categories to follow, with a final section discussing the policy implications of the findings.

### 3.2.1 Birth Cohort Study - Results

#### Factors Associated with Nutritional Status in Pregnancy

Analysis from ENGINE research found that maternal height and BMI, birth size, infant diet diversity, specifically consumption of ASF, household wealth, access to services, water, hygiene and sanitation were significantly associated with stunting in infants and children up to age two. Pregnant women in this study might be considered high risk; the prevalence of anemia and low mid upper arm circumference (MUAC), an indication of preconception weight and low pre-pregnancy weight, were high in the study population. The prevalence of altitude-adjusted anemia in the study population was 24%, a rate similar to the country wide rate in 2016 of 24% (CSA E/ICF, 2016). Over 40% of the women had a low MUAC, a clear sign of under nutrition.

Women who had multiple pregnancies were more likely to be anemic (50% more likely) whereas women with better hygienic practices (high hand washing score) and higher numeracy were 10% and 30% less likely to be anemic. Anemia and low MUAC in pregnancy are correlated; anemic women were 35% more likely to have a low MUAC, indicating multiple nutrition problems simultaneously. Low food security and a greater distance from the health clinic were associated with poor nutritional status in pregnancy. Individual WASH practices, wealth and maternal education are protective of nutrition in pregnancy. Young age at pregnancy was a very significant predictor of poor birth outcomes.

#### Diet Diversity in Pregnancy and Women of Reproductive Age

Diet diversity was low in pregnancy with an average of 2.4 food groups consumed, significantly lower than the recommended five or more food groups per day. The diet diversity score during lactation was 3.4 with only 15% of women consuming 5 or more food groups. Seasonality had a direct effect on the nutritional status of women, with households turning to staple foods such as roots over more nutrient-dense foods in the lean season. Women in the study who were recruited during the lean season were at higher risk of a low MUAC.

#### Utilization of Health Services and Nutrition Messaging

A primary objective of ENGINE was to improve access and utilization of health services by pregnant women, including delivery in a health facility, increasing the number of women using antenatal services and a higher percentage meeting the recommended number of clinic visits throughout pregnancy. Women were the primary targets of nutrition messaging, primarily through the health sector. The specific messages ranged from information on exclusive breastfeeding, complementary feeding and dietary diversity.

The study finding on use of health services during pregnancy was not optimal. Fifty two percent (52%) of women did not take iron/folate supplements; this is compared to the national average of 58%. Only 5.2% took deworming medications (national average 6%). In the ENGINE study, 44% of all pregnant women (40% of those under 20 yrs old) met the recommended four health care visits; the average

number of health visits was 2.9. There were, however, a small number of women - 9.8% - who received home visits from health extension workers. Worth noting, both women who visited a health facility in the last year and women who reported receiving visits from a health worker lived significantly closer to a health facility than those women who did not. (This continued to be a challenge in Growth through Nutrition Activitiy especially during rainy season making health services less accessible mainly to women and children under the age of two).

#### Association of maternal nutrition, birth outcomes and linear growth

In the birth cohort study, maternal MUAC and height were found to be positively associated with birth length, weight and length-for-age z-score in infants. Maternal anemia, however, was not found to be a significant predictor of any of the birth outcome indicators. The prevalence of stunting at birth was found to be higher than was the prevalence of low birth weight overall. Low birth length, as reflected in stunting at birth, is a function of maternal nutrition before and during pregnancy and is a marker of intrauterine growth retardation. The linear growth patterns of infants were associated with maternal MUAC, maternal height, maternal diet diversity in pregnancy, gestational age, birth weight and birth length, suggesting that improvements in maternal nutrition affect the linear growth trajectory of their offspring.

#### 3.2.2 Birth Cohort - Policy Implications

Maternal nutrition during pregnancy is critical for optimum birth outcomes. Equally important, and often overlooked, is the essential impact of pre-pregnancy nutritional status for subsequent health and nutrition of infants. The pre-pregnancy health and nutritional status of adolescents is particularly significant in promoting the health of newborns. Yet, until recently, teenagers and women in the preconception period were given less attention in targeting health and nutrition services. A major barrier to promoting health and nutrition prior to pregnancy is the lack of a specific platform for reaching this target groups. Once females have left school, providing access to health services in the preconception period is challenging. Innovative methods for reaching females prior to pregnancy is essential in order to break the intergenerational cycle of malnutrition.

While progress is being made in Ethiopia to reach pregnant women, early and often, more needs to be done. One possible strategy is a very focused SBCC campaign for women who intend to become pregnant and women in the early stages of pregnancy as well as their spouses.

The use of iron/folate supplements was low in the study population. The Growth through Nutrition focus on distribution of iron/folate supplements is a key part of the essential nutrition services being provided by the project. Innovative ways to increase the uptake of the iron/folate supplements need to be developed and tested including targeting adolescents.

Dietary diversity in women was low during pregnancy and lactation. It is not entirely clear why this was so, and due to low variability in the data set it was not possible to adequately compare those who met or did not meet minimum diet recommendations. Data from the birth cohort study on food restriction during pregnancy did not show a consistent pattern. In order to better inform policy and program design, it is important to ascertain whether the poor diet quality is a function of access, education or other non-nutritional factor. This new information is critical for the appropriate targeting of nutrition

services to this at-risk group. These data are needed to better understand the complementarity of nutrition specific and nutrition sensitive policies and programs.

Water, hygiene and sanitation are significant factors in influencing healthy birth outcomes. Water was not a sector highlighted in the ENGINE project; the Growth through Nutrition project, however, has built on the results from the ENGINE research and placed more emphasis on WASH marketing activities providing the opportunity increase access and usage of WASH services at the household level.

Seasonality does affect maternal nutritional status during pregnancy and subsequent birth outcomes. More mechanisms for coping with dietary patterns in the lean season need to be identified and tested. There is a clear role for innovative nutrition sensitive agricultural strategies to smooth food intake during lean periods to obviate the negative impacts on diet diversity. The current Growth through Nutrition focus in implementation of post harvest technologies is promising, but needs to be scaled up by including technologies that could be implemented at household level.

Distance to services is a barrier to regular participation in health services. Innovate methods for reaching women who are further away from health facilities need to be developed and tested. One example would be the use of mobile health at the kebele levels. While there are indications of community approaches that have been successful, more emphasis needs to be placed on building capacity at the community level. Of concern is the low utilization of services by adolescent pregnant women and mothers. This calls for health services to incorporate more adolescent friendly services tailored to the demands and needs of adolescent women/girls.

### 3.3 Governance-Policy Research (ENGINE)

Success of the GOE multi sector nutrition plans rests heavily on the ability to effectively implement activities at the national and subnational levels. This, in turn, is dependent on an effective governance structure. The concept of good governance is not new. For example, the 2008 and 2013 Lancet Series on Maternal and Child Nutrition emphasized governance as essential for the effective implementation of both nutrition specific and nutrition sensitive approaches. The policy/governance study conducted under ENGINE was one of the first to document the opportunities and challenges in launching a multi-sector plan to improve nutrition.

Policy officials were interviewed at the national and sub national levels. The OR research was conducted in collaboration with EPHI, formerly ENHRI. Key informants were interviewed from government, academia, civil society and donor groups. Interviews were conducted from June to August 2013.

