8-2015

Investing in Communication for Nutrition Related to Agriculture in Ethiopia

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Recommended Citation

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Keywords

health communication, behavior change communication, mass media, radio, nutrition, agriculture, development, monitoring, evaluation, Ethiopia

Disciplines

Agriculture | Communication | Nutrition | Social and Behavioral Sciences

Investing in Communication for Nutrition Related to Agriculture in Ethiopia:
A case for investment and how to construct a successful intervention

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Report submitted to the Bill and Melinda Gates Foundation[1]

Contents

Introduction

This report to the Bill and Melinda Gates Foundation was meant to be of assistance as the Foundation considered alternative places and pathways for investment in communication to improve the nutritional status of young children in Ethiopia. The authors spent several months in background research and interviews with experts before a relatively brief (half-month) field trip to Ethiopia where they met with a wide variety of individuals engaged in activities relevant to communication, nutrition, and agriculture.

The report is structured to be of maximum assistance in the decision-making process. After a brief overview of our objectives, the report begins with the core recommendations for the implementation of a potential program in this area, with some emphasis on the innovative elements. The proposal includes a brief section providing some background information about our task and work, then focuses on three major components: the proposed intervention itself, a novel feedback/feedforward system to be integrated into the intervention, and a call for independent evaluation of the intervention. The remainder of the document is organized as a series of appendices. They provide the foundation to these recommendations, elaborating some of the information we obtained through the background research and interviews. The appendices include: a discussion of the nutrition situation in Ethiopia and the assumptions we made about nutrition in constructing the proposed program; a discussion of the current context and opportunities for realizing a communication intervention, and some thoughts about the institutional and regional context and their implications for shaping the program. The final section of the report presents extended case studies of work by seven organizations (6 currently working in Ethiopia) whose activities are particularly relevant to thinking about how to move forward in the area of communication for nutrition in Ethiopia.

Background

Our mission is to consider the potential application of a communication intervention to improve behaviors at the intersection of agriculture and nutrition in Ethiopia. There are already projects in Ethiopia that are working in select woredas (districts) to strengthen the nutrition content of the existing Government Health Extension Worker (HEW) and Agricultural Extension Development Agent (DA) programs. The proposal we outline below, which focuses on the role of communication media, is expected to complement these existing efforts to do interpersonal communication (IPC), but does not rely on their operational reach or effectiveness.

Behavior Change Communication (BCC) which involves mass media has been shown elsewhere to be a valuable tool in reaching very large numbers of people with powerful messages, often leading to changes in critical behaviors.

Wakefield, Loken and Hornik (2010) summarized the evidence about "Use of Mass Media Campaigns to Change Health Behavior" in both more- and less-developed country contexts for the Lancet in 2010.[i] They concluded "mass media campaigns can produce positive changes or prevent negative changes in health-related behaviours across large populations." In considering what contributes to successful outcomes for such programs they pointed to "concurrent availability of required services and products, availability of community-based programmes, and policies that support behaviour change." They argued for "investment in longer better-funded campaigns to achieve adequate population exposure to media messages."

Through a systematic review of the literature, Naugle and Hornik (2014) summarized and evaluated the evidence for the effectiveness of mass media interventions for child survival in lower- and middle-income countries.[ii] The authors reviewed evaluations of campaigns addressing diarrheal disease (15), immunization (8), malaria (2), nutrition (14), preventing mother-to-child transmission of HIV (1), respiratory disease (4) and reproductive health (67). They concluded that interventions with mass media campaigns can positively impact a wide range of child survival health behaviors in low- and middle-income countries. These include one-off behaviors like tuberculosis testing or vasectomy, episodic behaviors like vaccinations, use of oral rehydration therapy, and early initiation of breastfeeding, and habitual behaviors like nightly bed net use, hand-washing, consumption of iron and vitamin A-rich foods, and use of modern contraceptives. In addition, they found that evaluations show effects across theoretical frameworks, channels, target audiences, message types and styles, and evaluation designs.

Although data on the cost-effectiveness of health communication campaigns is limited, some studies suggest that mass media centric interventions can be an extremely cost-effective approach. Only two of the evaluations included in the 2014 review provided cost-effectiveness data: Guilkey & Hutchinson (2011) detail costs of $0.05 per additional antenatal care user and $0.30 and $0.36 for each additional child vaccinated for measles and DPT3 respectively. Bowen (2013) determined that the Knock Out Malaria Campaign cost $1.62 per additional person protected by a mosquito net. In the evaluation of a TV serial drama to promote condom use in India, investigators determined that the cost-effectiveness of the drama was $2.49 per person using condoms more consistently and of TV spots was $2.70.[iii] Using the Lives Saved Tool, Roy Head and colleagues have estimated that saturation-based media campaigns cost $1-$10 per DALY (disability-adjusted life year saved) to deliver.[iv] According the World Health Organization, interventions that cost below US$100 per DALY averted are "good" and those that cost below US$25 are "excellent," placing mass media campaigns among the most cost-effective of all currently available health interventions (the most cost-effective being childhood immunizations at $1-$8 per DALY averted).

Nevertheless, the application of BCC which involves mass media in the context of the food system to reach poor rural audiences at scale is not well understood. In the case of agriculture related to nutrition, BCC interventions have good potential to

reduce under-nutrition because they can play a central role in addressing both the immediate determinants of nutrition through nutrition specific interventions and the underlying causes of undernutrition through advocacy for programming and policy in other sectors which support nutrition-sensitive decisions.   However, that success is contingent on skill (or reliance on partners with the skill) in the choice of behaviors, the development of persuasive messages, the development of a strategy for getting exposure to those messages, and the construction of a research and feedback system able to support the program.

We have met with a range of organizations working at the intersections of communication, agriculture, and nutrition. These have included ACDI/VOCA, BBC Media Action, Family Health International 360 (Alive & Thrive), USAID, Farm Radio International, DFID, Ministry of Health/REACH, IFPRI, the Addis Ababa University, Agriculture Knowledge, learning and Documentation Project (AKLDP), Population Media Center, the Central Statistics Agency, Save the Children (ENGINE Project), ACF, Concern Worldwide, the Micronutrient Initiative, UNICEF, Agricultural Transformation Agency (ATA), CONCERN, and the BMGF. The team also spent two days in the field with Digital Green to see their interventions in action.

Many of these groups are doing important communication work and, in some cases, their work is closely allied with components of the proposal elaborated here. In Appendix B, we provide brief descriptions of the work of some of these groups, emphasizing the logic of the approach of each.

The proposal

We propose the development of 1) an intense radio-based intervention, integrating 2) a feed forward/feedback system to help shape the evolving intervention and 3) a well-designed evaluation to permit credible inference about the effects of the communication intervention. We outline each of those components here.

1. **The intervention**. The core of the proposed intervention consists of intense radio programming with high quality messages airing frequently in a variety of formats.
   a. The intervention should be structured so as to assure that men and women who have access to radios (whether because of radio ownership or opportunities to listen to others' radios or to listen to streamed content on cell phones) are reached frequently (3-5 times per week) with relevant messages presented in different formats.
   b. The messages would appear both as spots in popular programming so individuals would not have to seek them out <u>and</u> in long form programs (magazines and dramas) where listeners would have to seek them out, but where more nuanced arguments or discussion might be incorporated. There is a good deal of experience in Ethiopia with a range of radio formats, particularly, spots, weekly magazines with production formats relying on audience participation, and serial

dramas. We believe that the existing experience and professionalism, as described in the Appendix B case studies, can be used to develop strong messages, and will support the use of different formats and programs sources to increase opportunities for repeated exposure to those messages.

    c. In addition to a primary focus on radio, it may make sense to incorporate marketplace billboards or other materials, insofar as they reach much of the target population. We have also considered the use of mobile phones as elaborated more extensively in Appendix A2.

The intervention would eventually address multiple behaviors over time and do so appropriately for the local (regional and sub-regional) context and reflecting seasonal and other context variations (e.g., religious fasting periods).   However, in any one period of time and in any one region, programming should provide repeated messaging focused on influencing a specific behavior. Communication programs which spread their attention to multiple messages about multiple behaviors may be less effective.[2]

What behaviors might be the focus of this type of this programming? We have focused our attention on behaviors that could be expected to improve dietary diversity under the assumption that better dietary diversity is associated with reductions in young children's stunting. Examples of these behaviors are described in more detail in appendix A1, but below are some illustrative examples of target audiences and behaviors (not the actual messages). These provide some indication of the audiences and behaviors that might be the focus of intervention messages:

- *Livestock owners: Save at least one cup of milk each day for your child 12-24 months old.*
- *Poultry owners and caregivers of children under 2: Add one egg a day to the porridge of your child aged 12-24 months.*
- *Farmers: Purchase and plant kale (or other local dark green vegetable) in your gardens (messages timed with the pre-planting season).*
- *Caregivers of children under 2: Add X spoons of chopped kale to the porridge of your child aged 6-24 months every day.*
- *Fathers, save X birr per week for buying meat, eggs and/or milk to add to the porridge of your child aged 6-24 months.*
- *HEWs: Educate mothers of children aged 6-24 months about timely targeted complementary feeding practices.*
- *DA's: Work with farmers to overcome barriers related to obtaining quality seeds and improve household level water catchment for gardens.*

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[2] Wakefield, M., Loken, B., Hornik, R. "Use of mass media campaigns to change health behavior" *The Lancet.* Vol. 376 No. 9748 pp 1261-1271 October 7, 2010. DOI:10.1016/S0140-6736(10)60809-4

The mediated intervention would influence behavior both through direct messaging addressed to those who are to adopt behaviors and through indirect channels. It might influence dietary diversity through four complementary pathways:

a. Direct education of individuals who are not reached with nutrition content by the Health or Agricultural extensions systems, either because they are not in kebeles (neighborhoods) or woredas where HEWS or DAs are providing nutrition information as part of their responsibility or because of operational problems undermining the effective outreach of HEWS or DAs even where they are expected to provide nutrition-related information.
b. Indirect exposure via retransmission through informal and institutional interpersonal channels that may be available and active at the kebele or village level. If messages about particular behaviors are heard repeatedly they are likely to be picked up by 'opinion leaders' and passed on. Indeed, it will make sense to design the media content so as to make it more likely that these intermediary channels will carry the messages forward over time (e.g., in a radio drama having a religious leader character modeling the desired retransmission actions). Some potential intermediary channels include the HEWS and DAs, but also religious leaders, women's groups, the health development army, and formal community leadership.
c. Reinforcement of the direct outreach communication work by HEWs and DAs (and their associated volunteer cadres and development groups) in areas where those activities are being realized including through NGO-funded or other IPC projects. Individuals will then be receiving relevant messages from multiple sources.
d. Reminding of the details of essential nutrition messages for the already trained HEWs and DAs. As the agents are exposed to those messages repeatedly through radio presentations the quality of their own communication work may be improved.

