Harmonizing nutrition behavioural change communication materials using the Ethiopian Food-Based Dietary Guidelines: A scoping review

Recommendations to harmonize the current nutrition behavioural change communication materials in line with the 2022 Ethiopia food-based dietary guidelines

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RAISE-FS working paper # 017

WAGENINGEN UNIVERSITY & RESEARCH

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Ethiopia faces challenges related to inadequate micronutrient intake and low consumption of nutrient-rich foods, contributing to malnutrition and non-communicable diseases. Despite efforts in nutrition behaviour change communication, dietary diversity remains limited, necessitating innovative approaches. In response, Ethiopia has introduced the Food-Based Dietary Guidelines (FBDGs) to promote healthier dietary practices. The Resilient Agriculture for Inclusive and Sustainable Ethiopian Food Systems project (RAISE-FS) aims to transform the food system through Research for Food System Transformation (R4FST), supporting the government's agenda for transformation. This working paper which is a result of a scoping review highlights that nutrition social behaviour change communication (SBCC), integral to the RAISE-FS project, should adhere to behaviour change principles while implementing the FBDGs.

Keywords: Food-Based Dietary Guidelines, behaviour, communication, food system, transformation, Ethiopia

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List of abbreviations and acronyms

BCC	Behaviour change communication
(S)BCI	(Social) Behaviour change intervention
BMI	Body mass index
COM-B	Capacity opportunity and motivation for a specific behaviour
EFBDGs/FBDGs	Ethiopian Food-based dietary guidelines/ Food-Based dietary guidelines
HEW	Health Extension workers
HH	household
IYCF	Infant and young child feeding
MOA	Ministry of agriculture
RAISE-FS	Resilient Agriculture for Inclusive and Sustainable Ethiopian Food Systems
SBCC	Social behaviour change communication
UNICEF	United Nations Children's Fund
USAID	United states agency for international development
WASH	Water, Sanitation and Hygiene
WUR	Wageningen University and Research

Definitions

Behavioural Change Communication: is a collection of communications approaches, activities, and tools used to positively influence behaviours (Menon et al. 2014). It is an evidence-based strategy to help improve health and nutrition outcomes. When well implemented, BCC is an important component in interventions where behaviour change is needed for improving nutrition. BCC activities are numerous, yet typically characterized into three broad categories: interpersonal, media, and community mobilization.

Ethiopian Food-Based Dietary Guidelines: (also known as dietary guidelines) are intended to establish a basis for public food and nutrition, health and agricultural policies, and nutrition education programs to foster healthy eating habits and lifestyles. They provide advice on foods, food groups, and dietary patterns to provide the required nutrients to the public to promote overall health and prevent chronic diseases.

A healthy diet: can be defined as a dietary pattern that effectively fulfils the requisite energy and essential micronutrient needs of an individual. It encompasses a wide range of diverse food sources to ensure a balanced intake of vital nutrients. Furthermore, a healthy diet aims to harmonize the sources of energy to align with the optimal nutrient intake, all while upholding principles of moderation. This moderation extends to encompass factors such as the degree of food processing, thus promoting a diet that adheres to nutritional guidelines for overall well-being.

Nutrition counselling: A process by which a health or agriculture professional with special training in nutrition helps people make healthy food choices and form healthy eating habits.

Summary

In Ethiopia, inadequate micronutrient intake, and low consumption of micronutrient-rich foods including fruits, vegetables and animal-source foods, contribute to malnutrition and non-communicable diseases. It is widely recognized that nutrition behavioural change communication can contribute to promoting healthy dietary behaviours and addressing malnutrition. However, despite years of nutrition behaviour change communication programming, dietary diversity remains low. Innovative behaviour change communication programs are needed to support improved dietary practices. To address these challenges, Ethiopia has recently launched the Ethiopian Food-Based Dietary Guidelines (FBDGs). Resilient Agriculture for Inclusive and Sustainable Ethiopian Food Systems programme (RAISE-FS), which seeks to bring about transformation in the Ethiopian food system. RAISE-FS will develop and implement a demand-driven and interdisciplinary approach to Research for Food System Transformation, and as such, contribute to the Government of Ethiopia's transformational agenda. This report explores how to ensure that food systems transformation leads to improved dietary practices.