#### 3.3.1 Governance-Policy Research (ENGINE) - Results

The governance study was conducted in the early stages of implementation of the first National Nutrition Plan (NNP). Not surprisingly, awareness of the plan was mixed. At the national level, it was the ministry of health and agriculture who were most aware of the specifics included in the plan. However, even in other ministries with lower awareness of NNP 1, there was a palpable level of enthusiasm about the potential for what the multi sector plan might accomplish. The level of awareness about the NNP was significantly lower at the subnational levels, hindering the specific approaches that were launched at the regional and woreda levels.

At both the national and subnational levels there was a general agreement on the nature of the nutrition problems in Ethiopia. This was an important starting point since there was agreement on the priority targets for policies and programs. The dominant problems identified were stunting and micronutrient deficiencies.

At all levels, the major constraints to implementation of the NNP were loose coordination, lack of incentives for collaboration, inadequate attention to nutrition, budget constraints and the need for more trained professionals.

At both the national and subnational levels there was the perception that, despite an emphasis on a multisector activity, the NNP was viewed as essentially a Ministry of Health (MOH) Initiative. This perception was a major hindrance to encouraging cooperation or collaboration across ministries.

### 3.3.2 Governance-Policy Research (ENGINE) - Policy Implications

It was not surprising that there was a low awareness of the NNP given that the plan was in the early stages of implementation. There was, however, no doubt that the limited awareness of the NNP was one significant reason for the lack of implementation of specific policies and programs at all levels. If policy officials and program implementers do not know about the GOE multi sector priorities, it is unlikely that changes in the orientation of activities, particularly at the local level, will occur.

The other challenges identified at the local level called for a specific “road map” for implementation. This implied more specific guidance on who does what, with whom, and at what type of interactions across sectors. Interestingly, budget was not listed as the most limiting constraint for success of the NNP.

In order to reorient the perception of the NNP as a truly multi sector activity rather than simply within the domain of MOH, a different oversight mechanism was suggested that would reflect an equality of “ownership” for success of the plan. This oversight mechanism is similar to the new structure in the national Food and Nutrition Policy, where all 13 sectors report and are accountable to the office of the Prime Minister. This will help to ensure broad, multi-sectoral implementation, coordination and monitoring mechanisms, provide a forum for an integrated response to nutrition issues.

The closing of the NNP and development of the NNP II also provides the opportunity for additional follow-on research to look at the growth and expansion of knowledge and implementation of the national plans.

## 4.0 Operational Research – Growth through Nutrition

The Growth through Nutrition project did not start with a blank slate in developing the operational research agenda and rather was able to build upon the rich, extensive data that were available from the ENGINE studies. As always, the Tufts team engaged in active collaboration with partners and stakeholders to develop the project learning agenda strategy, including the identification of high priority research topics. Other activities that contributed to this exercise included a desk review of relevant national policy documents related to nutrition and WASH, a landscape analysis study and report, and a culminating Learning Agenda Design Workshop in Feb 2017 in Addis Ababa. After this extensive consultative process three studies were prioritized to Year 1: (1) policy/governance follow up study (2)

household decision making related to production, consumption and sales of agricultural commodities (3) impact of SBCC communication interventions in nutrition specific and nutrition sensitive interventions on selected indicators of nutrition status.

The modus operandi for conducting the OR studies in Growth through Nutrition differed from the approach used in ENGINE. Because of the wealth of information available from ENGINE, the strategic learning agenda for Growth through Nutrition directed the identification of topics to focus on responding to gaps in knowledge that had previously been identified from ENGINE and on questions that may arise during project implementation. An emphasis was placed on study designs that could be carried out relatively quickly so that the information from the research could be fed back into the on-going Growth through Nutrition activities.

#### 4.1 Multisectoral Coordination Study

##### 4.1.1 Multisectoral Coordination Study - Results

Growth through Nutrition had the opportunity to assess progress at the woredas level in factors associated with the successful implementation of the GOE, multi sector nutrition plan. While the woredas in the follow up study differed from ENGINE, the research was able to revisit the same regions as in the earlier study. A similar research protocol was used in both studies. The results from this repeated cross-sectional design provided a powerful method to evaluate changes over time in key parameters essential for effective implementation of the NNP.

The Growth through Nutrition study was conducted approximately four years after the original ENGINE governance study. In the later period, the Growth through Nutrition OR data indicated that more respondents at the woreda level had been consulted on the multi sector plan, There is a dramatic difference in the level of awareness about NNP I and NNP II; under ENGINE between 25% to 83% of individuals had no awareness of the NNP; in the Growth through Nutrition research this lack of awareness had plummeted to 2.8%. This may not be particularly surprising since the multi-sector plans were now more well established than in the earlier 2012-2013 period.

Attention to nutrition was perceived to be low in the original research with anywhere from 25% to 44% reporting this as a problem for the multi sector plans; this number dropped dramatically to about 12% in the later period. Similarly, difficulties in collaboration and coordination had diminished over the four-year time period.

Overall, comparing the two time periods, the results indicate significant progress in awareness, ownership, collaboration and collaboration in the later time period.

##### 4.1.2. Multisectoral Coordination Study - Policy Implications

Policy officials who were interviewed at the woreda level were clear that although progress has been made on many dimensions, this progress, they believed, would not be maintained without sustained efforts to keep nutrition on the political agenda. Related to this comment was the concern that priorities change as the political landscape changes; there is a constant need to identify strategies, including advocacy, to keep nutrition high on the political agenda. Champions at the highest levels of government will be needed to achieve this goal.

Implementers articulated a need for a specific road map to be developed on what each sector is expected to do. This was also a concern four years earlier. While multi sector is the model, each sector acts independently to contribute to success.

A dominant theme that emerged from the government key informants was that in order to maintain and build on progress, there needs to be a continued high-level support for nutrition. Many people added, maintaining momentum does not happen by accident, but must constantly be refreshed.

## 4.2 Social and Behavior Change and Communication

### 4.2.1. Social and Behavior Change and Communication - Results

Social and Behavior Change and Communication (SBCC) strategies are emphasized in many multisector plans. These SBCC efforts can be stand-alone approaches or as an essential component of larger, multi programs. The need for more clarity on SBCC was articulated in the Feb. 2017 workshop as critical since the evidence as to effectiveness was perceived as weak, mixed or in some cases nonexistent. To address these gaps Growth through Nutrition launched an OR focused on an assessment of SBCC as part of nutrition sensitive and nutrition specific programs. There were three questions guiding this research: what works, under what context, and at what cost?

An extensive literature on nutrition specific and sensitive SBCC was reviewed. There are examples of where SBCC has effectively improved diets, or nutritional status. However, the overall body of evidence reviewed indicates that the effects of SBCC efforts, in general, have had nonsignificant effects on the outcomes of interest. These two apparently contradictory findings require further explanation. This negative conclusion of no impact cannot be interpreted as a null effect, but rather an observation that programs, as implemented, have not been successful in reaching the stated objectives.