Although several organizations in Ethiopia are already working to affect nutrition behavior through some of these pathways, one of the ways in which this proposal is novel is in the call for intensity. Some of the existing approaches may be designed to transmit particular messages infrequently (once in several months for an average member of the target audience) rather than the 3-5 times per week our proposal suggests. Most existing programs are not reaching target audiences with the same message multiple times and via multiple platforms/formats.

> *The argument for intensity: Hearing messages multiple times may be expected to influence behavior in ways distinct from the ways that less intense interventions may influence behavior. Hearing a message once in a while may encourage an individual to consider the new behavior but may do so largely because of the argued benefits or perceived costs of the behavior. Intense messaging may produce effects for reasons over and above its intrinsic persuasiveness: multiple exposures will give individuals more time to process the messages and learn about the ideas behind the behavior; multiple exposures through different formats will make it more likely that people will hear the message in a context which he or she finds persuasive; hearing a message frequently may carry an implicit meta-message that the behavior is socially expected; frequency may increase the likelihood of subsequent social discussion about and diffusion of the ideas put forward; frequent and repeated availability of messages makes it more likely that individuals will hear a message when they are ready to consider change.*

2. **The feedforward/feedback system**. The effectiveness of a communication intervention depends on a) its ability to know its audience – what its current behavior looks like, what is likely to stimulate or retard behavior change, what communication channels might reach that audience, what the context of the behavior is and whether that is changing over time b) as the program moves into an operational phase, its ability to know whether the audience is being reached and how its audience is changing in response to program actions and other context changes.

> *There are other terms in the evaluation literature for each of these phases of research: feedforward research is often called foundational or formative research and feedback is often referred to as monitoring or surveillance. We use feedforward and feedback to emphasize that the value of each of these research efforts is defined by their ability to be fed into operational decision making by interventions.*

Feedforward is exemplified by (a) and (b) below; feedback is exemplified by ((c), (d) and (e) below. Here are some examples of the sort of knowledge which would guide program decisions:

   a. Know on a continuing basis how the context of the target audience is changing. For example, if one recommended behavior is to add-in other ingredients to a six month old's porridge, using knowledge about whether the items are available at an acceptable price in the market or from a home garden, one can modify the messages accordingly.
   b. Know about what arguments are likely to persuade individuals to adopt a specific behavior (e.g., are they more persuaded by claims of nutritional benefits, by assurances that the behavior is culturally or

religiously permitted, by social expectations – that others similar to them are adopting the behavior, by learning about the ease of adopting the recommended practice, or by learning the skills and feeling confident that the action can be taken?)

c. Know about how much exposure to messages is occurring and through which program elements it is being achieved.
d. Know about whether messages are actually understood in the ways they are meant to be understood.
e. Know about whether behaviors (and more relevantly the beliefs that underlay them) are moving in the right direction.

There are a variety of ways that such a feedforward/feedback system might be realized. An early effort in program planning would be to consider the cost and operational feasibility of alternative approaches, particularly for construction of the feedback component of the system. A conventional approach would be to use frequent (every 1-3 months) surveys with the target audience; however, given the costliness of such a survey system other mechanisms ought to be actively explored.   The design of such a system will take careful development and the costs of such a system would be substantial. Consideration about alternative means for obtaining good information (through mobile phones for example) will be important. The feedback system must be designed to avoid bias in the sample (while it is tempting to make use of feedback volunteered by known listeners or by another convenience sample) and to avoid bias in the way questions are asked (to avoid merely getting reassurance that all is going well). While focus groups and other qualitative methods may provide important insights/hypotheses about what is happening and why, they are not alternatives to a systematic quantitative system. The success of this sort of feedforward/feedback system would be largely dependent on the ability of project staff to both outline issues that can be addressed through this system and be able to analyze and interpret data coming from the system to suggest changes in direction for the operational program.

The feedforward/feedback systems is the second particularly novel component of the proposal. Many programs invest heavily in formative research before the launch of a program, but rarely have mass media programs successfully used routine data collection and analysis to shape the development of the intervention in real-time, going forward. Given limited resources we recognize that there may be a tradeoff between pre-intervention feedforward research in favor of continuous feedback research. We think programs will find that to be an acceptable trade-off.

> *The argument for a strong feedforward/feedback component: Mass communication, by its nature, has a limited capacity to assess the responses of its audience, unless it formally structures such an audience*

> *connection. While many mass communication programs have incorporated quite substantial formative research components to serve as background to program planning, they often have much less robust efforts at systematic monitoring and surveillance during actual operational periods and are not always able to incorporate the information gathered into program modifications on a constant basis. It may be that resources spent on systematic evidence gathering while a project operates may be more influential on the shape and evolution of the program, than extensive formative research before a program launches. Such ongoing systematic research may provide more information that is actionable by the operating programs.*

3. **The evaluation**. For the operating project, the most valuable research component will be the feedforward/feedback system. From a funder's perspective, nonetheless, a high quality evaluation with solid behavioral outcomes, cost estimates, and the possibility of confident attribution to the communication intervention will be needed. It will likely make sense to bring in an outside entity to design and undertake the evaluation.

   There is a substantial literature about alternative designs for evaluating media campaign effects.[3] Appropriate designs may include randomized control designs, but also a range of other useful designs which exploit natural experiments, and/or over time data collection. However the literature establishes that real-life communication programs have characteristics which put unique demands on evaluation designs. Some of those characteristics may include the expected mechanisms of effect (individual, social and institutional paths of influence), reliance on exposure through multiple sources of messages, evolving behavioral foci, the timing of effects, and the likely unequal distribution of effects, among others. Evaluation planners will need to understand and be sure their proposed designs respect the way communication programs are expected to work.

   In the previous section, a strong argument is made for substantial ongoing data collection to serve the operational needs of the program. It will be worthwhile to consider whether the systematic data gathered for the feedforward/feedback system might not serve double duty as the data for the evaluation if it were designed to do so from the outset.

Core assumptions

In the previous section we outline our proposal and its three main components. However, in shaping this proposal, we made certain crucial assumptions. While we

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[3] Robert Hornik "Evaluation Design for Public Health Communication Programs" in <u>Public Health Communication: Evidence for Behavior Change</u> (ed.) Mahwah, NJ: Lawrence Erlbaum, 2002, p 385-406.

have some evidence for these assumptions, we want to make them explicit here so that those considering the proposal can challenge them. We provide some elaboration of the evidence for each of these assumptions in Appendix A).

1. There are nutrition-related behaviors or practices that, if widely adopted, will reduce the risk of stunting, underweight, and micronutrient deficiencies among children under five and/or positively affect women's nutritional status (for a discussion of what these are, see Appendix A1).
2. For some portion of the rural population (those who are currently food secure but whose children nevertheless show high levels of stunting), income and time do not completely constrain the adoption of improved behaviors/practices that can help prevent nutritional deficiencies.
3. While sources of evidence differ sharply as to current levels of radio listening and radio ownership, radio reaches enough of these households which are food secure, but which include stunted children, to justify the use of radio in an intense way (see Appendix A2 for a discussion of the communication environment in Ethiopia).

Operationalizing the proposed intervention:

Government support is essential for the success and sustainability of any intervention and particularly so in Ethiopia. Therefore it is important to consider the position of the government vis-à-vis the intervention and how best to leverage the government's interest, resources, and commitment.

The Ethiopian government works with NGOs in a complex way. The government expects NGOs to align their work with government policy and in support of government systems. While many informants told us that the government is quite open to ideas that bring evidence, it is also clear that programs that hope to be adopted and expanded must be seen as within the government's purview. While the proposed intervention does not require immediate involvement of health and agricultural outreach workers (although it supports their work where they are available), it will have to obtain government permission to operate, and will be most useful if it is integrated with the regional and woreda level health and agricultural staff so that the themes and messages of the radio programs match the emphases of the health and agricultural systems.

An ideal version of the program should be both operationally efficient but also take advantage of the various capacities of communication organizations already working in Ethiopia. We propose a structure involving one organization with general oversight of the program (providing technical expertise in nutrition; building links with the government at federal and regional levels; designing and managing the feedforward/feedback system and making explicit the implications of its results for producing agencies) that would chair an ongoing management committee which would include regional government representatives from health and agriculture and representatives of each of the radio producing agencies. That

overall responsible institution would work with a variety of producing agencies who would take responsibility for developing and modifying the specific radio (and other channel) messages like those described in the final section of the report. There will be some tension in assuring that each discrete producing agency stays on message while permitting them to make full use of their own style and experiences. Still, we think it would be worthwhile so as to make it more likely that the messages will be appealing to a variety of audience members and to take full advantage of relevant experience and skills available in Ethiopia and elsewhere.

The startup phase should focus on one or two regions to provide an opportunity to fully develop the several components of the program and undertake a careful evaluation. We propose Oromiya and Tigray as possible regions for startup places, as justified in the appendices.

Summary

In summary, BCC interventions have good potential to reduce under-nutrition because they can play a central role in addressing both the immediate determinants of nutrition and the underlying causes of undernutrition. The report proposes 1) an intensive radio intervention in which audience members are being exposed to campaign messages several times a week through several channels/ formats, 2) a feedforward/feedback system of gathering, analyzing, and utilizing systematic quantitative data, and 3) a rigorous outcome evaluation, respectful of the way the program is expected to affect behavior.

More details on the thought processes behind these recommendations can be found in Appendix 1A: Nutrition considerations, Appendix 1B; Communication considerations, and Appendix B: Case studies or organizations working at the intersection of communication, agriculture, and nutrition in Ethiopia.

Appendix A1: Nutrition considerations

A number of nutrition considerations shaped the development of the proposal including an understanding of the main nutrition deficits in Ethiopia and an elaboration of the key behaviors related to the nutritional deficits that might be the subject of the communications intervention.

The main nutrition deficits in Ethiopia

Household food insecurity and undernutrition are significant concerns in Ethiopia. Rates of stunting and underweight have decreased over the past decade, but remain high with 40% of children under five stunted and 21 percent underweight.[4] One quarter of women of reproductive age are undernourished, leaving their children predisposed to low birth weight, short stature, lower resistance to infections, and higher risk of disease and death. Children in rural areas are more likely to be stunted (42%) than those in urban areas (24%), and significant regional variations persist, with Afar (49.2%), Amhara (42.4%), SNNPR (44.3%) and Tigray (44.4%) being the worst affected.[5]

Iron deficiency is common in Ethiopia, particularly among children. The 2011 EDHS found that more than four in ten Ethiopian children under five (44%) are anemic. Anemia prevalence is highest among children age 9-11 months (73%) and decreases steadily with age from 12 to 59 months. Forty-five percent of children in rural areas have anemia, compared with 35 percent of children in urban areas. Regional variation of anemia in children ranges from 33 percent in Addis Ababa to 75 percent in Afar. Anemia among children decreases with increases in mothers' education and wealth quintile. Other important micronutrient deficiencies in Ethiopia include vitamin A, iodine and zinc.