The overall aim of this scoping review is to ensure that the nutrition social behaviour change communication (SBCC) programming delivered through the RAISE-FS project, which will focus on the implementation of the Ethiopian Food-Based Dietary Guidelines, is guided by underlying principles of behaviour change.
More specifically, this report aims to identify key underlying principles and theories of behavioural change and how they can be used for the development of effective nutritional behaviour change communication.

This will be translated in the RAISE-FS context by reviewing and synthesizing quantitative and qualitative baseline data from the RAISE-FS project relevant to informing nutrition-related BCC materials. Bring together findings from the first two objectives to recommendations for how to approach the development of nutrition-related SBCC within projects like the RAISE-FS program.

Finally, the report will briefly consider the broader external context by evaluating the existing BCC materials, and delivery approaches found in documents endorsed by the various ministries of the Ethiopian government (Agriculture, Health) and selected development partners, in terms of their alignment with the Ethiopian Food-Based Dietary Guidelines (EFBDGs) and BCC principles.

Underlying principles and theories of behaviour change communication were identified through a desk-based literature review. To answer the second question, a baseline survey was carried out between 15 June and 2 August 2022. Quantitative data was collected from 918 randomly sampled respondents (306 respondents from Amhara, 307 from previous SNNP, and 306 from Oromia). A rapid food system assessment was also implemented in the 3 regions, including data from 9 *woreda*s. The rapid food system assessment collected data on the perception of healthy diets and how these differ from what people consume, for a full description of the methodology. To explore which of these factors are most dominant in shaping food choice behaviour in one intervention *woreda*, Boloso Bombe, a survey was conducted, and two expert interviews were organised. Bringing together these three data points, the report considers how to make the nutrition BCC messages delivered through the RAISE-FS project more impactful, based on current dietary patterns, as well as gaps. Finally, we considered existing materials produced by both government and development partners (n=24), and how these can be adjusted to support alignment with the EFBDGs.

The key findings highlight that social and behaviour change communication (SBCC) approaches, particularly those which aim to influence both social as well as individual behaviour, should be context-specific, theory-based, and use multiple communication channels. The RAISE-FS baseline, rapid food systems assessment, and focus group discussions on key behaviours influencing food choice found that, overall, people are aware of what makes up a healthy diet, but there are also significant region variations. For many food groups, such as animal-source foods, nutrition messaging alone may not be enough to significantly impact dietary behaviour. People are aware that certain foods are nutritious, but they are unable to regularly consume them, suggesting factors like food availability, and affordability are more limiting than knowledge. Based on the desk-based research and baseline data collection, a guide to influencing behaviour change communication has been developed. This guide includes a 6-month SBCC intervention on the EFBDG pilot activities in RAISE-FS project which includes both key messages and activities to enforce these messages. The assessment of various behavioural change communication (BCC) materials from different sectors and organizations in Ethiopia

revealed that many of these materials do not provide specific dietary advice in line with the current Food-Based Dietary Guidelines (FBDG). Some documents offer broader information on nutrition, gender, and social development, often linked to key development programs such as the PSNP program, while others focus on pregnant women and children under 2 years of age. Among the existing materials, certain documents show promise for promoting certain nutrition activities. These include the Dietary Diversity materials from the Ministry of Health's behavioural change communication program, the Infant and Young Child Feeding messages from Alive and Thrive and USAID, the Nutrition Blended Learning Module for the Health Extension Programme by the Ministry of Health, Nutrition Sensitive Agriculture Social Behaviour Change Implementation Guidelines from the Ministry of Agriculture, and the Food Recipe Compendium, also from the Ministry of Agriculture. While some existing materials provide valuable background information and general nutrition knowledge, they often lack specific dietary recommendations for the broader population above 2 years old.

This review underscores the potential role of well-designed, theory-based nutrition behaviour change communication may play in improving dietary intake. Critical take-home messages include raising awareness of certain foods alone may not significantly impact consumption, especially where knowledge is not the key limiting factor. This is supported by evidence of the effectiveness of SBCC programs in other contexts, which are more effective if they include an element to increase access to nutritious foods. RAISE-FS should ensure that the nutrition behaviour change programming is based on an existing theory of behaviour change, includes multiple communication channels that the messages are targeted to address specific challenges in certain regions or by certain population groups, and that social elements influencing food choice behaviour are also considered.