Fortunately, there is evidence on factors or components that are needed to increase the probability of improving diet, nutrition and health. First, the metric(s) used for evaluation needs to be specific to the interventions that are put in place. This seems so obvious that it does not warrant being mentioned. There are a wide variety of indicators that are appropriate for monitoring and evaluation of approaches. Yet despite this menu of indicators, until recently, there has been a disproportionate emphasis on stunting as the primary outcome of SBCC. The indicator used for evaluation should be specific to the objective of an intervention. For example, judging a short-term agriculture intervention aimed at increased consumption of nutrients based on a diet diversity score is a more appropriate metric to use rather than longer term indicators like stunting .

This is a vast void on any published data on the cost of implementing SBCC interventions. This limits the ability to compare SBCC as a stand alone interventions to one where SBCC is part of a multi facted approach. The lack of cost data preclude comparing SBCC to other interventions that are focusing on the same objective(s).

### 4.2.2 Social and Behavior Change and Communication - Policy Implications

SBCC campaigns are an important part of changing food and nutrition behaviors. SBCC programs can be the fulcrum for effective behavior change interventions. There are four key factors that influence the success or failure of SBCC. First, the messages presented need to link to a specific behavior. For

example, a message like “consume a nutritionally adequate diet” is so vague as to be almost useless. A more effective message would be increase consumption of fruits and vegetables.

Second, the SBCC OR concluded that there is a dose-response effect that must be considered; this means that one encounter, in whatever form, is unlikely to be successful in changing behavior.

Third, the use of multiple media is more effective than one approach alone (see discussion of the virtual facilitator below).

Finally, even if the intent is to reach women or children, SBCC efforts targeted to the household may be a more effective strategy for changing behavior. These four factors should be an essential part of designing and implementing SBCC interventions.

### 4.3 Household Decision Making

A clear recommendation from the Agriculture & Nutrition Study conducted under ENGINE was the need to better understand the household decision making process related to what crops to produce, how much to sell and how much to consume. To address this void, a study was launched to examine the factors, both positive and negative, that influence a household’s decision to produce, consume, purchase or sell nutrient rich foods. This OR study concentrated on fruits, vegetables and animal source foods specifically. Since the Growth through Nutrition project concentrates activities on model farmers and most vulnerable households(MVHH), these were the two groups targeted in this study. Focus group discussions and interviews with key informants were used to collect data on household decision making to identify the major barriers and motivating factors in the production and consumption of healthy foods. This study was a collaboration with Land O’Lakes, another partner in Growth through Nutrition responsible for the livelihoods component of the project.

#### 4.3.1 Production and Sale - Results

From the study findings, some general statements can be made about the factors that were found to influence the production, retention, sale and purchase of nutrient dense foods.

Two considerations seemingly dominated the household’s decision-making process related to crop production, the cultivation of staple crops for home consumption (mainly as a safety net for food security) and the production of cash crops (primarily for disposable income) drive the household’s agricultural strategies. Primarily it is only when households have met their basic consumption and cash crop needs that excess land is used for production of nutrient rich foods.

Information from this study also showed that vegetable and animal production have historically been negatively affected by insect damage, water shortages, soil type and/or access to agricultural inputs. Households also perceive the demand for such crops to be more unstable and have concerns about marketability. Certain areas also lack appropriate conditions such as quality soil and adequate water for irrigation which can negatively affect production. Thus households perceive that vegetable and animal production are more risky endeavors than staple crops. The cultivation of basic staples is still seen as the safe strategy to protect household food security.

The financial status of the household dominates household decision making around food production. Not surprisingly, wealthier households tend to be less risk averse and are often the early adopters of novel crops and livestock cultivation. This is usually because they are able to access the inputs needed to

make production more successful, as well as access to enough land to meet more than just their basic consumption needs. Additionally, poorer households reported not being able to rent land because the rentors do not trust them to be productive on the land and pay the rents.

Households who have received both knowledge about the benefits of nutrition sensitive agriculture as well as inputs like animals or seeds have seen some success in their production. Women in the MVHH households who received support in the form of improved seed varieties and assistance in the rearing of small animals were more predisposed to cultivating nutrient rich foods.

For the households who do produce healthy foods, for the most part this is done on a small scale and is used primarily for own consumption due to the perishability. There is also a perception that the demand for such products in the market is very low because households prioritize using income to purchase other household items that they can not produce themselves such as coffee. Thus the sale of crops produced is facilitated by enhanced market access.

Decisions to sell produce at market are negotiated within households. In general, however, it is husbands who normally decide which products should be sold or retained. This is particularly true for the sale of high market value products such as animals, animal products and cash crops, since the decision to retain or sell items may have a significant impact on household income.

#### 4.3.2 Consumption through Retention and Purchase - Results

Unlike decisions on what to sell, decisions about what to consume in the household is primarily led by women. The decision to retain household produce is thus shaped by the taste preferences of family members, the knowledge base of mothers with regard to food preparation and diet diversification, the magnitude of household crop production, and the financial needs of the family which may warrant the sale of lucrative crops. While decisions about purchase of foods at market may be initiated by women, oftentimes the husband will need to be consulted for higher priced items.

Despite the increased educational outreach, non-staple items including fruits, vegetables and animal products are primarily considered a luxury, resulting in less interest in purchasing and consuming these foods. Optimizing caloric intake to quell hunger year-round was emphasized first as the motivating factor in a households' food consumption patterns. Most of the respondents in this study ranked the healthiness of foods as very low in their propensity to produce, consume and purchase these products at market, although there was some indication that this was slowly beginning to change for the better in some areas. Women from model vulnerable households have begun to feed their children fruits and vegetables since they believe that these products will help their children grow stronger; some of this improvement appears to be related to the SBCC efforts of Growth through Nutrition

Although some households did produce and consume some nutrient dense foods, they often did not purchase any additional foods when their own production ran out, even if they enjoyed it. In some cases, long travel time to-and-from markets hinder households from purchasing market items frequently. Even when travel to the markets is feasible, many items may not be available for purchase. Furthermore, since milk and vegetables perish easily, it is impossible to store them for long periods of time—making consumption of many nutrient-rich foods heavily infeasible once products are out of season. Overall, households report a low willingness to pay for ongoing consumption of healthy foods like vegetables and fruits when access to such products is limited and prices are inflated.

### 4.3.3 Household Decision Making - Policy Implications

Decision making within households related to production, sale, purchase and consumption of food products is complex. The decisions of households are rational and aimed at ensuring food security, economic stability, and minimizing risk. There are various points along the production to consumption continuum where interventions could influence decision making and improve food security and nutrition.

For vulnerable households to adopt newer agricultural strategies it is imperative that basic food security be assured. Thus, the GOE Agricultural Growth Programme targeting increased efficiency in production is an essential first step to ensure food security; the adoption of novel crops and/or change in a household's production strategy must be based on an assurance that food security will not be compromised. Alternatively, incentives to produce nutrient dense crops can be employed in tandem with broad based agricultural growth policies. Growth through Nutrition, by providing inputs to support fruit and vegetable and/or assistance in small animal rearing, has shown promise in migrating vulnerable households to a more varied mix of crop cultivation and animal production.

Efforts should be made to help mitigate real and perceived risk for household in adopting nutrient rich food production, including access to knowledge, support and inputs. Often word of mouth about risk faced by others may deter new farmers from adopting practices so it is important to build trust between implementer and beneficiary households, and to ensure that an adequate security net exists when challenges do arise. Additional activities and training including related to post-harvest processing had help to create confidence in ability to alleviate risks from spoilage and other post-harvest loss. Greater dissemination of best practices, demo days and visits to model farmers may also help to build confidence and knowledge around successful production of nutrient rich foods, leading to increased adoption.