In order to have an impact on any of these nutritional deficits, we have to understand which behaviors are strongly associated with the outcomes of interest.

Key behaviors related to the nutritional deficits

Infant and young child feeding (IYCF) practices. Poor child feeding practices contribute to the high rates of child undernutrition referred to above. Less than half of infants are exclusively breastfed and introduced to complementary foods at the appropriate time in Ethiopia, and only 4 percent of young children receive a minimal acceptable diet.[6] As discussed with the Alive and Thrive team in Ethiopia during our visit, enabling significant improvements in complementary feeding behaviors through social behavior change communication interventions alone at the interpersonal level is challenging. Two key barriers faced, particularly in food

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[4] Mini EDHS 2014
[5] Mini EDHS 2014
[6] EDHS 2011 (Note: mini EDHS in 2014 did not collect information on complementary feeding)

insecure kebeles, include limited access to appropriate micronutrient-dense foods and poor knowledge, attitudes, and practices pertaining to the timely introduction of appropriate foods for children aged 6-24 months. Household purchasing power and the control of resources by men are also barriers to improving complementary feeding practices.

An important factor to recognize with regards to complementary feeding practices is that it is difficult to meet the nutritional needs of children in the age range of 6-24 months because they require high amounts of micronutrients but relatively small quantities (i.e., energy content) of foods other than breast milk. A 2012 multi-country report by Alive and Thrive found that although micronutrient requirements could theoretically be met through diets based on unfortified foods alone, the cost of these diets in Ethiopia was about three to six times higher than the complementary feeding diets that included a micronutrient powder.[7]

Dietary diversity, household production and consumption. Behaviors related to household food production and consumption diversity are also central to the nutrition deficits observed among young children in Ethiopia. One recent analysis of the 2011 DHS found a positive association between higher household and children's dietary diversity scores and improved nutritional status of children under-five.[8] Another study found that the relationship between household food production and increased children's dietary diversity is particularly strong for households with limited access to food markets, but that the relationship does not hold for households that have good access to markets where they might buy and sell food products.[9] These findings suggest that behavior change communication efforts – targeted to productive farmers who bring their goods regularly to market - may be of critical importance to ensure that these farmers / livestock owners understand the importance of children's dietary diversity when they are making food choices with their money earned and deciding whether to sell or keep home grown agricultural products.

Looking deeper into household-level food production, the above-mentioned study by Hirvonnen and Hoddinot in Ethiopia found that overall about 23% of households produce dairy products and 22% produce meat (2014). Households with young children that produced dairy products were highest in Somali region (52%), Oromiya (32%), and Tigray (29%), and lowest in Amhara (4%). Those that produced poultry, fish or meat were highest in Tigray (48%), Somali (28%), and Oromiya (22%), and lowest in SNNPR (8%). Turning to consumption, the same study found that just over half of all Ethiopian children (56%) consume a staple grain, root or tuber. One third consume a legume or nut food and just over 20% consume dairy products and vitamin A rich fruits or vegetables. The study found

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[7] Identifying Micronutrient Gaps in the Diets of Breastfed 6-11 Month Old Infants in Bangladesh, Ethiopia and Viet Nam using linear programming. Alive and Thrive (2013).

[8] Coates et al, 2014.

[9] Hirvonnen and Hoddinot, 2014

marked regional differences, especially in the percentage of children consuming legumes (53% in Tigray and 2% in Somali), dairy (50% in Somali; 6% in Amhara), and vitamin A rich fruits and vegetables (55% in SNNPR; 6% in Tigray and Somali). A separate analysis of the 2011 EDHS data by Ghosh et al. found that the consumption of dairy and vegetables in regions with higher mean consumption can be protective against stunting.[10]

Nutrition assumptions in the proposal

The focus on dietary diversity in the proposal rests on a number of assumptions. The first is that promoting dietary diversity in Ethiopia through mediated communication interventions will result in decreased child stunting, underweight, and micronutrient deficiencies among the target population. While there is some evidence – both globally and from Ethiopia – to show that diverse family diets are associated with lower rates of chronic undernutrition among children under five,[11] the strength of this association, the specific pathways involved (e.g., which specific foods or food groups are most important), and the related causal factors involved (e.g., household proximity to a market, WASH practices, etc.) are less well understood.

A second assumption within our recommended approach pertains to household level access to more nutritious food sources across the different regions of Ethiopia. Based on the research evidence reviewed, our conclusion is that Oromiya and Tigray regions have higher production, consumption, and availability of dairy and meat products compared with SNNPR and Amhara regions,[12] and that these food groups have relatively higher bio-available micronutrient density (compared with tubers, grains, pulses, and vegetables). The assumption put forward in our proposal is that promoting increased dairy and animal food consumption by children under two in regions where these foods are already produced and consumed in higher volumes (Oromiya or Tigray) could lead to increased dietary diversity and, thus, reduced nutritional deficiencies among young children.

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[10] Ghosh et al (2014). Factors associated with stunting in Ethiopian Children Under Five. (https://ethiopia.savethechildren.net/sites/ethiopia.savethechildren.net/files/Stunting%20Lo%20Res.pdf)

[11] Arimond and Ruel.. Dietary Diversity is associated with child nutritional status: evidence from 11 demographic and health surveys. J Nutr; 134(10): 2579-85 (http://www.ncbi.nlm.nih.gov/pubmed/15465751); Mallard et al. (2014) Dietary Diversity at 6 months of age is associated with subsequent growth and mediates the effect of maternal education on infant growth in urban Zambia. J Nutr, 114. (http://jn.nutrition.org/content/early/2014/09/03/jn.114.199547.abstract). 2014; Ghosh et al. (2014) Factors associated with stunting in Ethiopian Children Under Five. (https://ethiopia.savethechildren.net/sites/ethiopia.savethechildren.net/files/Stunting%20Lo%20Res.pdf)

[12] Somali region also has a high production and consumption of meat and dairy however due to two factors (difficulty in reaching pastoral households and the smaller population base relative to Oromiya and Tigray) it is not considered here as a focus pilot region.

A third assumption within our proposed approach relates to the fact that we know from the EDHS data that high levels of stunting persist in households of high producing Agriculture Growth Program (AGP) woredas as well as those which are more food insecure. With this in mind, we assume in our approach that households that are wealthier are more likely to possess a radio and also have some level of financial flexibility to purchase better food for their children.

Table 1: Comparison of wealth status, radio ownership, stunting and underweight – 2014 DHS data, weighted.

Region (rural populations only)	Total rural households	% of population in highest 3 wealth groups	Radio ownership	Child stunting (U5)	Child under-weight (U5)
Tigray	734,357	45%	31%	48%	33%
Afar	192,554	7%	17%	49%	46%
Amhara	3,284,512	43%	22%	43%	29%
Oromiya	4,630,702	58%	38%	40%	24%
Somali	425,150	24%	10%	39%	39%
Benishangul-Gumuz	119,446	40%	38%	42%	32%
SNNP	2,667,787	45%	25%	45%	27%
Gambela	44,879	32%	11%	23%	21%
Harari	17,651	89%	40%	35%	22%
Dire Dawa	21,643	26%	20%	41%	32%

Based on this information, we look positively on Tigray and Oromiya as possible demonstration project regions: a) they have 45% and 59% of their households with under 5 year old children in the top 3 wealth groups; these households are likely more able to purchase additional foods for children; b) they are somewhat reachable through radio (31% and 38% ownership); and c) they still have many children who are stunted (48% and 40%) and underweight (33% and 24%).

Even given the assumptions outlined above, the significant variance in food access and availability both across and within regions, will make it difficult to produce a communication strategy around only one or two simple focus behaviors for the target population (such as "feed more beef, goat or chicken meat to your children 6-24 months" or "feed your child a cup of milk a day"). Moreover, a communication approach that is embedded in the agriculture sector (as opposed to the health sector) will need to carefully align with seasonal value chain activities in the region selected. Some examples of target behaviors and audiences are provided below – each would need to be heavily contextualized with information from formative

<u>research and feedforward operational research findings to cover and adjust to specific barriers</u>. These are examples of target behaviors and audiences; the messages would be designed to influence them.

Livestock:
- *Livestock owners: Sell cut up/ small quantities of meat (lamb, beef, chicken or goat) at your local market.*
- *Caregivers of children under 2: Buy x quantity of meat (lamb, beef, chicken or goat) each month, dry it, store it safely and add 2 spoons of pounded meat to the porridge of your child every day.*
- *Livestock owners: Save at least one cup of milk each day for your child aged 12-24 months.*
- *Caregivers of children under 2: Give your child aged 12-24 months at least one cup of cows milk each day.*

Poultry:
- *DA's: Inform your farmers about how to prepare nutritious poultry feed, poultry health (vaccinations), and about feeding one egg a day to children aged 12-24 months.*
- *Poultry owners and caregivers of children under 2: Add one egg a day to the porridge of your child aged 12-24 months.*

Iron and vitamin A rich vegetables:
- *DA's: Work with farmers to overcome barriers related to obtaining quality seeds and improve household level water catchment for gardens.*
- *Farmers: Purchase and plant kale (or other local dark green vegetable) in your gardens (messaged timed with the pre-planting season).*
- *Caregivers of children under 2: Add X spoons of chopped kale to the porridge of your child aged 6-24 months every day.*

General:
- *DA's: Through cooperative groups and VESAs, talk to women and men about budgeting for specific nutritious foods for children aged 6-24 months.*
- *Fathers, save X birr per week for buying meat, eggs and/or milk to add to the porridge of your child aged 6-24 months.*

IYCF:
- *HEWs: Educate mothers of children aged 6-24 months about timely targeted complementary feeding practices.*
- *Caregivers, give timely targeted complementary foods to your child aged 6-24 months.*

The project lead would ideally coordinate the mediated communication approach messaging with the regional and woreda level Ministry of Agriculture and Ministry of Health officials and NGOs working in the geographic broadcasting area so that

DAs and HEWs would be trained and encouraged, throughout the different cropping seasons, to 1) promote the same messages at the same time as those going out from the radio broadcasts and 2) encourage farmers to listen to the radio magazine or drama programs in order to multiply the number of times and sources that farmers were receiving the desired information.

Alternative approaches. Given difficulties associated with meeting the nutritional needs of children in the age range of 6-24 months due to the high amounts of micronutrients they require but relatively small quantities (i.e., energy content) of foods other than breast milk, in addition to dietary diversity, we also considered two alternative approaches:

1. Scaling up the public and/or private sector marketing and provision of multiple micronutrient powders (MMP) in Ethiopia.