There is a need for more focused dietary advice aligned with the Food-Based Dietary Guidelines. Among the existing materials, certain documents show promise for promoting nutrition activities. however, they often lack specific dietary recommendations for the broader population. Additionally, while existing materials may provide useful guidance, especially in terms of recipes or background information, they need to be adapted to suit the context, social norms, dietary practices, and the specific challenges people face in accessing healthy diets.

1. Introduction

In Ethiopia, only 14% of children under 5 meet the minimum recommended intake of four food groups (Melaku et al. 2016). Inadequate intake of essential nutrients and low consumption of fruits, vegetables, and animal-source foods contribute to poor nutrition outcomes (Arimond and Ruel 2004). Unhealthy diets are significant contributors to non-communicable diseases and mortality (Bekele et al. 2023). It is estimated that Ethiopia loses 16% of its gross domestic product each year due to poor nutrition (EPHI 2013). Nutrition behavioural change communication aims to change social norms and support people to consume healthy diets with an overall aim of improving the health and nutrition status of the population.

There is a small but positive relationship between higher nutrition knowledge and improved dietary intake, specifically regarding increased fruit and vegetable consumption (Spronk et al. 2014). Several studies have explored different aspects of nutrition behavioural change communication, including interventions for school children, adults, and mothers (Murimi et al. 2018). The effectiveness of nutrition behavioural change communication programs can vary based on factors such as program structure, target population, and duration (Alghamdi et al. 2023). An Ethiopian study also showed that nutrition knowledge was positively associated with more diversified diets and healthy eating attitudes and practices (Melesse and van den Berg 2021). This review will specifically consider approaches to promote healthy diets and improve consumption practices among a wider range of individuals, moving away from the focus on women of reproductive age, infants and young children.

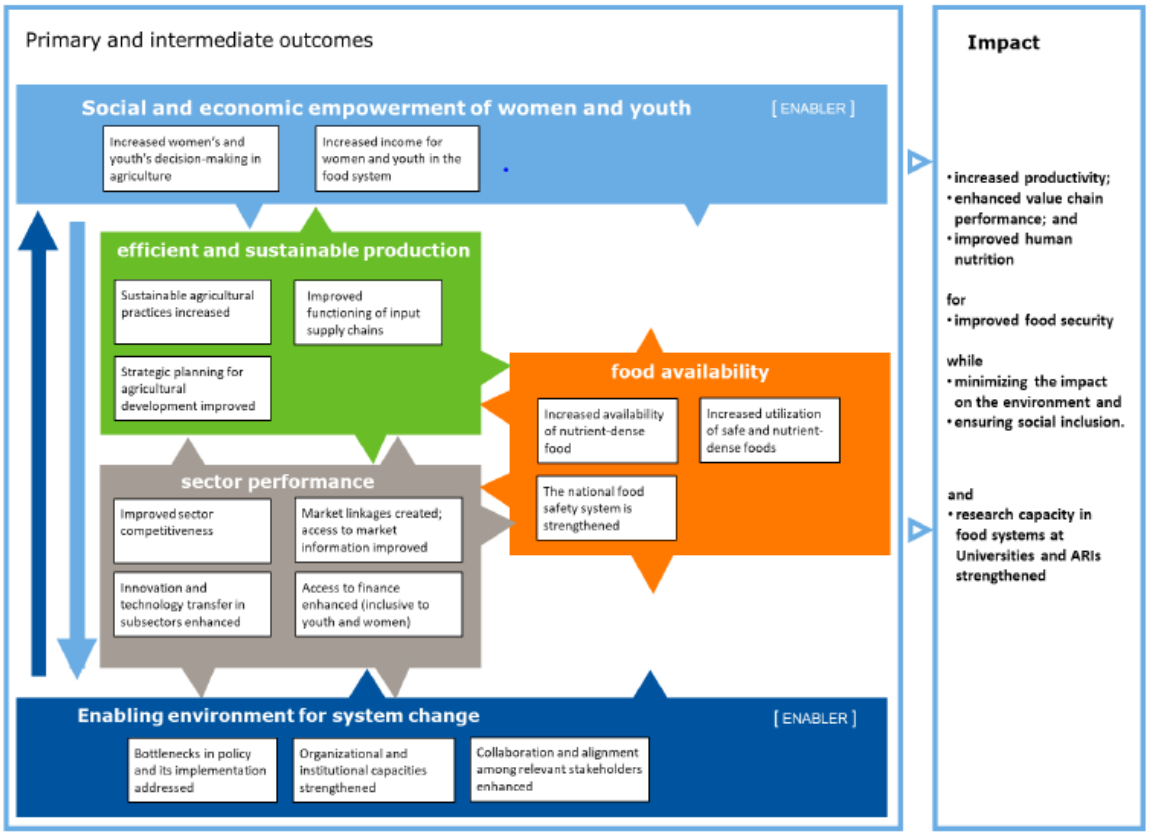
1.1. Introduction to the RAISE-FS Project