Local knowledge and cultural attitudes influence both production and consumption decisions. Cultural changes often occur slowly over many years, but SBCC strategies can be an effective tool to changing and informing traditional attitudes and practices in a relatively short period. As discussed in the findings from the SBCC reviews, the specific behavior to change must be identified and relevant messages developed and delivered. Having what one commentator called a "garbage can dump", meaning multi messages in a single encounter, is doomed to failure. For example, to change the attitude of households from viewing nutrient dense foods as luxury, to a perception that these foods are essential for good health and well-being, one set of messages would be appropriate. However, if the goal of SBCC messaging instead is to migrate households to produce cash crops, a different set of messages would be required. Even within a thematic domain – child feeding, crop production, animal rearing – there often is a need to modify messages to the local context. In essence, a "one size fits all" approach may not be effective. The study did in fact, find that some of the determinants of decision making did vary by region.

In addition to context specific messaging around the importance of nutrient dense foods in the household diet, expanding the targeted audience of this messaging may also be an effective approach. Traditionally SBCC projects have targeted messages to women or mothers. Given the results from the OR research, a whole household approach for messages may be more appropriate than limiting programs to only one individual within a household.

#### 4.4 Quality Improvement Study

The GOE has adopted a national policy on healthcare quality and introduced several initiatives aimed at improved quality of health services at all levels of the health system as a major strategy for improving the health and nutrition of women and children. Growth through Nutrition has been providing technical and financial support for implementing Quality Improvement (QI) measures for nutrition interventions at health centers and health posts within the project areas. This study assessed the role of QI initiatives in improving quality of health and nutrition services in targeted PHCUs and identify factors influencing implementation of Growth through Nutrition supported QI initiatives. The study was conducted at PHCUs in four regions targeted by Growth through Nutrition. A random sample of PHCUs supported by the Growth through Nutrition QI component were included. Quantitative data were collected from 22 health centers and 21 health posts.

##### 4.4.1 Quality Improvement - Results

Main findings from the study indicate that quality improvement models have been effectively introduced in project supported health centers and posts, however institutionalization is still at an early stage. All of the PHCUs reported receiving training for their technical staff, and several HCs also reported receiving additional support on QI from other organizations. All study health centers had established quality improvement teams and assigned quality improvement focal persons. Model for Improvement, one QI approach, was implemented in 90.9% of health centers and 38.1% of health posts. Implementation of MFI was relatively better in HCs than HPs; implementation at HPs was very low in coverage and inadequate in intensity. Kaizen was implemented in 95.5% of HCs and 95.2% of HPs. Progress towards implementing Kaizen as a daily routine was in general higher for initial steps with relatively lower achievement in the areas of standardizing and sustaining.

The functionality of quality improvement teams – including holding meetings, regularity of meetings and use of meetings to measure or improve quality of care – was positive in the majority of the health centers during the last year, with 32% of HCs and 29% of HPs holding meetings within the last month. Overall, the full complement of QI measures was more successful in health centers compared to health posts. Aggregate data showed that 14 of the HCs have improved quality of care through MFI. A key barrier to implementation of QI processes is the attitude on the part of some staff that this was an extra task. In addition, teams in health facilities repeatedly mentioned that many of the root causes of nutrition require actions beyond their control.

##### 4.4.2 Quality Improvement - Policy Implications

Progress has been made in implementing QI measures, efforts were similar for Kaizen but MFI initiation was more successful in health centers compared to health posts. Based on this finding, intense efforts must continue to be made in supporting QI procedures. More attention should be given to a monitoring system that allows timely assessment of the implementation progress, as well as standardizing documentation for both Kaizen and MFI. Greater engagement from supervisors including making QI a priority and including QI in the formal roles and responsibilities of healthcare workers could also contribute to strengthening implementation. Attention to QI at the woreda level is needed to provide adequate support and to help address issues that are out of the PCHUs control.

Health Posts were less successful in implementing MFI due to limited attention given to MFI and lack of simplicity in MFI approach for implementation at HPs given the limited support/mentorship HPs receive from HCs. Strengthening the link between Woreda Health Office and Health Centers as well as strengthening link and support from HCs to HP are critical to improve MFI implementation both at HCs and HPs respectively. Developing a simplified approach for MFI at HP level should be prioritized for the future.

Lack of basic equipment and supplies was an important determinant of the quality of nutrition interventions. It will be important that this limitation are addressed before considering the model for improvement as a solution. Linking Kaizen as a preparation for MFI can also be considered as a strategy.

As noted in this research, MFI focused only on the technical aspects of care. Client's perspectives did not get adequate attention in the identification of problems nor on the design of alternative solutions. It is also recommended to involve community members in the process of identifying gaps in quality of care.

#### 4.5 Virtual Facilitator Study

As a part of the program strategy for promoting optimal nutrition, WASH and agriculture behaviors, Growth through Nutrition has distributed social and behavior change messages via a variety of methods. One method is via Enhanced Community Conversations (ECCs), which are regular in-person group meetings facilitated by a trained professional that promote the adoption of nutrition-related skills, behaviours and gender transformative roles, help people make positive changes within the contexts of their household and family environments, and use more interactive methods and activities to help adults learn and adopt new behaviours. More recently, a new tool designed to complement the ECCs called the Virtual Facilitator (VF), a pre-recorded audio message with actors modelling the desired knowledge and behaviours, is anticipated to make the SBCC program more robust and scalable. This study was designed to test the additional value of adding the VF to the ECC program improving IYCF practices and nutritional status of women and children compared to the ECC program alone.

##### 4.5.1 Virtual Facilitator - Results

Information from this study indicated that although improvements were seen in from baseline to endline in both intervention groups, the significant changes attributed to the addition of VF include: increases in the duration of iron-folate supplements for pregnant women (13.6%), increase in handwashing facilities in the household (14.3%), increased use of soap/ash for handwashing (9.7%), use of separate space for livestock (14.5%) and an increase in joint decision making on use of agricultural products (12.3%).

Other positive effects, although not statistically significant, included improved child minimum diet diversity and minimum acceptable diets and women's diet diversity. Similarly, there were improvements in joint decision making on husbands' income (3.6%), responsibility on to raise small animals (6.1%), using the animals (3%) and decreased workload (8.4%) due to the intervention. Regarding women communication with their spouses, the study identified that there were 5.2% and 5.7% increments in women discussing about nutrition with their husbands and self-initiating the discussion respectively. Compared to the baseline report, seeking approval from husbands or anyone in the household has also decreased by 6.3% due to the intervention.

##### 4.5.2 Virtual Facilitator - Policy Implications

The positive impacts noted from this study strongly suggests that the use of VF should be extended throughout Ethiopia as a modality to transmit standardized nutrition messaging in combination with ECC. Special emphasis should be given on the areas that VF has shown to drive greater change.

Longer term follow up is recommended to see if there is any better long-term retention of adopted behaviors due to the VF tool, compared to ECC alone.