Multiple micronutrient powders are single-dose packets of vitamins and minerals (e.g., iron, zinc, B vitamins, etc.) in powder form that can be sprinkled onto any ready-to-eat semi-sold food consumed at home, once a day. The powders are used to increase the micronutrient content of a child's diet without changing their usual habits. A 2011 Cochrane systematic review that evaluated the effects and safety of home fortification with multiple micronutrient powders of foods consumed by children under 2 years with regard to improving health outcomes in 7 countries found that anemia was reduced by 31%, but no effect on stunting, underweight or wasting was observed.[13]

In terms of distribution models, both public and private sector approaches have been, and continue to be, tested and evaluated to market and distribute MMP to rural African households. Both models face significant limitations with respect to affordability, scale-ability and sustainability. In Ethiopia, HEWs, Health Development Army volunteers and community based organizations have potential to serve as distribution networks of MMP (on either a free or heavily subsidized basis) but, as mentioned in the background section, these staff face considerable constraints on their time and capacity. Alternately, private sector distributors (e.g., those who reach community vendors with products such as soap, condoms, salt) could also be used.

Small pilot projects and research into MMP use –including household level acceptability of MMP - is currently being conducted in Ethiopia, supported by GAIN, the Micronutrient Initiative, UNICEF, and other partners, but the approach has not

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[13] De-Regil LM et al. Home fortification of foods with multiple micronutrient powders for health and nutrition in children under 2 years of age. *Cochrane Database of Systematic Reviews* 2011, (9): CD008959.

been rolled-out at scale. A comprehensive strategy to scale up MMP in Ethiopia through a regional-scale pilot would necessitate thorough approvals with government and regulatory bodies, formative research to appropriately cost, market, target, brand and distribute the product and an on-the-ground regional team to support, monitor, and evaluate the project. Once ready, a strong mediated communication strategy could be very effective, several years from now, at promoting MMP at the right price point.

2. Scaling up the local production and private sector marketing of fortified complementary cereals for children aged 6-24 months.

In our discussions we also learned that UNICEF and the Micronutrient Initiative are piloting a project to promote the local production of fortified cereal for children aged 6-24 months in Ethiopia, using entrepreneurial women's groups. An evaluation of this project has not yet been completed. Similar limitations to those mentioned above, in addition to quality control and cost-effectiveness of the product itself, present challenges to organizations seeking to distribute this product to rural communities.

Appendix A2: Communication considerations

The following discussion points reflect important communications considerations that helped shape the proposed intervention including current and potential government support for communication interventions at the intersection of agriculture and nutrition, current methods of diffusion of nutrition information, an elaboration of our decision to focus on the radio as the primary intervention channel, and a discussion of the choice of target audience.

Role of the Ethiopian government

Is the Government of Ethiopia interested in nutrition? The government has a growing interest in nutrition issues and was updating its current National Nutrition Program during our visit. The Federal Ministry of Health is the government lead on nutrition and chairs the national multisectoral nutrition steering committee. The sharpest uncertainty was the commitment of the Ministry of Agriculture to nutrition which was widely discussed; its openness to incorporating nutrition concerns alongside policies to maximize agricultural productivity when developing its work plans and strategies was not resolved. Many of those we interviewed addressed this issue both because it was being heavily debated in the context of the new Agriculture Growth Program (AGP II) and Productive Safety Net Program (PSNP IV) which are both being negotiated, and because it would play out in what the regional and woreda-level agriculture and livestock staff would be responsible for with regards to nutrition.

The Ethiopian government's openness to evidence. Many informants stressed the importance of evidence and said that the government was willing to adopt new intervention approaches if it could be convinced with good evidence from projects that worked. This suggests that strong evidence from a demonstration project may be influential.

Current diffusion of nutrition information

To build an effective communications intervention at the intersection of agriculture and nutrition, we have to understand how and by whom nutrition information is currently being diffused and how it might be diffused during the proposed intervention.

How is nutrition information currently diffused? Most nutrition information diffusion is in the hands of the government extension systems for health and for agriculture: within the health extension system, there are typically two kebele (village) level health extension workers (HEWs) who work out of a heath post which serves around 5000 people. They have a broad set of responsibilities, including providing some curative care and family health education on many topics. They initially receive a one-year pre-service training. On-the-job skills upgrading is also provided through a cascade form of training – with regional level trainers reaching

woreda (district) level trainers who train the kebele level extension workers. Both woreda and health center staff are meant to provide routine supportive supervision for HEWs. UNICEF, Save the Children, A&T and other nutrition partners have provided technical assistance to the government in developing training materials for health center staff and HEWs and are also working to develop a standard set of harmonized nutrition SBCC materials to be used by government and NGOs. The HEWs reach the community through a government-led volunteer network known as the Health Development Army (HDA). Each HDA volunteer is responsible for communicating messages and mobilizing 5 households within their respective communities. There are also various forms of local community groups (community conversation groups, women's development groups and others) that are meant to extend the reach of the HEWs, both as sites for diffusion of messages and for discussion of new practices and presumably to create social pressure to adopt promoted behaviors.

The Agriculture Extension system at the kebele level mirrors that of the health extension system with the exception that Development Agents (DAs) work through Farmer Cooperative Groups, Village Economic and Social Associations (VESAs), Farmer Training Centers and other groups at the community level, rather than through the HDAs. Agriculture extension services are divided among the 2-3 DAs in each kebele and their performance is measured in large part by their kebele's agricultural yields (mainly of staple crops like teff, maize, and wheat).

The agricultural extension system also depends on a cascade system of training and supervision: The DAs provide direct assistance to farmers and pastoralists at the kebele and sub-kebele levels and are supervised by Ministry of Agriculture staff at the woreda and regional levels. Farmer Training Centers and farmer cooperatives are being scaled up again as part of AGP II and provide valuable contact points for DAs to work with farmers. PSNP IV includes new recommendations for how nutrition will be incorporated into safety net and cash transfer programs in poor woredas. Recommendations have also been put forward to government for how the new AGPII can meaningfully take up nutrition, but partners we spoke with were not sure if any of the recommendations would be adopted, nor if a new indicator for household dietary diversity would be included.

There are two ways that the DAs might be supportive of pro-nutritional practices; providing nutrition-sensitive information to (mainly male) farmers attending FTCs, Cooperative or VESA meetings, and secondly, providing technical advice and practical guidance about new farming or animal raising practices that are likely to lead to the production and consumption of more nutritious products at the household level. DAs provide technical guidance to farmers in line with annual cropping calendars. In AGP woredas, guidance is also heavily focused on increasing production of the main value chain crops (teff, wheat, chickpeas, coffee, and sesame). The recommendations paper put forward by donors about nutrition in the AGP II highlights areas where DAs could also work with farmers to increase

production, purchase, safe storage and handling and consumption of more nutritious foods.

It is tempting to consider the HEW and DA systems adequate communication channels for reaching the rural population and stimulating nutrition related behavior change. There remain three concerns: 1) the on-paper structure promises repeated opportunities for contacts with households; we don't know the extent to which this actually happens, particularly outside of the kebeles that are receiving special attention from the AGP, the PSNP, and/or NGOs; 2) both HEWs and, particularly, the DAs have many other responsibilities and it is not clear how much time they have for nutrition-focused work; and 3) their level of nutrition-specific training is quite limited and, given the complicated cascade system of training, it is not simple to provide supplementary training on a large scale.

While the success of the intensive radio media demonstration program proposed here would not hinge on the successful scaling up of existing nutrition IPC projects working at the kebele and community levels, it would endeavor to leverage and create synergies where possible (e.g., by aligning the timing and content of messages used with those being delivered through health workers, HEWs, DAs and community volunteer structures).

What sort of outside support for nutrition information through these extension systems is already in place? We do recognize that there are a variety of ongoing UN and NGO-related projects to support and raise the quality of the nutrition training and to strengthen the outreach/ interpersonal communication (IPC) work on infant and young child feeding (IYCF) done by HEWs across regions and woredas; these include the work of Digital Green and PATH to provide locally produced videos for outreach on a limited scale to farmers through the use of Pico-Projectors which display training videos filmed locally; Save the Children and other USAID Feed the Future projects (LMD, AGP-AMDe, GRAD, PRIME), Alive and Thrive, Concern Worldwide, UNICEF, the Micronutrient Initiative, CARE, World Vision, among others, are providing supplementary nutrition-related training to extension staff. A nutrition stakeholder mapping exercise was carried out by the Ministry of Health in 2014. The mapping exercise does not provide details about the projects being implemented; however, it does highlight the high concentration of nutrition partners working on IYCF in Amhara (21), SNNPR (23) and Oromiya (23).

We think that the HEW systems go impressively deep into the countryside, but given the high populations, particularly in Amhara, SNNPR, and Oromiya, and vast geography of Ethiopia, significant numbers of households remain unreached. The HEW system has been associated with some successes in improving immunization rates and increasing use of family planning methods over the past 5-10 years. Nonetheless, many people we spoke to were skeptical about the ability of the current government system reinforced by the existing UN/NGO projects to achieve sustainable improvements in nutrition outcomes at scale for two reasons: 1) they had some doubts about whether the networks worked as intended – whether the

cascade in-service training model used was sufficient for improving the outreach and counseling skills of HEWs and 2) whether the expected interactions between HEWs, HDA volunteers and mothers/caregivers happen with the frequency expected and needed. Given the very many tasks assigned to HEWs, the amount of time they would have to do nutrition-focused SBCC is extremely limited. While NGOs, represented by the ENGINE project and Alive and Thrive, are piloting some innovative ideas for strengthening nutrition IPC at the community level through the HDAs and using local NGOs who work through community groups, the scale of their IPC activities remains limited relative to the overall target population in their intervention areas.

The most extensive NGO project we learned about that is working on nutrition related to agriculture in Ethiopia was the USAID-funded ENGINE project. The bulk of its field activities are focused in 96 "productive" AGP woredas, but it also works with less food secure households in a small number of PSNP woredas. ENGINE's approach to strengthening nutrition related to agriculture involves the provision of technical assistance and training to regional, woreda, and kebele level Ministry of Agriculture staff. ENGINE's Zonal Coordinators work with government woreda staff to support and train DAs to promote more nutritious crops and to incorporate suitable nutrition messaging into their cascaded trainings with farmer cooperatives, VESA groups, model farmers and farmer training centers. The ENGINE project also includes a component which provides the most vulnerable households (e.g., with very small landholding size) with chickens, goats or heifer cows, works to connect them to sellers of high quality seeds, and is monitoring the impact of these approaches on improving nutritional status. ENGINE also provides substantial technical assistance through the health sector at the zonal and woreda levels. The main weakness of ENGINE's agriculture-based approach to improve nutrition outcomes is the limited scale of the livelihood activities relative to the number of households in need. Beyond the ENGINE project, other USAID-funded Feed the Future projects are also working to incorporate nutrition messaging into their value chain work; however, this remains at a small scale and the use of media technology related to nutrition (e.g., educational drama groups at markets) is also limited.