The Resilient Agriculture for Inclusive and Sustainable Ethiopian Food Systems program (RAISE-FS) is a four-year initiative aimed at transforming the food system in Ethiopia. By adopting a food systems approach, RAISE-FS seeks to analyse the drivers and activities within the food system to address key leverage points for food system transformation. The program envisions resilient, inclusive, and sustainable food systems that can withstand shocks, support marginalized groups, and operate in an environmentally friendly manner. RAISE-FS focuses on three types of food systems in Ethiopia and aims to generate evidence on how rural households can improve their livelihoods within these systems. The program has five specific outcomes related to social and economic empowerment, sustainable production, enhanced value chains, increased availability of safe and nutritious foods, and an improved enabling environment. Figure 1 describes the theory of change for the project. This review will focus on achieving the outcome of "increased utilisation of safe and nutrient dense foods".

RAISE-FS works in four regions of Ethiopia: Amhara, Oromia, SNNPR, and Tigray. However, due to conflict, work in Tigray was started later so this report only includes data from Amhara, Oromia, and SNNPR. It targets about 27 *woreda*s and addresses the key systemic food systems bottlenecks in a demand-driven manner. Each region has a specific focus based on the current food system, agro-ecology and interests of the partners:

Food System	Amhara	Oromia	South
Commercial orientation	Oilseeds	Spices & herbs	Poultry
High potential, moderately food secure	Potato, teff	Potato, poultry	Potato, pulses
Low potential, food insecure	Food security crops	Food security crops	Food security crops

Figure 1 Theory of Change for the RAISE-FS Food Systems Approach



In this report, RAISE-FS is used as an example of how the key principles of SBCC can be applied to a nutrition sensitive agricultural, project. The aim is not to present a fully developed SBCC strategy for RAISE-FS, which is documented elsewhere, but rather to show the thought process which goes into developing such a strategy, which can hopefully be useful to others trying to develop such a strategy themselves.

1.2. The objectives of the scoping review

General and Specific Objectives:

The overall aim of this report is to ensure that the nutrition social behaviour change communication (SBCC) programming delivered through the RAISE-FS project, which will focus on implementation of the Ethiopian Food-Based Dietary Guidelines, is guided by underlying principles of behaviour change.
More specifically, this report aims to:

1. Identify key underlying principles and theories of behavioural change and how they can be used for the development of effective nutrition behaviour change communication.

This will be translated in the RAISE-FS context by:

2. Reviewing and synthesizing quantitative and qualitative baseline data from the RAISE-FS project relevant for informing nutrition related BCC materials, including exploring factors that are most dominant in shaping food choice behaviours in one intervention *woreda*.
3. Bring together findings from the first two objectives, to provide recommendations for how to approach the development of nutrition related SBCC within projects like the RAISE-FS program.

Finally, the report will briefly consider the broader external context by:

4. Evaluating the existing BCC materials, and delivery approaches found in documents endorsed by the various ministries of the Ethiopian government (Agriculture, Health) and selected development partners, in terms of their alignment with the Ethiopian Food Based Dietary Guidelines (EFBDGs) and BCC principles.