## 5.0 Small Grants Program – Growth through Nutrition

The Growth through Nutrition learning agenda also included a small grants program as a component of the research activities for the project. The small grants provided a mechanism for very focused, short-term studies on important issues, while also supporting the improvement of local research capabilities in Ethiopia. The goal of the small grants program is to both help build experience and capacity of local researchers and contribute evidence to the project’s learning agenda. The priority topics for small grants were driven largely by learning agenda recommendations which emerged from the ENGINE and Growth through Nutrition ORs and input from stakeholders. Some findings from these research studies are summarized below.

### ***5.1 Harnessing Women’s Empowerment in Agriculture to Improve Nutritional Status of Mothers, Children and Adolescents in Rural Ethiopia.***

***Research Team: Mesekerem Jisso (PI), Tizalegn Tesfaye, Dr. Taddese Alemu – Hawassa University***

Increasing women’s empowerment in agriculture has important multiplier effects on improving the health and nutrition of children. This study examined the level of women’s empowerment in agriculture and its relationship to the nutritional status of children (6-59 months), adolescent girls (10-19) and mothers (15-49) in rural, cash crop producing, limited resource areas of Ethiopia.

Women’s empowerment in agriculture was low, with only 3.5% of women found to be empowered for all five domains of empowerment that were assessed using the A-WEIA. This is a very low score, even when compared to other developing countries. Women’s empowerment was slightly higher in decision making on production (65% empowered), with other three dimensions scoring a little above or below 50%. The lowest scored domain was for time/workload (18.2 %).

#### **Policy Implications**

Women’s empowerment should be viewed from all five components; programs with a multi-dimensional approach to empowerment have a better chance of improving nutritional status of women, children and adolescents. Education, communication, and life trainings are also important aspects in empowering women. While the study found good views and understanding around female empowerment, some work is still needed to shift cultural norms and practices around female empowerment and gender roles in the household.

For women who are disempowered in all five components, especially time allocation, findings show that program interventions should involve the introduction or scale up of energy and time saving technologies and increased male involvement to help alleviate women’s workloads in and out of the house. This frees up time for better child caring and feeding practices which can lead to improved health

and nutritional status of children. In addition, while empowering women for decision making on household income is important, it needs to be accompanied by increased knowledge on nutrition, child feeding, and caring practices to ensure that it contributes positively to improving the nutrition status of children, mothers and adolescents.

Adolescent nutritional status is seen to be significantly affected by disempowerment of women's in agriculture, particularly their decision-making capacity on production. As such, work to support adolescent nutrition should also pay attention to women's empowerment in joint decision-making over food and cash-crop farming, livestock.

## ***5.2 Assessing barriers of nutrition service utilization, anemia status and associated factors among adolescent girls in Southern Ethiopia.***

***Research Team: : Yoseph Halala (PI), Dr. Kaleab Baye, Prof. Tefera Belachew – Addis Ababa University***

### ***5.2.1 Low Dietary Diversity Score and its Determinants Among Adolescent Girls in Southern Ethiopia.***

The main objective of this study was to assess the diet diversity score among adolescent girls in Southern Ethiopia. The study sample was 843 adolescent girls, and diet data was collected using a 24 hr recall. In the study, diet diversity was found to be low, with 72.4% of adolescent girls having a score less than 5 (mean of 3.56). The determinants of a low diet diversity score included household income, parent's education, not taking nutrition education classes and lack of decision-making power of the mother. Recommendations include focusing on low-income families, increasing education opportunities for adolescents, utilizing HEWs to offer adolescent nutrition messaging to households, and working to encourage joint decisionmaking in the household on nutrition and health decisions.

### ***5.2.2 Low Blood Hemoglobin Level and its Determinants Among Adolescent Girls in Wolaita and Hadiya Zones, Southern Ethiopia.***

The objective of this study was to assess anemia status and associated factors among adolescent girls in South Ethiopia. The mean ( $\pm$  SD) blood hemoglobin level of the study participants was  $12.23 \pm 1.16$  g/dL, 37% of the study participants are moderately anemic (Hb 7-12g/dl), 0.2% of the study participants are severely anemic (Hb < 7g/dL). Overall prevalence of anemia was 37.2% among adolescent girls in the study area, which falls in the WHO definition of a moderate public health problem.

Family monthly income, illness with cough and malaria in the past two weeks, skipping regular meals and BMI for age were the main predictors of anemia among adolescent girls in the study area. Community based IFA and deworming supplementation should be implemented for adolescent girls to help those at risk of anemia. Malaria prevention programs may also help, as well as livelihood programs to increase household income. Collaboration between health and educational sectors is recommended to provide nutrition education and improve meal patterns.

### ***5.2.3 Undernutrition and its determinants Among Adolescent Girls in Wolaita and Hadiya Zones, Southern Ethiopia.***

The overall objective of this study was to assess the nutritional status of adolescents and its determinants. Study subjects were young adolescents with an average age of 14.6 years. The study

showed that almost one fifth of adolescent girls were moderately thin, 8% were severely thin and 7.8% and 1% of the adolescent girls were moderately and severely stunted, respectively. Only 0.4% of the females received iron folate supplements and 60.5% reported skipping meals. The body mass index of girls was significantly associated with age (younger adolescents (10-14 years) almost 3 times more likely to be malnourished than older adolescents (15>= years), family size and monthly income, use of deworming tablets, education of the father, skipping meals, and home visits by health extension workers. Stunting of adolescent girls was significantly associated with household decision making on nutrition services and hand washing practices of adolescents. Adolescents in households where parents make joint decisions are 2.5-2.6 less likely to have stunted adolescents as compared to household with a sole decisionmaker on nutrition services. In addition, adolescents not washing their hands before eating and after using toilet were 2.3 more likely to be stunted as compared to adolescents with improved hand washing practices.

While the increased focus of Growth through Nutrition on improving adolescents nutrition through school interventions and other platforms is encouraging, more needs to be done to improve girls nutrition education/ counseling provided at health facilities and home visits by Health Extension Workers. Services at health facilities need to be improved to become more adolescent and youth friendly and tailor their services to meet the demand and needs of adolescents. As also seen in SBBC Virtual Facilitator it is important to focus hand washing practices at critical times and possibly prioritize hand washing practices before eating and after using toilet where there is limited access to water. Empowering women on various decision making areas including nutrition services is important as shared decision making at household level on health and nutrition services etc seem to lead to better outcomes for their children.

### ***5.3 The Effect of Nutrition Education Intervention Using Health Belief Model on Diet Diversity, Nutritional Knowledge and Nutrition Status of Pregnant Women in Rural Kebeles of Dessie City Administration, Northeast Ethiopia: Cluster Randomized Control Trial.***

The overall objective of this research was to measure the effect of nutrition education intervention on dietary diversity, nutritional knowledge and nutritional status of pregnant women in rural kebeles of Dessie, Ethiopia. A cluster randomized control trial design was used with 64 women in the intervention and 63 in the control group. Nutrition education using a Health Belief Model was used to provide sessions to women every two weeks for three months for the intervention women. There were positive, significant differences between women receiving the nutrition education compared to women in the control group; nutrition knowledge, dietary diversity, and WASH practices improved under the health belief model. There were significant differences in nutritional status in the intervention group where the percent of women with low MUAC went from 28% at baseline to 7% at the end of the study period.