Proposed organization of communications intervention.
An ideal version of the program should be both operationally efficient but also take advantage of the various capacities of communication organizations already working in Ethiopia. We propose a structure involving one organization with general oversight of the program (providing technical expertise in nutrition; building links with the government at federal and regional levels; designing and managing the feedforward/feedback system and making explicit the implications of its results for producing agencies) that would chair an ongoing management committee which would include regional government representatives from health and agriculture and representatives of each of the radio producing agencies. That overall responsible institution would work with a variety of producing agencies who would take responsibility for developing and modifying the specific radio (and other

channel) messages (like those described in the final section of the report). There will be some tension in assuring that each discrete producing agency stays on message while permitting them to make full use of their own style and experiences. Still, we think it would be worthwhile to make it more likely that the messages will be appealing to a variety of audience members and to take full advantage of relevant experience and skills available in Ethiopia and elsewhere.

<u>Focus on radio</u>

The intervention we propose focuses on intense use of the radio. In choosing a communication channel, we considered the structure of the current radio system, radio's reach, particularly in rural areas, the available in-country expertise in using radio for behavior change, cost, and potential alternative channels, like mobile phones.

What does the radio system look like? The radio broadcast landscape includes three elements. There are two national radio networks as well as a government controlled radio station operating in some areas; in addition, there are some privately owned FM (referred to as community) stations with limited reach in some cities or towns.   Reception is irregular across Ethiopia's difficult and large terrain, but we were unsure as to the extent that problems with reception versus economic difficulties limited radio access among individuals. Stations broadcast in different languages with regional and community stations using local languages.

The government stations are willing to broadcast messages about health and agricultural practices. However, we were told that they have done so under two arrangements: when the sponsoring organization has been able to provide either resources or capacity building in exchange for access to air time or when air time is directly purchased. While other Ministries may have an interest in making use of radio to encourage behavior change, the Ministry of Communication and the broadcast authority operate under policy instructions of maximizing income. This is clearly a tension, particularly if there is a long term interest in taking advantage of broadcast capacity to maximize nutrition (as well as other development outcomes).

Will radio reach the rural target population? A substantial uncertainty for the proposal is about the possibility for actually achieving the needed reach and frequency with radio programming. The available data about patterns of listenership lead both to skepticism (DHS) and optimism (ERIS and Farm Radio studies). The DHS studies estimate that household rural radio ownership was at 34% in 2011 and was about the same, 31%, in 2014. Once per week listenership in the 2011 survey was at 15% among women (listenership was not asked in 2014). In contrast, a 2014 Farm Radio study put ownership among teff farmers in zones within reach of a radio signal at 66%, and an ERIS study (Audience Survey Ethiopia 2011. Ward, D., with Ayalew, S. Electoral Reform International Services, 2011) claimed that 79% of the rural population said "radio was a key source of information" with daily listenership for the entire country estimated at 60%. The

three studies clearly used quite different sampling approaches and that might explain the differences in the estimated radio access. In general the DHS surveys likely observed the most rigorous sampling procedures and should be seen as the most reliable data source. Nonetheless, its radio questions were quite limited (household radio ownership, and individual listening frequency, only in 2011). It may be that additional focused primary research on listenership may be required, both to understand what listenership levels actually are, and what stations/networks account for most listening.

Our proposal focuses on radio; what experiences does it have to build on? Our proposal focuses on the intense use of radio broadcasting for providing a variety of messages related to improving the dietary diversity of pregnant women and children under five. While there are some novel elements to the proposal, and that differentiate it from current radio activities – both in its nutrition messaging focus and in the way it would be used and monitored – it will clearly build on substantial current experience. BBC Media Action, Farm Radio International, Population Media Center and other NGOs active in Ethiopia, (DKT, PSI) each do programming where radio is central. Alive and Thrive, the Micronutrient Initiative, UNICEF supporting the Ministry of Health, Save the Children's ENGINE project and CONCERN Worldwide have also all used or are using radio (mainly spot strategies) to complement their work with health and agriculture extension agents. We present briefs describing some of these major current activities in Appendix B.

Cost of the proposed communication intervention. We have been unable to make any cost estimates for this program thus far. As with all demonstration programs there would be (1) costs associated with the special management and evaluation of the program and (2) costs associated with the ordinary operation of the intervention once it went to scale. The second category of costs would be of particular importance here since the intense radio usage and the substantial feedforward/feedback system would be more costly than currently operating programs which aim for lower levels of exposure and do not complement broadcasting with the feedforward/feedback system proposed for this work. However, it will clearly be important before committing to initiation to estimate such ongoing operational costs (specifically for airtime, for production, and for the research system) and to project what measured benefits would be required to make the case for government commitment to scaling up.

Our proposal focuses on the use of radio; but what about mobile phones? Recognizing the work being done with regards to providing technical support to the health and agriculture extension systems through IPC (described above), we then considered two paths for making use of communication technology with the main goal of increasing the number of rural households reached frequently with nutrition SBCC messages related to both health and agriculture: radio broadcasting and mobile phone-based interventions. We focus the proposal mostly on the radio version although we did explore the possibility of a mobile phone-based intervention. We noted that there has been a rapid increase in mobile phone access

in rural areas (it increased from 13% in 2011 to 40% in 2014 according to the DHS surveys).

Althiough a few organizations in Ethiopia are experimenting with mobile phone components to their interventions (e.g., Farm Radio's 'beep to vote' program and ENGINE's planned call-in IVR nutrition information platform), the most sophisticated and promising mobile phone platform is the Agricultural Transformation Agency's IVR system. The system encompasses two primary functions: the first allows farmers to call the hotline for free and listen to brief targeted messages about best practices for a given crop across the planting and harvesting and storage cycle. The second allows content experts to "push" highly-relevant and time-sensitive content to registered farmers through SMS or IVR messages. For example, one week, ATA was alerting corn farmers in southern SNNPR and Oromia about a corn blight coming in from Kenya. Currently ATA has 700,000 registered callers. In months when the hotline was heavily promoted, they received 800,000-900,000 calls and they have received a total of 4 million calls over eight months of operations from 635,000 unique callers. This is a quite intriguing mechanism for reaching audiences. However, we decided that it is perhaps not ready for direct application to nutrition. There are four current concerns: 1) While mobile phones are diffusing rapidly among households, it is not clear to what extent they are largely in the possession of men and not accessible to women; 2) While farmers may be willing to reach out to the IVR system to obtain urgent farming information concerning their current agricultural decisions, this active information seeking may not generalize to nutrition decisions if people do not already see a need to obtain nutrition information; 3) If the primary use of the ATA system in the case of nutrition would be to reach out to households with at best a passive interest in nutrition-related information, there would be a major capacity concern. Currently the ATA has only 30 telephone lines available for reaching out to farmers with urgent recorded information – it could then take a week or more to send out a single short recording to even 30,000 phones. Although the ATA is actively seeking more lines (ATA started with 6 lines in Phase I (January – May 2013), increased to 90 lines in Phase II, and is currently in the lengthy process of negotiating an additional 90 lines with Ethiotelecom), even this would be insufficient. Repeated messaging relevant to nutrition behaviors would likely be restricted to a small audience (and would in any case be competing with Ministry of Agriculture priority messages). 4) Another caveat is that even though farmers can currently call in for free, we are told that Ethiotelecom could begin charging for the service at any time. While some farmers may be willing to pay to obtain agricultural information (although even that is unclear), it is not obvious that households would pay to receive nutrition messaging.

It appears that the use of the mobile phone system as a primary channel for reaching men and women in farming households may not be promising in the short run. However, mobile phones may still be an important element in combination with the radio broadcasting intervention. A system of mobile phone informants

(whether DAs or small holding farmers) may be a valued part of the feedforward/feedback systems proposed as a component of the full intervention.

Choice of target audience

In identifying the target audience for the proposed intervention, we sought to satisfy three conditions: 1) a rural population, 2) which could be feasibly reached using a channel of mass communication, and that 3) could benefit greatly from nutrition messages. We recommend focusing on rural households that are food secure, rather than on the poorest of the poor.

What is the logic for choosing a primary target audience for the proposal?
There are several reasons for the decision to target rural food secure households rather than the poorest of the poor:

1. This group is more likely to have some discretionary income to be used for nutritional improvement, if they are persuaded of its value. For poorer people, their material circumstances, their lack of access to foods, and their lack of time to undertake recommended practices, can make adoption less feasible.
2. Nonetheless, this better-off group includes households with children at risk. Among households who are in the 2nd, 3rd or 4th quintile on the DHS wealth scale, stunting among 6-23 month olds is still high (30%). Thus this is a population worthy of attention.
3. Radio ownership and listening is also positively associated with wealth. While radio ownership among the poorest group on the five point DHS wealth scale is only 4% it goes up to 34% in the next three quintiles. This means that a radio-focused intervention designed to reach this population, will likely have an acceptably sized listener audience.

Table 2: Comparisons of radio ownership, stunting, and underweight by wealth status

Wealth status (% of rural population in category)	% radio ownership among HH with 6-23 month olds	% stunted among 6-23 month olds*	% underweight among 6-23 year olds**
Poorest [27%]	4%	41%	31%
Poorer [22%]	10%	40%	27%
Middle [24%]	37%	25%	22%
Richer [20%]	59%	24%	17%
Richest [8%]	66%	15%	6%

* stunted: <-2 SD from WHO reference height for age
** underweight: <-2SD from WHO reference for weight for age.

What are the implications of regional variation in choosing how to implement the proposed intensive radio project? Regions of Ethiopia vary sharply in population size, proportion of the population which is food secure, stunting among children 6-23 months, radio access/listenership, and involvement of NGOs already working through government structures.

We think that undertaking intervention roll-out in only one region of Ethiopia would make the most sense, since that would allow easier localization of messages, coordination with government activities, single language message production and greater evaluability, and keep air time costs lower. Criteria for choosing among regions include access to radios, limited heterogeneity of agricultural practices, substantial presence of stunting among children even though households are food secure, and prior experience of working in the region among likely implementing institutions.

In Table 1 above, we compared the 9 regions on ownership, stunting and percent of the population in the highest 3 wealth groups, including only rural households with a child 6-23 months. Based on this information, we recommended Tigray and Oromiya as possible demonstration project regions.