2. Methodology of the scoping review

2.1. Identify key principles of behaviour change

A quick literature review was used to identify various approaches for BCC (Behavioural Change Communication) delivery, looking at which factors are commonly seen in effective BCC programming.

2.1.1. Synthesis of qualitative and quantitative baseline data from raise-fs

For the second aim, we analysed the quantitative and qualitative baseline studies from the RAISE-FS project to gain a deeper understanding of existing dietary gaps, as well as to better understand perceptions surrounding a healthy diet, and if those are in line with what is promoted by the Ethiopian food based dietary guidelines.

RAISE-FS Baseline: The study population consists of 926 people. The study took place in Amhara, Oromia, and the Previous SNNPR region. From each region, 3 woredas were sampled and 2 kebeles per selected woreda. A multistage sampling approach was followed to identify sample respondents with probability and non-probability sampling techniques. In the first stage, sample kebeles were selected from the RAISE FS intervention woredas in each region purposively while in the second stage, sample households were selected randomly from the list of households prepared at kebele level (Abate and Schaap 2022).

Dietary intake data: Dietary intake was measured using the Diet Quality Questionnaire (https://www.dietquality.org/countries/eth). This intake data does not capture quantities consumed but asks if people consumed a group of foods in the previous 24 hours, which means it is not possible to fully assess if people adhere to the FBDG. Comparison will be limited to the percentage of the population consuming the food groups mentioned in the FBDG.

Qualitative data: Focus group discussions were used to collect people's perceptions of a healthy meal. Groups were asked to draw what a healthy meal looked like. Focus group discussions were held for men and women separately and the size of the groups was around 6 to 10 people. The findings of the focus groups were validated by key nutrition actors including health sector actors, at the woreda, zone, and regional level (Snel et al. 2022). This was supplemented by a small piece of formative research carried out in one implementation woreda (Boloso Bombe) which provided the opportunity to dive deeper into what influences food behaviour choice in this area. While the data is not representative of the whole project implementation area, it provides an example of an approach to guide BCC development.

Table 1 The 11 key messages from the FBDG

Key messages	
1	Diversify your diet by selecting from at least 4 food groups in every meal and 6 food groups every day
2	Every day, eat 80–120 grams of legumes such as beans, chickpeas, peas or lentils
3	Eat 100–200 grams of various fruits and vegetables of different colours every day, such as bananas, papayas, kale, carrots, and tomatoes
4	Diversify your diet with 10–20 grams of nuts and oilseeds such as groundnuts, and sunflower or sesame seed
5	Add animal-source foods such as eggs and meat (60 grams) and dairy foods (300–400 grams) to your meals every day

6	Drink 8–10 large glasses of clean water daily
7	Be physically active for at least 30 minutes a day
8	Take up to 15–20 grams of fats and oils per day
9	Limit intake of sugar, sweets, and soft drinks to below 30 grams per day
10	Limit salt intake to below 5 grams per day
11	Limit alcoholic drinks – both factory-processed and homemade – to no more than 2 glasses per week

Source: Food-based dietary guidelines - Ethiopia (fao.org)

FBDG messages selection: Not all 11 key messages are evaluated in the baseline study. Messages 6 and 7 do not focus on food (on water intake and physical exercise) and therefore not taken into consideration in this study. The intake of salt and alcohol (messages 10 and 11) were not captured using the selected data collection method and for that reason not evaluated. Current intake data and the beliefs of a healthy diet were evaluated using the remaining 7 messages.

2.1.2. Recommendations for how to approach the development of nutrition-related SBCC within projects like the RAISE-FS program

Based on the outcomes of aims 1 and 2, proposed approaches for behaviour change communication in the RAISE-FS program are suggested. The aim is that these take into account both the underlying theories and principles of behaviour change (aim 1) and are also contextually relevant (aim 2). This approach will be piloted in selected woredas of the RAISE-FS project, and action research will be carried out to assess the impact of the approach on both knowledge, as well as intake, for individuals participating in the intervention. This report will only include the underlying principles, a more detailed overview of the messages, activities, and delivery channels will be published elsewhere.