## **6.0 Capacity Development Activities under ENGINE and Growth through Nutrition**

Capacity development involves a complex web of approaches. Indeed, the literature on capacity building uses different metrics to assess success in capacity development including degree granting programs, short term training, certificate programs, on the job training, individual tutoring, mentoring, to name a few. A stakeholder workshop was convened in March 2012 to garner input from a wide range of stakeholders to help craft the capacity building and research agenda for ENGINE. Based on this input

and discussions with SAVE the Children, the ENGINE project concentrated on launching a doctoral program in nutrition; the program was a collaboration between Tufts, Jimma University and a range of academic institutions in Europe. The program was supported by Tufts, while the actual conduct of the academic program involved a collaboration between Jimma University and European institutions. Eight candidates entered the program under ENGINE. The majority of candidates used data collected in the ENGINE studies for their dissertation research.

Early evaluations from a range of donors who had funded capacity building efforts in the 1980s and 1990s noted two common problems with the outcomes of degree granting initiatives. First, there was what has been termed, “brain drain”, that is, once a person received higher education these people were often siphoned off by higher paying organizations, including United Nations agencies. A second problem, identified by those who were awarded a higher degree, was that they went back to their host institution with no opportunity to apply their enhanced skills and/or no opportunity for career advancement. The ENGINE PhD program sought to address these concerns through ensuring job opportunities for local advancement.

Three individuals who completed their PhDs from this program under ENGINE so far illustrate some of these successes:

- Dr. Abdulhalik Workicho, still works in Ethiopia and is employed as Research Manager for Tufts University, under the Growth through Nutrition project.
- Dr. Netsanet Fentahun, still works in Ethiopia, and is Director for Research and Development at the Bahir University, a promotion from his previous position.
- Dr. Beyene Wondafresh, is an Associate Professor at Jimma University in Ethiopia.

In addition to these individuals, three more doctoral candidates are still working on completing their dissertations, and the remaining two have either abandoned the program or status is unknown.

The PhD component of ENGINE has contributed to the growth of human capital in nutrition that now exists in Ethiopia. In addition to the benefits conferred upon the individual recipients, there is another benefit that may be less apparent. One comment from the policy research conducted under ENGINE was the frustration that donors tended to use technical input from outside experts rather than relying on in-country expertise. The advantage of Ethiopian scholars is that they have both the disciplinary credentials but, equally important, experiential skills based on the local context. This latter point can be invaluable in understanding the local context for food security and nutrition issues. Therefore, continuing to increase the number of individuals with graduate degrees at all levels of government and academic institutions will continue to be important.

The capacity development efforts under Growth through Nutrition have continued but have taken on different forms. Here again, input was solicited from key stakeholders in a workshop held in Addis Ababa in Feb 2017. The capacity building needs that were identified were wide ranging and indicated that a multi-faceted approach was needed. To this end, a menu of approaches for capacity development have been launched under Growth through Nutrition.

For one component, Tufts University utilized its extensive experience in distance learning in developing a series of short online certificate training programs. The courses are designed to provide instruction and capacity building around key themes related to enhancing nutrition knowledge and informing policy

and programming for multisectoral nutrition approaches. The intended audience for the courses is those engaged in designing, implementing, funding and evaluating multisectoral programs and policies in Ethiopia at both a national and regional level. After watching the lecture and successfully completing a knowledge test, a certificate from Tufts University is issued to the participant. The courses are offered free of charge. Because of extensive advertising of the courses, demand has grown significantly. The online courses will continue to be developed in response to the articulated needs of stakeholders and a sustainable solution to providing the courses at the end of the project will be sought. The full list of courses is included in Table 2.

Separate from the certificate courses, Tufts has also created a series of online lecture modules focused on reviewing significant publications related to food security, diet and nutrition. This series is called Updates on Nutrition. This is an attempt to alert audiences to major publications in real time and to capture and explain relevant findings. Some module examples include a discussion of the 2019 EAT Lancet Series on healthy, sustainable diets; the 2018 FAO State of Food Insecurity Report and the 2018 Global Nutrition Report. This series will continue to be updated regularly to reflect newly emerging reports.

The Tufts project staff have also led the training for knowledge management and responded to the technical support and training needs of partners involved in Growth through Nutrition. The team has developed and tailored some existing project tools to capture and support the dissemination of research findings, learning and knowledge and has also provided learning management training to regional and country offices through Growth through Nutrition on learning management tools including Yammer and Microsoft Teams.

Measures of the impact of capacity development can often be elusive. One example will illustrate this point. In a qualitative assessment by Drs. Jere Behrman and Shibani Ghosh (not related to ENGINE or Growth through Nutrition) the researchers were told by local government officials that the current work around development of policy supported by Save the Children and USAID, drew from the original work conducted under the ENGINE governance study; in addition, the research on the importance of dietary diversity in meeting nutrient needs for children under five and the importance of maternal nutrition, particularly in adolescent females, were used extensively by GOE in drafting public policy. This type of experiential evidence, often not captured in published literature, is important in understanding when and why research gets translated into programs and policy.

The learning agenda complements, supports and collaborate with existing research and learning platforms; for example, Tufts has been working with ECSC-SUN, FMOH RAC and EPHI–MER to help build capacity, share lessons learned, and share and promote project research findings. For instance, the findings from ENGINE studies were communicated to address most of the policy/program questions raised during one of policy questions prioritization workshops led by NIPN/EPHI.

## 7.0 Communication

Tufts has employed a multi-pronged strategy for communication and dissemination. A series of papers from both ENGINE and Growth through Nutrition have been published (Table 1). These publications reach a large audience involved in food security, agriculture, nutrition and interventions. In addition,

briefs on the priority issues of national importance have been developed from ENGINE and Growth through Nutrition. To complement the papers and the briefs, Tufts researchers have presented at both National and International venues; some examples include the Micronutrient Forum in Cancun and the International Union for Nutritional Science in Argentina.

For Growth through Nutrition, Tufts hosts a project web site which is regularly updated with project related news items, resource materials, blogs etc. Additionally, a major focus for communicating research results are through internal and external learning events which were scheduled throughout ENGINE and continue under Growth through Nutrition. In the 2<sup>nd</sup> year of project implementation, Tufts established a project research and learning working group which brings together focal persons from different nutrition and wash projects quarterly for sharing and discussing evidences and lesson learned to inform nutrition programming and policies. This platform has also set a stage for creating a culture of cross communication among different project and sharing leasson learned for nutrition programming and policy purposes. In general, it is encouraging to observe improved culture of evidence use for programming and policy purposes since the 1<sup>st</sup> research and landscape assessment was conducted in 2017, which identified this as a major gap and also served a basis for establishing the platform. Various sources of evidences including studies conducted by Tufts and project implementing partners, joint supportive supervision, etc., are increasing being utilized for planning, proگرامing and policy purposes.

## 8.0 So What? – From Research to Action

Policy decisions are affected by a myriad of factors. It would be presumptuous to link any one study, by itself, to policy changes made by GOE. There are however examples of where research from ENGINE and Growth through Nutrition has influenced or informed GOE strategies.