Appendix B: Case studies of organizations working at the intersection of communication, agriculture, and nutrition in Ethiopia

BBC Media Action Ethiopia Case Study

BBC Media Action has been working in Ethiopia since 2001. Currently, they have DFID funding for two thematic radio programs, both of which are implemented in partnership with the Ethiopian Broadcasting Corporation (EBC). The first project is part of a multi-country DFID grant to address reproductive, maternal, newborn and child health (RMNCH) issues (2013-2016). The second project, implemented under a broader Christian Aid-led consortium, is related to building resilience and adaptation to climate extremes and disasters (2015-2018). BBC Media Action's approach to the RMNCH study, which is already being implemented, is the focus of this case study.

Under the RMNCH funding, BBC Media Action is supporting a weekly radio magazine program in Amharic (*Jember*) and Afan Oromo (*Biiftuu Jireenya*), as well as public service announcements (PSAs). Both the magazine programs and the PSAs target women of reproductive age and their influencers (e.g., grandmothers, fathers, health workers) as primary audience groups. The *Jember* and *Biiftuu Jireenya* programs are 30-minute weekly broadcasts, with an additional repeat on either Saturdays or Sundays depending on the region. *Jember* is broadcast in Amhara and SNNPR on EBC and by the Amhara Mass Media Agency (the regional radio station in Amhara). *Biiftuu Jireenya* is broadcast only on the Oromiya regional radio station. The magazine programs run weekly while PSAs are broadcast 2-3 times per day for six weeks periods, and then cycle again every three months.

BBC Media Action produces its magazine programs in house and records episodes on CDs, which are then shared with the different national and regional broadcasting station staff that they train and work with. BBC Media Action works directly with government broadcasting staff; it does not currently work directly with other implementing or technical sub-partners on this project. Air-time for the magazine programs and PSAs is provided free of charge by the EBC and regional stations in exchange for capacity building services provided to the broadcasters by the BBC Media Action staff.

Seven RMNCH thematic topics are prioritized for the radio magazine programs, each of which has specific behaviors to address through the drama dialogue. The topics include: antenatal care (ANC) and care during pregnancy, birth preparedness, safe delivery, danger signs for mother and baby during pregnancy, labor and during the post-partum period, newborn care, breastfeeding, family planning and birth spacing. The PSAs are focused on two of the above topics (improving ANC attendance and birth preparedness).

A participatory style is used for the magazine dramas whereby actors present arguments for both positive and negative behaviors, allowing listeners to then come to their own conclusions and make informed decisions. The effective assumptions in the design of BBC Media Action's RMNCH project are that by raising awareness and modeling appropriate behaviors for the audience, mothers and other caregivers will become more informed about safe practices during pregnancy, delivery and post-partum, and will choose to undertake those practices. The approach to the magazine program relies on social diffusion (e.g., that "influencers" who hear the magazine program and PSAs will pass the message along to pregnant women), and also assumes that a small amount of exposure is enough (i.e., magazine knowledge/behavior change topics may only be repeated for the audience once every 12-16 weeks). The PSAs provide more frequent and focused messages on ANC and birth preparedness to help push harder for behavior change in those two specific areas.

In terms of monitoring and evaluation (M&E), BBC Media Action has conducted an initial formative study (March 2012), a baseline study (December 2012) and a qualitative study (November 2013) for the RMNCH project. A Reach Impact and Outcomes (RIO) Study was also carried out in 2014, and plans are in place for a mid-term evaluation in 2015 and a final project evaluation in 2016. The formative research conducted was designed to inform the key topics covered by the magazine programs; however, the episode content also appears to be strongly influenced by the project's overall seven communication objectives/topics for RMNCH and the ideas of the creative script writers and production teams.

In terms of reach, the RIO report found that the program reached 3.8 million regular (twice a month) listeners across three regions (or 10% of the estimated total adult audience in the target regions). The report showed listeners were more educated than non-listeners. The report indicated that some listeners attributed improved knowledge of recommended practices and changed practices to listening to the program; a smaller proportion claimed to have advised others about antenatal and birth practices as the result of campaign listening. A midline survey was being conducted in February 2015; however, establishing the independent effects of the media programming is complicated by the fact that other RMNCH projects are operating in the same woredas. These other RMNCH projects may also have had an effect on increasing knowledge or improving some of the behaviors observed.

Alternative media approaches have not yet been included in the RMNCH project, such as using mobile phones for data collection or for sharing information, however their feasibility is being explored by BBC Media Action Ethiopia.

FHI360: Alive & Thrive Case Study

FHI360's Alive & Thrive project is a BMGF funded program to improve IYCF practices in Ethiopia and, ultimately, to reduce stunting. The project is now entering Phase II (mid-2014 through mid-2017), building on lessons learned in Phase I (July

2009 through April 2014). In Phase I, the project involved nutrition advocacy at the national and regional levels, interpersonal communication and social mobilization in four regions (Tigray, Amhara, Oromia, and SNNPR), mass media (subcontracted radio and television spots targeting male involvement in IYCF), and strategic use of data. Phase II will use similar strategies but only in the Amhara region and with an even more focused set of IYCF messages for complementary feeding (specifically, appropriate and timely CF feeding and dietary diversity).

The core of A&T's interpersonal communication program in Ethiopia is a well-designed strategy that builds the capacity of the Health Extension Workers (HEWs) and Health Development Army (HDA) volunteers and uses various teaching aids to communicate small do-able actions related to IYCF to mothers of children under two. This teaching aid is supported by a child nutrition card that is given to each household with children under 2 and allows parents to track their own progress towards carrying out the specific actions around breastfeeding and complementary feeding. The materials have been adopted by a number of organizations who work on similar issues including UNICEF, Save the Children, and Concern Worldwide. This is an important contribution because there is an expressed need for standardized nutrition teaching aids for HEWs and HDAs. Ultimately, the goal is for the Ministry of Health to adopt these materials.

Preliminary results of A&T's phase I evaluation showed that attendance at cooking demonstrations were much more likely to yield greater awareness and adoption of infant and young child feeding practices and there are plans to increase the role of cooking demonstrations in Phase II based on the lessons learned from Phase I. In addition, Phase II may have a community theater component.

Although A&T Ethiopia did conduct some targeted radio and television spots in Phase I, mass media was not a central component of the intervention. There are plans for a more intensive radio strategy in Phase II to celebrate successes (positive role models, testimonials, etc.) and to reinforce the key nutrition behaviors through intensive use of spots (rather than long-form programming).

A&T Ethiopia adopts an explicit BCC strategy in which small-doable actions are paired with motivation to perform those actions, for example, the promise of having a smart and successful child or community recognition for having carried out the seven excellent feeding actions.

Lessons learned from Phase I include that fewer women were reached by HEWs and HDA volunteers than expected. The project estimates that about 1.5 million mothers across the 295 intervention woredas were reached through HEWs or HDA volunteers (48% of the target audience) at home. During the same period, an estimated 960,000 women (below 30%) reported hearing A&T radio spots.

A&T conducted formative research on IYCF practices, beliefs, and influences in SNNPR and Tigray and a rapid assessment to identify suitable formats and channels

for SBCC. The formative research was conducted through maternal interviews and observations, focus group discussions, and interviews with HEWs and HDA volunteers. The discussions identified gaps in knowledge, misconceptions, harmful practices (like waiting too long to introduce CF and not continuing child feeding during illness), and important influencers which then informed the development of the intervention (IYCF Practices, Beliefs and Influencers in Tigray Region, Ethiopia, 2010; IYCF Practices, Beliefs and Influences in SNNPR Region, Ethiopia, 2010).

The rapid assessment was conducted through 24 separate focus group discussions with mothers, fathers, HEWs and HDA volunteers and helped shape the A&T program, for example, the need for additional training and BCC materials and the use of interpersonal counseling and community conversation/mobilization as a primary channel (Infant and Young Child Feeding in Communities: A rapid assessment in Tigray and SNNPR, Ethiopia, 2010).

The formative research was used to prioritize and contextualize the WHO essential nutrition actions into seven small do-able actions that form the core of the A&T message strategy.

In terms of monitoring, the A&T program in Ethiopia has a community mobilization component in which kebeles set targets for earning, for example, 200 smart and strong certificates (awarded to parents who have made an effort to adopt the seven excellent feeding actions). This doubles as a monitoring tool. In addition, once every year, three kebeles were randomly selected out of 100 for additional monitoring activity (sentinel sites approach). Phase II will include more routine monitoring tools like regular review meetings with community partners, attendance at various community gatherings, and information collection on the number of contacts between a mother and a HEW and HDA leader.

The A&T project was accompanied by a rigorous external evaluation. IFPRI conducted baseline (June-August 2010), midterm (June 2012 and June 2013), and endline (August-October 2014) surveys for Phase I of the A&T project in Tigray and SNNPR, the two regions where activities were rolled-out first. In the baseline, 3,000 households with children under the age of 5 were surveyed. The data from the endline survey are not yet publicly available, but preliminary results indicate that the period of Phase I operations was associated with improved sustained rates of EBF (72% to 80%) and improved rates of dietary diversity (6% to 13%) and minimum meal frequency (45% to 70%).

IFPRI will also conduct baseline and endline evaluations for Phase II.

Digital Green Case Study

Digital Green is using battery-operated pico projectors and speakers to disseminate locally produced short instructional videos to help agricultural and health extension

workers (DAs and HEWs, respectively) better communicate improved practices. The videos are highly specific to the local context. Sometimes the focus of the content is driven by the type of crop being promoted, as in the case of quality protein maize (QPM), and sometimes it is driven by the agenda of the Ministry of Agriculture and Regional Agricultural Bureaus working through DAs, as in the case of a short video on effective localized composting techniques.

In addition to working on agriculture-content programming, Digital Green is also using pico projectors in collaboration with PATH Ethiopia, Health Extension Workers, and women's groups to reach mothers with health and nutrition messages in a small number of woredas.

The 8-12 minute videos are produced locally (at the woreda (district) level), showcase an instructional best practice, and feature model farmers or mothers who have adopted recommended behaviors. Each video is then included in Digital Green's video library which is accessible to other trained DAs and HEWs. The videos are screened during meetings of groups of 15-20 farmers or mothers and are used as a training and discussion aid to facilitate adoption of best practices.

The approach is highly participatory and reflects the underlying assumptions that individual empowerment, modeling of recommended behaviors, social networks, and group discussions and norms are particularly powerful drivers of change.

Digital Green is working in four regions, Amhara, Oromia, SNNPR and Tigray in partnership with the Ministry of Agriculture (MOA) and the Agricultural Transformation Agency (ATA) and a number of organizations including Oxfam America, Sasakawa Africa Association, iDE Ethiopia, PATH, and AGRA. Additional collaborations with Farm Radio International and others are in the planning phases as Digital Green embarks on synergizing multiple ICT platforms to gain wider reach.