2.1.3. Reviewing the content of existing nutrition BCC materials in Ethiopia

In the final phase of this scoping review, we evaluated the content of various nutrition behavioural change communication materials currently used in Ethiopia. A total of 24 existing nutrition BCC documents were reviewed including: 4 published by the Ministry of Agriculture, 3 from the Ministry of Health, 15 from the project Alive and Thrive (many are supporting documents including posters and job aids), 1 from UNICEF and 1 from USAID. The key content of these messages is presented, and we reflect the alignment with the 2022 Ethiopian Food-Based Dietary Guidelines (FBDG).

3. Results

3.1. Identify key principles of behaviour change

3.1.1. Underlying theory social and behavioural change communication

Behaviour Change Communication (BCC) is a strategic approach used in public health, development, and social change initiatives to promote positive behaviour change among individuals, communities, and societies. It encompasses a range of communication activities aimed at influencing attitudes, beliefs, and practices to support healthier, safer, and more sustainable behaviours. Interventions aiming to change behaviour frequently focus on informing and educating people. Awareness and knowledge are necessary, but in many situations not sufficient, to bring about desired behaviour change. Factors like cultural practices or high costs are often key barriers that can prevent change. A behaviour change intervention is not about telling people what they should do. It is about motivating, inspiring, and enabling people to change behaviours that benefit their personal health, as well as the overall wellbeing of their families.

The definitions of social behavioural change and behavioural change are used interchangeably. Strictly speaking, there is a difference in scope and focus between behaviour change (BC) and social behaviour change (SBC) approaches. BC approaches primarily focus on individual-level behavioural change, aiming to promote specific behaviours or habits among individuals, such as adopting healthier eating habits. These approaches typically target factors that influence individual behaviour, such as attitudes, beliefs, knowledge, skills, and environmental cues. SBC approaches cover a broader set of strategies aimed at influencing not only individual behaviour but also social norms, community practices, and structural factors that shape behaviour. These approaches have a more holistic view and recognize the interconnectedness of individuals, communities, and societies in driving behavioural change. SBC interventions address, next to individual-level factors, interpersonal relationships, social networks, cultural norms, enabling environments, and other contextual factors that influence behaviour. Examples of SBC interventions include community mobilization campaigns and community-based participatory research. Other terms and phrases that describe similar concepts include health communication, communication for development (C4D), health promotion, and social marketing. In RAISE-FS, we aim for a holistic approach, which is in line with SBC interventions.

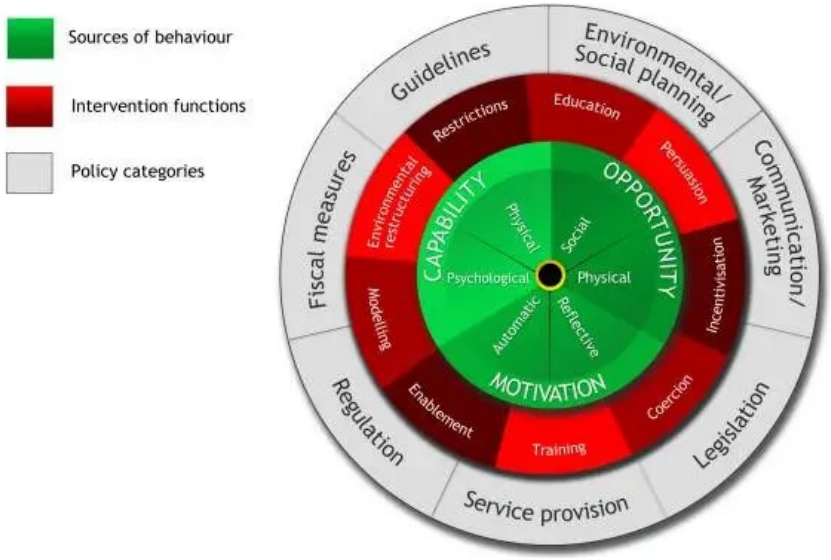


Figure 2 The behavioural change wheel (Story et al. 2008)

Figure 3 COM-B model (Michie, van Stralen, and West 2011)