The current draft GOE strategy on food and nutrition recommends that a functional governance body for strengthening the coordination and integration of food and nutrition policy be developed. OR studies conducted under ENGINE and Growth through Nutrition shed some light on models of effective governance. The policy/governance study conducted under ENGINE provided the opportunity to view the facilitators and barriers to implementation of NNP I through the lens of implementers and others. A clear finding was the recommendation that the oversight body for multisector policies should be situated at the highest level. This was suggested as one key approach for keeping up a momentum for nutrition. In addition, the study findings also were adamant that the chair of this coordinating body should not come from the Ministry of Health. As noted from the OR studies, respondents commented that if the chair of this body comes from health, it is perceived, rightly or wrongly, as a health initiative, creating one more barrier for active participation of other sectors. The soon to be released Food and Nutrition Strategy proposes a coordinating body that would be overseen by the Office of the Prime Minister. This GOE strategy acknowledges that this arrangement sends a clear signal that nutrition is important, and equally significant, this newer structure sends the signal that all sectors are important.

Ethiopia, like many countries, stresses a multi sector approach for achieving food and nutrition goals. This quote, “To go fast, go it alone; to go far, go it together” encapsulates the essence of the advantages of a multi sector approach. FSN issues are inherently cross sectoral and multi-disciplinary and, as such, their design and implementation need the cooperation/contribution of multiple actors (public, private, civil society) and institutions of government (ministries, planning commissions etc.). Usually, single

ministries oversee different parts of the FSN agenda (as for instance the Ministry of Agriculture is typically responsible for Food Security and the Ministry of Health for Nutrition). GOE has concluded that the multi sector approach has been less ineffective than what was anticipated from the launch of NNP I and II. While multi-sector/cross-institutional policies actions and investments may be the ideal way of dealing with crosscutting issues such as food and nutrition security (FNS) such practices, while conceptually elegant, are complicated, and not always efficient. The GOE's upcoming FNS strategy emphasizes what can be summarized in the phrase "think multisectoral, but act by sector". This sentiment was reflected in the prior OR studies in ENGINE and Growth through Nutrition. Several actions are proposed in the upcoming strategy to achieve a more effective structure for oversight. For example, a National Food and Nutrition Council (NFNC) is proposed; the NFNC will be composed of all sectoral ministers, regional presidents and city administrators and led by the Prime Minister. The structure of the NFNC sends the clear signal that all sectors are important and have should have equal "ownership" of this new strategy. The impact of the NFNC is reinforced by the recommendation that at all levels, there will be the creation of an institutional arrangement in the different implementing sectors to ensure accountability and effective implementation of the FNS strategy. A specific strategic action is to review and approve the allocation of adequate food and nutrition budgets for each sector. The idea of a dedicated budget was one finding articulated from the key informant interviews in ENGINE. Indeed, most of the revised governance structures outlined in the new GOE strategy were ones that were articulated in the OR studies from ENGINE and Growth through Nutrition.

A common response from both ENGINE and Growth through Nutrition governance studies was that there needed to be more specificity in what each sector is expected to do and how. The major bottleneck identified by the key informants was the lack of "road map" for what each sector is expected to achieve; while multi sector is the model, each sector acts independently to contribute to the advancement of SDG2-zero hunger. Budgets are also allocated by sector, reinforcing a sector approach for a multi sector plans to succeed. The draft FSN strategy, acknowledges a multi sector perspective, but as part of the strategic actions GOE provides specific objectives to be achieved by sector. This is seen by GOE as a more pragmatic method for ensuring sectoral food and nutrition activities.

Current experiences suggest rethinking issues related to multi sector and sector policies. Problems must be addressed in an interdisciplinary way that influences the development of multi sector approaches; each stakeholder's role then needs to be clearly articulated as part of this process including government – national and local – private sector and civil society. The GOE draft strategy, under strategic initiative 3, details a number of actions that are geared toward more coordination, harmonization at all levels of government. Many of these recommended actions were identified in the ENGINE governance/policy study.

The agriculture-nutrition study conducted under ENGINE provides a strong research base for many of the GOE priorities in the draft strategy. For example, the GOE focus on the increased production of diversified, nutrient rich foods is supported by the agriculture-nutrition study results.

The draft GOE strategy emphasizes the creation of public awareness of food, nutrition and healthy lifestyles using different channels for communication. Throughout the draft strategy there is a focus on social and behavior change communications. Specifically, the GOE strategy calls for more emphasis on

WASH, by raising the awareness of the importance of hand washing as well as body hygiene. Here again, in the Growth through Nutrition governance study, lack of water and poor hygiene were reported as significant issues in each of the four regions. Interestingly, WASH was not mentioned as a problem in the earlier ENGINE study. The SBCC review under Growth through Nutrition identified specific behaviors related to WASH that were significant in promoting child growth. These can serve as the building blocks for WASH related messages. Similarly, the testing of the virtual facilitator revealed that this technique was related to increases in washing facilities and the use of soap for handwashing. VF turned out to be an effective way to increase awareness about water use and hygiene in general. The use of multiple sources of media – ECC and VF – was an effective way to improve food, nutrition and WASH literacy.

The SBCC activities of GOE highlight the imperative need for behavior change to promote good nutrition and prevent harmful, traditional behaviors. The decisionmaking OR study from Growth through Nutrition had some important observations relevant to behavior change strategies. Fruits and vegetables are viewed by some households as luxury foods, and often not given to children. In part due to Growth through Nutrition these attitudes are changing. Culture and traditions can be changed with well focused SBCC efforts.

Ensuring quality and comprehensive inpatient and outpatient treatment services at all health care facilities and throughout the health system is a significant part of the GOE strategy. The quality improvement OR under Growth through Nutrition examined certain aspects of quality care; models for quality improvement were tested and provide some insights into changes that can contribute to increased quality in health centers and health posts.

Gender is a cross-cutting issue targeted by GOE. The research under ENGINE and Growth through Nutrition have shed light on the major food and nutrition problems for women in Ethiopia and identified some of the underlying determinants. An important result from the ENGINE birth cohort research was that adolescent females need to be targeted to improve neonatal outcomes. The message was clear that programs need to reach females well before they are pregnant. This adolescent focus is now a significant part of the GOE strategy.

## 9.0 Going Forward

The nutrition landscape in Ethiopia is constantly changing. Operational research will continue to be critical for the design and implementation of evidence-based policy.

The draft GEO plan emphasizes the development of a system for evidence generation and utilization of up to date information for monitoring and evaluation and decision making. Databases like those generated as a result of ENGINE and Growth through Nutrition research can contribute a rich source of information in designing the evolving food and nutrition strategies.

There has been a renewed interest, reflected in comments from the governance/policy OR, in pursuing a food systems approach for achieving zero hunger targets of SDG2, hunger, food security, sustainable agriculture and elimination of malnutrition in all its forms. In addition, a food systems paradigm has been suggested as a viable way of approaching SDG12 – responsible production, responsible consumption

(Global Panel, 2016). Much of elevated interest in food systems has been sparked by the obesity epidemic.