The interventions were relatively small-scale until the cropping season of 2014 (the iDE irrigation project had a target of 3,150 households (HH), the QPM project, 3,000 HH, the maternal and child health project, 4,000 HH). However, during the 2014 cropping season (May – October), Digital Green engaged approximately 23,000 farmer households through their approach, working in close collaboration with the MoA and partner organizations. The larger BMGF and USAID projects that Digital Green is currently implementing have an expected reach of over 1 million farmers through multiple ICT platforms and embedding the Digital Green approach into the government's agricultural extension system.

A single video may be shown to a group of farmers multiple times depending on the interest of those involved in the viewing groups. The groups meet every two weeks.

Because Digital Green's operational model is so localized, it does not involve a great deal of formative research. Intervention locations are identified in collaboration with the partner and the government and then the content is developed in

collaboration with community members to ensure that it is specific and relevant to the community.

Digital Green has developed an open-source data management framework called COCO (Connect Online, Connect Offline) which allows relational data to be captured and analyzed in locations with limited or intermittent Internet connectivity. The feedback and data captured by these systems assist in targeting videos based on location- and time-sensitivities as well as a partners' existing interventions.

Attendance is taken during each dissemination and at the end of the discussion, attendees are asked whether they are interested in adopting the recommended practice. The facilitator (the HEW or the DA) then follows up with interested participants and provides additional support. In addition, the facilitator asks whether participants have adopted practices covered in previous screening and verifies adoption during follow-up observational visits. For behaviors that cannot be directly observed, for example certain health practices, facilitators interview the person and complete an adoption checklist. Questions, feedback, and levels of interest and adoptions from farmers are entered into COCO by the woreda-level ICT officers after each facilitator turns in the relevant documentation.

Digital Green is currently undertaking an RCT in India to evaluate the effectiveness of their approach and, in Ethiopia, a process evaluation will be conducted by IFPRI in year 1 and an RCT is planned for year 2.

Farm Radio International Case Study

Historically, Farm Radio International (FRI) has focused on disseminating agricultural technologies and best practices, but recently FRI has also done a number of radio campaigns related to nutrition in Ethiopia and elsewhere. They are currently conducting the outcome evaluation of a CIP (Irish Aid/USAID) funded Orange Fleshed Sweet Potato (OFSP) Project in Ethiopia. The objective of the intervention was to encourage both cultivation and consumption of OFSP among rural populations. FRI has also been working with CIMMYT to promote the cultivation and consumption of Quality Protein Maize (QPM). In addition, FRI has received funding to disseminate the latest technologies for nutrition sensitive cropping, an example of which is pest management in lentil and chickpea crops which are key sources of protein often grown and prepared by women.

FRI's expertise is in Participatory Radio Campaigns (PRC) "designed to help farmers mobilize to adopt a specific farming practice or improvement" (Teff Outcome Evaluation Report, 2015). Farmers are involved in every step of the process from selecting the topic, discussing the pros and cons of adoption, making an informed decision to adopt or not, and providing practical feedback throughout the process of adoption. The campaigns typically follow a 12-16 week format with magazine style programs (30 minutes each) that are broadcast live weekly with one repeat

broadcast later in the week. Depending on the topic, there may be additional campaign bursts and/or an echo campaign which is a series of radio programs particularly designed to engage farmers who did not adopt the practice after the initial PRC.

In addition to the radio, FRI uses community listening groups and ICTs to boost the interactivity, reach, and accessibility of PRCs.

FRI works with local broadcasters providing training in FRI's PRC method. The local broadcasters then produce the magazine programs with the support and guidance of FRI's staff. FRI monitors both the content and the voice of the programming to make sure it meets FRI's quality standards.

The magazine programs embrace a variety of formats including mini-drama, live discussion, interviews, mini-documentary, music, storytelling, studio discussion, field discussion, vox box (electronic receptacle for audience feedback) and vox pops (random subjects are asked to give their views on a particular topic and their responses are presented to the listeners as a reflection of popular opinion).

FRI collaborates with local radio stations by providing training, capacity building, and sometimes equipping offices especially for the use of ICTs. In addition, they sometimes contribute to air time and production costs.

The FRI model is one of provision of information as opposed to persuasion; FRI believes in providing audiences with all the necessary information to make an informed decision. For example, for promoting QPM, FR used the first year of the project to educate the target audiences on concepts related to nutrition and protein given their limited prior understanding of these issues.

In Ethiopia, FRI works with the regional broadcasters in four regions: Amhara, Oromiya, Tigray, and SNNPR.

To estimate the potential reach of their programs, FRI has begun overlaying GIS topographical maps with population data and the power of a particular broadcast signal.

FRI tends to ask farmers about listenership and access rather than about ownership, asking, for example, about exposure to the most recent FRI broadcast in the area: How often do you listen? How many episodes have you heard? Although people may be listening to the radio on their cell phones, FRI does not have data to indicate what percentage of listeners are listening on cell phones.

When approached by a partner, FRI first conducts audience research to understand the farmers' knowledge, attitudes, and practice related to the content area and to understand the target audiences' media habits – radio listenership, mobile phone

use, etc. This is often achieved through focus groups with members of the target audience in several target communities.

FRI also works closely with knowledge partners who define the core content which is then adapted to the local context based on a process of dialogue with the relevant stakeholders (farmers, knowledge partners, broadcasters, and FRI). After conducting audience research and training the broadcasters for 2-3 weeks in the content area, farmers, knowledge partners, broadcasters, and FRI come together to design the programming in detail over the course of several days.

All FRI programming is targeted towards specific measurable outcomes, for example, increases in knowledge, attitudes, or practice. FRI uses listening groups, ICTs, and the production process to obtain audience feedback and thereby monitor and adjust ongoing programming.

FRI prefers to conduct an outcome evaluation for every campaign but this hinges on donor support. FRI's outcome evaluations are typically conducted internally and involve face-to-face surveys with a random sample of community members using a mobile phone platform (Mobenzi mobile survey software). Often the analyses compare listeners with non-listeners.

In a recent report on teff row planting in Ethiopia, FRI concluded that 2.4 million adult listeners were exposed (at all) to their radio broadcasts, and ¾ million households adopted improved planting practices.[14]The study compares teff farmers in listening communities (communities with reception of the broadcast signal) to teff farmers in non-listening communities. They found that 81% vs. 6% were aware of the PRC program, 79% vs. 5% listened to at least one PRC broadcast, knowledge quiz scores were 76% vs. 58%, 77% vs. 32% planted teff seed in rows (outcome behavior), and they found a dose-response relationship between number of episodes listened to and planting teff in rows. They estimate that one third of the 2.2 million farmers that adopted teff row planting can be attributed, at least in part, to exposure to the radio programming. It is possible that there were other differences between the high and low listening regions (in terms of other farmer characteristics or presence of other interventions) that may be rival explanations for the differences.

FRI has experimented with the use of ICTs. In Ethiopia, they use a "beep-to-vote" technique to get feedback from the audience on yes/no or true/false questions or to gauge interest, for example, "beep if you plan to adopt teff row planting." This

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[14]The survey respondents in this study were much more likely to own and listen to radios (89% in the region with access to the broadcasts) compared to DHS estimates of ownership (30% for all rural areas of the country). We do not know what accounts for the difference—sampling procedures or differences in questions – but it does suggest that the samples studied here may not represent the Ethiopian rural population.

technology has been made available to the regional broadcasters so that they can report and respond to results in real time. FRI also has an Innovation Lab in Tanzania to test new ICTs.

Population Media Center Case Study

The Population Media Center (PMC) was founded in Ethiopia in 2000 to create a research and evidence-based communication strategy for addressing priority health issues in Ethiopia. They worked closely with concerned government agencies to draft the first National Health Communication Strategy and the HIV/AIDS Communication Framework for Ethiopia. They continue to work closely with the government and other key stakeholders to define the priority issues and produce content. PMC has worked extensively on a wide variety of topics including family planning, HIV/AIDS, alcohol and substance abuse, harmful traditional practices like early marriage and female genital mutilation, child labor, and fistula.

PMC is well-known for its radio dramas that follow the Sabido method of entertainment education and use positive, negative, and transitional role models to illustrate behavior change and the positive and negative consequences of specific actions. In addition to radio dramas, PMC also frequently uses magazine style radio programming or talk shows which permit dialogue between the target audience and subject matter experts. They have also produced 11 volumes of real life stories that are distributed and read on radio stations. Finally, another central component of PMC's communication strategy is advocacy and the training of more that 2,700 change agents including religious leaders, clan leaders, women and youth leaders, teachers, health extension workers, and journalists and media practitioners, from all regions of Ethiopia. Additional strategies include spots, mini-media (e.g. with youth clubs at schools), leveraging existing interpersonal communication networks (HEWs, DAs), and billboards at market places.

To date, PMC has broadcast radio dramas primarily in Amharic on the national radio station, Ethiopian Broadcasting Corporation (EBC). However, they also use regional radio stations and have broadcast in Amharic, Oromiffa, Somali, and Afar languages. PMC draws on a variety of local resources including professors and doctoral students at the Addis Ababa University and the Central Statistics Agency to conduct formative research. The formative research is comprised of a review of the available literature on the content area (e.g. nutrition and communication), a rapid assessment, and an analysis of any evidence available at the national level from government ministries or NGO partners. The results of the formative research are used to identify opportunities for communication interventions and for the training of journalists, script writers, and program producers working with PMC. A consensus building meeting is then held to give all the relevant stakeholders an opportunity to shape the intervention.

After the consensus meeting, the independently contracted script writers (currently four individuals who have degrees in literature, have been trained by PMC in the Sabido methodology, and have been collaborating with PMC for 12 years) are trained for a couple of weeks by an expert in the content area (e.g. a nutritionist). They are provided with insights from the formative research on relevant knowledge, attitudes, and practices and then they travel to the target regions and spend a minimum of one month living among the target audience. Upon their return, they write a storyline. The storyline is vetted by PMC and other communication partners. The entertainment value is judged by a jury who provide feedback to the scriptwriters. If necessary, the storyline is rewritten and then the scriptwriters produce the plots, striving for a balance between entertainment and education. The programs are then pretested in the target regions before they are produced. PMC partners with broadcasters and engages in capacity building to ensure quality production.

The only work that PMC has done in nutrition is a current UNICEF drama that incorporates a number of health content areas. The UNICEF program airs two episodes a week with two repeats (for a total of four 27-minute broadcasts each week and 208 distinct episodes). Most of PMC's programs consist of between 160 and 257 distinct episodes (not including repeat broadcasting).

For monitoring and evaluation purposes, with the current UNICEF program, PMC has organized 150 listener groups (10 people in each group from across the target broadcast areas) and provided them with wind-up radios. Each week, the listener group listens to the drama and responds to a set of 16 questions on everything from radio reception to entertainment value to understanding of core messages. With each intervention, PMC conducts midterm and post-intervention evaluations and compares outcomes to pre-intervention benchmarks.