Over the past decades, various behavioural (change) models have been developed, focusing on different drivers of behaviour. These theories find their roots in various disciplines including health promotion and marketing and are evolving over time. Each of these theories has its strengths and limitations. Some of them focus more on the social environment, like the social-ecological model (Story et al. 2008). Other models focus more on the individual, like the COM-B model (Michie, van Stralen, and West 2011). In addition, a distinction can be made between models that focus on conscious behavioural processes and models that focus on unconscious processes. Which model is most helpful depends on the context and the specific aim or research question. In summary, most models conclude that our behaviour is determined by a combination of internal factors (e.g. motivation), external factors (e.g. social norms), and the capacity (e.g. resources) to conduct the behaviour.

In the socioecological model of behavioural change, social norms play a crucial role in influencing individual behaviours. Social norms are the unwritten rules or standards of behaviour that are considered acceptable within a particular social group or community (Wazir 2023). These norms can shape attitudes, beliefs, and perceptions, ultimately influencing the choices individuals make regarding their behaviours. By identifying and targeting influential social norms, interventions can work towards shifting societal perceptions and promoting healthier behaviours at both the individual and community levels. Strategies may include social marketing campaigns, community mobilization efforts, and fostering supportive social networks that promote positive behaviours and norms.

3.1.2. Developing effective BCC material

Behaviour change interventions can significantly enhance the adoption of the newly developed food-based dietary guidelines. To design effective behaviour, change interventions, it's crucial to ensure they are contextualized and evidence based. This is especially relevant for Ethiopia where large regional differences exist. Tailoring interventions to local needs, climate variations, and cultural habits is essential for their success. Various resources have been developed to support organizations in designing effective BCC interventions, such as the BCC toolkit developed by Nutrition International (Barnett et al. 2022; International 2019). In general, these approaches include the steps visualized in figure 4.

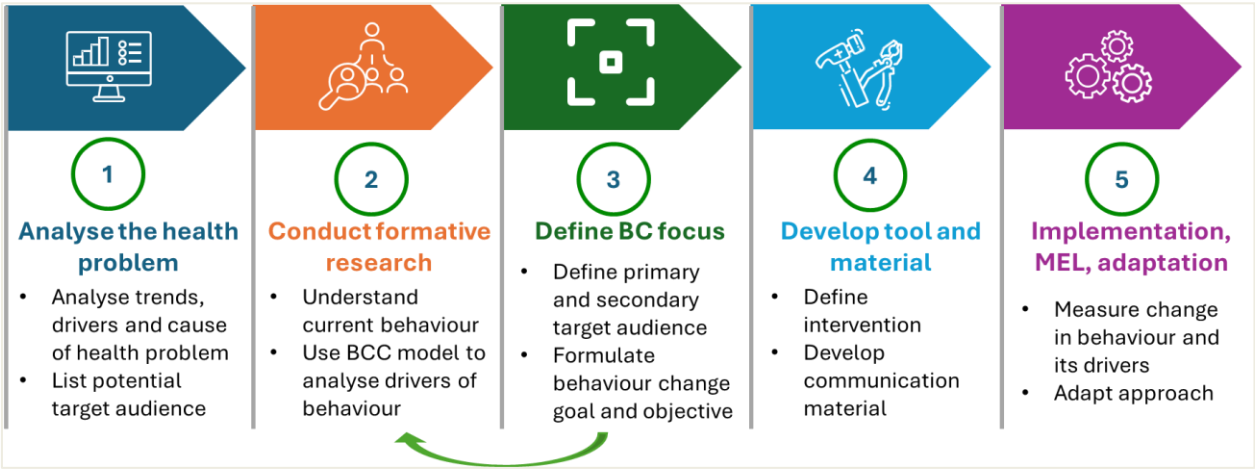


Figure 4 BCC frameworks (International 2019)

The initial step in developing a behaviour change intervention is gaining a thorough understanding of the health issue at hand. When designing an intervention to promote the adoption of FBDGs, it's essential to examine the current dietary patterns. This analysis can pinpoint areas where the gap between current and recommended intake is most significant. Another useful approach is to start with a specific health concern, such as anemia, and explore which food groups may be relevant to address. Sources like research papers, national or regional statistics, reports, and program evaluations can provide useful insights into the potential causes of the health concern and the socio-demographic groups that are most affected. This forms the foundation for identifying potential target populations for the intervention. A clearly defined target group is crucial to ensure that the intervention can be tailored to their specific context and needs. It might be helpful to make segments on socio-demographic factors like age, sex, education, religion, geographic characteristics, or on lifestyle factors like attitude, values, interests, and motivations.