There are a variety of food systems ranging from the traditional system to the industrial system. There are positive and negative effects of each type of food system. Traditional rural food systems still dominate in Ethiopia. Traditional, rural systems face higher rates of food insecurity, undernourishment, micronutrient deficiencies and until recently lower rates of overweight and obesity and NCDs. These problems drive the actions needed by the GOE. The Agricultural Growth Program, for example, focuses on food security and sustainable agriculture as prime targets. Another example is the Growth through Nutrition distribution of iron/folate supplements which addresses one aspect of micronutrient deficiencies. Using a food systems paradigm, longer term approaches to alleviate micronutrient deficiencies could include the more wide spread use of fortification. The food systems in place can be leveraged to achieve wider coverage of the population with fortified foods.

At the other end of the food systems continuum, urban, industrialized food systems are associated with low rates of undernourishment but higher overweight, obesity and NCDs. Increasing these types of food are emerging in urban centers in Ethiopia. A food systems perspective allows GOE to identify and test alternate strategies for modifying the food environment to accelerate progress in increasing healthy diets, particularly, in vulnerable groups.

The dilemma for most countries is that there are many theories about effective food systems, but not a lot of evidence on the changes needed to improve the food security, diet and nutrition impacts. This is particularly apparent for addressing overweight and obesity through a food systems paradigm. Put quite simply, countries are grappling with what changes in food systems can be made to have significant, positive impacts on decreasing overweight and obesity with little empirical evidence available to guide modifications in policies and programs.

Input from the agriculture-nutrition linkages study and some key informants strongly suggest that a food systems approach as part of the agricultural transformation holds an enormous potential to link rural and urban areas; rural revitalization will require the expansion of job opportunities for the rural, unemployed – many of these are youth. A more effective food system can contribute to these goals. A transformed food system could be an effective mechanism for increased agricultural production, decreased poverty, job creation, and improved food security, diet and nutrition. To be successful, the transformations in food systems must be evidence based; at the moment there are huge gaps in our understanding of new paradigms for food systems that will be successful in addressing the changing demands posed for sustainable agriculture and sustainable consumption.

Traditionally nutrition specific programs have focused on under nutrition. It is now apparent that globally there is an obesity epidemic. What is desperately needed is an innovative in policies and programs that can address this crisis. To reach this goal, operational research will be essential.

The commitment of GOE to advance the nutrition agenda is apparent. Leadership and successful governance structures are critical. The draft strategy for Food and Nutrition is a step forward in recognizing the complexity of factors that impinge on food security and nutrition, and lays out a coherent set of actions that will lead to progress in eliminating malnutrition in all its forms.

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## Table One: Publications

### ENGINE

#### USAID ENGINE Birth Cohort Study Peer Reviewed Publications

Workicho, A, Belachew, T, Argaw, A, Roba A., Ghosh S., Kershaw M., Lachat C and Kolsteren P. Maternal nutritional status mediates the association between maternal age and birth outcomes. *Matern Child Nutr.* 2020;e13015. <https://doi.org/10.1111/mcn.13015>

Kidane-Woldetensay Y, Belachew T., Ghosh S., Kantelhardt EJ., Biesalski HK and Scherbaum V. The Effect of Maternal Depressive Symptoms on Infant Feeding Practices in Rural Ethiopia: Community Based Birth Cohort Study. Under review *International Breastfeeding Journal* [10.21203/rs.2.18526/v1](https://doi.org/10.21203/rs.2.18526/v1)

Workicho A., Belachew T., Argaw A., Ghosh S., Kershaw M., Lachat C., and Kolsteren P. Adolescent pregnancy and linear growth of infants: a birth cohort study in rural Ethiopia. *Nutrition Journal* 2019 18:22 <https://doi.org/10.1186/s12937-019-0448-0> Received: 1 October 2018 Accepted: 22 March 2019

Ghosh S., Spielman K., Kershaw M., Ayele K., Kidane Y., Zillmer K., Wentworth L., Pokharel A., Griffiths J.K., Belachew T. and Kennedy E. Nutrition specific versus sensitive factors and their association with mid upper arm circumference as a measure of nutritional status in pregnant Ethiopian women: Implications for programming in the first 1000 days. *PLoS One.* 2019 Mar 26;14(3):e0214358. doi: 10.1371/journal.pone.0214358. eCollection 2019.

Workicho A., Belachew T., Ghosh S., Kershaw M., Lachat C., and Kolsteren P. Burden and determinants of undernutrition among young and pregnant women in Ethiopia: a multivariable hierarchical regression analysis. *Maternal and Child Nutrition* First published: 13 November 2018 <https://doi.org/10.1111/mcn.12751>

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## USAID ENGINE Agriculture-Nutrition Linkages Peer Reviewed Publications

Coates J, Patenaude BN, Rogers BL, Roba AC, Woldetensay YK, Tilahun AF, Spielman KL. (2018). Intra-household Nutrient Inequity in Rural Ethiopia. *Food Policy*. 81:82-94.

Fentahun Babbal N, Belachew T, Coates J, Lachat C. (2018). Seasonality and Determinants of Child Growth Velocity and Growth Deficit in Rural Southwest Ethiopia. *BMC Pediatrics*. 18(20) doi: 10-1186/s12887-018-0986-1.

Coates J, Rogers BL, Blau A, Lauer J, Roba A. (2017). Filling a Dietary Data Gap? A validation of the adult male equivalent method of estimating individual nutrient intakes from household-level data in Ethiopia and Bangladesh. *Food Policy*. 72:27-42. Doi:10-1016/j.foodpol.2017.08.010.

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### Growth through Nutrition

Kennedy E, Stickland J, Kershaw M, Biadgilign S. Impact of Social and Behavior Change Communication in Nutrition Specific Interventions on Selected Indicators of Nutritional Status. *J Hum Nutr* 2018;2(1):34-4.

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### Submitted Manuscripts:

Tadesse S, Kershaw M, Knapp R, Gizaw R, Biadgilign S, Feleke A, Dessalegn Y, Abuye C, Kennedy E. Household Decision Making: Implications for Production, Consumption and Sale of Nutrient-Rich Foods (Submitted to *Ecology of Food and Nutrition*, January 2020)

Kennedy E, Mersha GA, Biadgilign S, Tessema M, Zerfu D, Gizaw R, Kershaw M. Nutrition Policy and Governance in Ethiopia: What Difference Does Five Years Make? (Submitted to *Food and Nutrition Bulletin*, February 2020)

Kennedy E, Kershaw M, Biadgilign S, Gizaw R, Stickland J. Assessing Multisectoral Coordination for Nutrition Policy Effectiveness in Ethiopia: Analysis of Facilitators, Constraints and Solutions for Implementation in Ethiopia. (Submitted to *PLOS ONE*, March 2020)

## Table Two: Growth through Nutrition Online Training Courses

### Certificate Courses:

1. Nutrition Sensitive Interventions
2. Nutrition and Food Systems
3. Strengthening Food Consumption Information Systems to Promote Healthy Diets
4. Environmental Enteropathy (EED), Microbiome, Mycotoxins and Stunting
5. Agroecology and Other Approaches to Sustainable Agriculture
6. Sustainable Agriculture and the Role of Livestock
7. Research Challenges at the Intersection of Agriculture, Diet and Health
8. COVID-19 and Nutrition

### Updates on Nutrition Series:

1. Updates on Nutrition: 2018 Global Nutrition, State of Food Security and Nutrition in the World, and EAT-Lancet Reports
2. Updates on Nutrition: 2019 Global Food Policy Report