Quantitative before-after surveys were conducted to evaluate the effects of two radio serial dramas aired between 2002 and 2004 and a radio serial drama aired between 2005 and 2007. Controlling for a number of confounders, these evaluations found advantages for listeners (compared to non-listeners) on knowledge, spousal discussion, and use of a modern contraceptive methods, knowledge and discussion of HIV and other STIs, and HIV testing. In addition, in 2004, 18% of the 14,400 new reproductive health clients interviewed at 48 clinics spontaneously named one of PMC's programs as the primary motivating factor for seeking services.

Save the Children Ethiopia: ENGINE Project Case Study

The Feed the Future ENGINE project – Empowering New Generations in Improved Nutrition and Economic opportunities – includes a number of SBCC components in its strategy to improve nutritional status in 'productive' woredas in Amhara, Oromiya, Tigray, Somali and SNNPR.

The initiative of this five year project (2011-2016) is to prevent undernutrition during the first 1,000 days by focusing on social and behavior change communication (SBCC) including linkages to livelihood and economic strengthening. The project's aim is to strengthen capacity for and to institutionalize nutrition programs and policies; improve the quality and delivery of nutrition and health care services; and prevent undernutrition through improved community-based nutrition care practices.

ENGINE has provided technical assistance to government at the national, regional, and woreda levels. ENGINE is involved in advocacy and capacity building at the national level targeting policy makers (Ministry of Health, Ministry of Agriculture, parliamentarians) and religious leaders. They have worked to integrate nutrition into the government's primary agricultural programs – the Agricultural Growth Program (AGP) and the Productive Safety Net Program (PSNP). At the regional level, ENGINE works with various government bureaus including health, agriculture, education, and women, children and youth affairs.

To strengthen pre-service education and in-service training in nutrition, ENGINE, led by Jhpiego and working through the Nutrition TWG, works with the Ministry of Education, the MOH, public universities, and colleges to review and update existing pre-service nutrition curricula. In addition, ENGINE has developed competency based teaching and assessment tools such as learning manuals, job aids, checklists, and nutrition lecture materials. A quality improvement component has also been developed by ENGINE to maintain teaching quality of health workers.

In terms of SBCC, through collaboration with local NGOs, the ENGINE project is piloting community-level interpersonal communication approaches using two models of community conversation groups with the intention of evaluating which type is more effective in changing behavior. The more widespread version (116 woredas) involves the facilitation of community conversations using structured modules and the aid of flip charts and games. The "enhanced" community conversation (21 woredas) follows the same structured model, but in addition to the flip-chart, the session is led, in part, by a virtual facilitator through a portable audio player and pre-recorded sessions saved on a memory card. These community conversation groups are organized at the community level around three primary target audiences: pregnant and lactating women, fathers, and grandmothers.

ENGINE has also used an m-nutrition platform to reach agricultural extension workers (DAs). The pilot involved 250 DAs who were sent a text message each week for 12 weeks with brief nutrition related content and a number they could call for more information. If interested, the DAs could pay for the call to listen to a pre-recorded IVR system that provided additional information in Amharic. There were 450 calls over the course of the pilot, or around 1.8 calls per DA.

ENGINE also experimented with a radio magazine program developed by JHU CCP. In the future, they will build off the lessons learned (including the need to partner with whichever radio station gets the most reach in the target area, the importance of airing the program at a convenient time, and the need to improve the entertainment-value) to design, in-house, a continuation of the radio magazine program that will be produced by a broadcasting partner and aired once a week. To understand the media environment and the radio listening habits of their target audience, ENGINE conducted a pre-program listenership assessment which was used to decide when and where to broadcast the radio magazine program.

Finally, in terms of SBCC, ENGINE has worked in markets to cue better nutritional decisions at the point-of-purchase by designating vendors who sell one or more of ENGINE's designated "star foods" with banners and by strategically placing billboards to remind parents which foods they should purchase for their children. Through the community conversations, ENGINE expects to reach approximately 25,000 members of the primary target audience (137 woredas x 4 kebeles per woreda x 9 community conversation groups per kebele x 20 people per community conversation group = 24,660). The facilitators of the community conversations encourage participants to transmit their learnings to another 5 community members, or the secondary target audience, thereby snowballing the effects of the intervention.

Through the targeted work with vulnerable households (in which ENGINE provides agronomic inputs like seed and chickens, small livestock and agricultural and nutritional advice), ENGINE is reaching a further 16,000 households.

The ENGINE project conducted formative research to explore questions related to nutrition and to barriers and facilitators to performing the recommended behaviors which was used to develop the community conversation approaches, messaging, games, etc. The project also conducted a cultural inventory to anchor their SBCC materials in the Ethiopian context and pretested initial concepts with the target audience. The implementation/piloting of the community conversation SBCC component of the ENGINE project was only initiated in mid-2014 (three years into the project) – this was due in part to a change-over in its technical sub-partner who was leading the SBCC work.

The ENGINE project builds monitoring into the community conversations by following-up with questions about adoption of behaviors covered in prior modules, for example: "How many of you built a tippy-tap?" They are also currently collaborating with Manoff Group to develop a system for assessing the effectiveness of their SBCC interventions. ENGINE is one of the projects in Ethiopia that has most extensively attempted to integrate agriculture and nutrition.

Development Media International Case Study

Development Media International (DMI) started its ambitious randomized control trial in Burkina Faso in 2011 – out of 140 radio stations, they selected the 14 zones with the highest penetration and listenership. To define their clusters they used digital terrain mapping and radio signal propagation modelling, combined with a more prosaic "motorbike survey" in which they drove motorcycles 50 kilometers away from each of the 14 radio stations in each of 5 directions, stopping every 5 kilometers to test the strength of the radio signals, they randomly assigned 7 intervention and 7 control sites.

DMI carefully forged relationships with each of the intervention radio stations by evaluating their strengths and weaknesses and assessing their needs. The objective was to create partnerships, not just engage in a monetary transaction, and, through the development of interesting and entertaining programming, to make the intervention stations the most-listened to stations in each area. The stations received infrastructural improvements and monthly stipends (which varied from station to station), but also training, ongoing supervision and support (someone from DMI visited each of the stations every two weeks or so), two stations received solar energy installations, and two others diesel generators; DMI hired a full-time staff person for the two stations in need of the greatest support.

In exchange, the radio stations agreed to air ten one-minute spots every day for the duration of the trial (3 years) and a two-hour live interactive radio program five days a week in the most-listened-to evening slot. The interactive program was not devoted uniquely to the 12 child and maternal health messages that form the core of the campaign; instead, it was designed to maximize the entertainment value. In each two hour period, two carefully crafted 10-minute maternal and child health radio skits were featured. The skits were written by DMI's script writers (in French) in Ouagadougou and then sent to the partner stations to be performed live, in local languages, every day by local talent. A great deal of monitoring and capacity building was involved in training actors to bring the skits to life. Almost all programs included live call-in components.

The spots were written in Ouagadougou by DMI's talented team of script writers, acted and brought to life by members of the DMI staff and other members of the community (a building security guard, someone's mother-in-law, etc.), and distributed to each of the radio stations on memory sticks.

The process to create so much content (140 spots in 6 languages and over 950 skits) evolved over time, but it begins with the creation of message briefs composed of epidemiological information around the target behavior, insights from formative research including levers and barriers to behavior change, and key messages. Over the course of three weeks, the scriptwriters each write one or two spots, the spots are shared with the rest of the DMI team and the best ones are sent to the DMI office in London for comment. Six spots are then produced in two languages and

pretested. The results of the pretest are incorporated and the 4 best spots for that health topic are produced in six languages and sent to the participating radio stations.

Branded by DMI, the Saturation+ model expects to reach each member of the target audience several times a day by airing 10 one-minute spots 7 days a week and two ten-minute skits 5 days a week continuously for three years. At the midline, 75% of women interviewed in the intervention areas reported recognizing the campaign's radio spots (branded by a child's laugh at the end of each spot). The DMI Burkina campaign is probably the most intensive health communication campaign ever conducted for child survival.

DMI Burkina's research team, composed of two sociologists and one social psychologist, conduct in-depth formative research on each of the target health topics through guided focus groups with men (separately), women (separately), and a mixed group of others (12 people in each focus group). In addition, they conduct individual interviews with key members of the community including health workers. The findings from the formative research are shared via a (deliberately) short written report and verbal debriefing with the script writers. Once the 6 semi-final spots have been selected, reviewed, revised and produced in two languages, the research team (often with at least one script writer) pretest the spots with three focus groups to investigate basic comprehension, message recall, persuasiveness, whether the portrayal is realistic, and spot ranking (most liked). The research team presents the feedback to the script writers for final revision before the 4 best spots are produced in six languages.

Monitoring and surveillance takes place through message pretesting and regular feedback research, after the spots are broadcast, to understand the audience reaction, message retention, discussion about the health topics highlighted in the spots, and behavior change. Both research activities are conducted through focus groups and individual interviews with key informants like health workers. In addition, the research team also actively investigates other maternal and infant health activities taking place in the DMI intervention and control areas so as to better understand potential confounding factors. Finally, staff from DMI regularly visit each of the intervention radio stations to provide ongoing guidance and support (about every two weeks).

The DMI RCT in Burkina Faso is being evaluated by the London School of Hygiene and Tropical Medicine using a repeated cross-sectional cluster-randomized design at baseline, midline, and endline with a large sample at endline powered to enable possible detection of child mortality effects. The results of the midterm evaluation, focused on behavior change, are in the process of being analyzed and written-up for publication.

The first phase of the DMI Burkina Faso project focused on maternal and child health messages including malaria, pneumonia, acute respiratory infection, hygiene,

maternal and neonatal health (delivering in a health center, antenatal care), low birth weight babies, nutrition (early initiation of BF, EBF, CF, infant growth monitoring) and family planning. The second phase of the campaign, funded by Alive & Thrive and SPRING (separately), will focus more on exclusive breastfeeding (Alive & Thrive) and maternal nutrition and complementary feeding (SPRING). The organization Comic Relief will also be funding a national campaign on treatment seeking for malaria, pneumonia, and respiratory infections. Vitol Foundation is also providing some additional funding.

In addition, with funding from a Gates Grand Challenges award, DMI Burkina has created 8 short films on various maternal and child health topics to be viewed and shared via cell phones in one of the areas of Burkina Faso with very low media penetration and high linguistic diversity. After producing the short films, they distributed 3 films to each of 80 distributors across 8 villages and are now tracking the spread of the films. The purpose of the activity is to see whether the demand for local audiovisual content – in areas where no such films have ever been produced in local languages - can cause health-related videos to "go viral" and therefore expand the reach of health messages in media dark and linguistically diverse areas.

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