When selecting general information during the first phase, specific information on the needs of the potential target groups in the context of the intervention area may be lacking. Subsequently, in the second phase, formative research is conducted to get a better understanding of the current behaviour of potential target audiences. Formative research is the process of gathering critical insights from target communities and institutions to better understand current behaviours, perceptions, and contextual factors, thus informing the design and development of interventions. In this step, it might be helpful to use a BCC model to support a systematic analysis of the current behaviour and its drivers. The socio-ecological model explained in the previous section can help to define the different levels at which the behaviour is affected. Through qualitative methods such as focus groups or in-depth interviews, drivers related to the individual or environment, such as motivation, beliefs, and perceived barriers, can be assessed. These findings can be supplemented by research on available resources and the environment, such as market analyses to identify locally available products and their affordability. The outcomes of your research efforts can be complemented by additional literature and quantitative data.

In step 3, the final set of desired behaviours is defined, along with the target population. The primary target audiences comprise individuals directly affected by the health problem and are the actors to conduct the behaviour. Additionally, focusing on secondary target behaviours within an intervention can be beneficial, involving individuals who influence the behaviour of the primary target group, such as those who control access to necessary resources or possess high credibility in their environment, like mothers controlling access to specific foods for young girls, or religious leaders. For further defining the behaviour change (BC) strategy, it is helpful to start with a broad BC goal, describing the long-term effect that the intervention aims to achieve. It is essential to focus on actual behaviour rather than aiming for a change in a specific driver like knowledge, as behaviour is often influenced by multiple factors (so change will only happen if all relevant barriers are addressed). Behavioural change goals are then divided into specific objectives, which can focus

on the actual behaviour itself or on its drivers or barriers. When these objectives are formulated using the SMART (Specific, Measurable, Achievable, Relevant, Time-specific) method, it becomes easier to monitor and evaluate progress and impact. An example of a behaviour change goal, and related objectives can be found in Table 2. If new information gaps are identified during the process of defining the behavioural change goal, objectives, and target audience, it may be necessary to return to step 2, as indicated by the black arrow in figure 4.

Table 2 Illustration of a defined behaviour change goal and its objectives

Behaviour change goal	Objectives	Aim
Women of reproductive age in rural areas in Amhara increase their consumption of animal-based products according to the FBDGs	80% of WRA in focus villages will consume daily at least one portion of dairy foods (300-400 grams) after year 2.	Target actual behaviour
	75% of secondary schools in the region that have adopted nutrition education in their curriculum to 80% after year 1.	Target the barrier of lack of knowledge and the driver of attitude
	After 1 year, 100 households have started holding poultry.	Target the barrier of availability

Step 4 is dedicated to crafting the intervention itself. Achieving increased adoption of the desired behaviour relies on altering the balance between barriers (e.g. prices, lack of knowledge or skills) and facilitators (e.g. health awareness). For selecting which methods or activities can be deployed to drive behaviour change, inspiration can be found in social market theories (Hastings, Angus, and Bryant 2011). According to this theory, the most effective manner to enable behaviour change is by leveraging a mix of different activities targeting the so-called 4Ps (Smith & Strand). The "product" refers to the behaviour itself, considering any tangible objects that may support it, such as selling nutritious foods in small packages to ensure affordability for lower-income consumers. "Price" encompasses the costs associated with practicing the desired behaviour, which can include monetary expenditures (for ingredients, fuel, etc.), but also aspects like time or effort (for growing, cooking etc) and comfort (energy needed to learn new recipes). It is essential that the benefits outweigh the costs to ensure the adoption of the desired behaviour. “Place” refers to where the consumer performs or considers the desired behaviour. Activities addressing this aspect involve ensuring these locations are accessible and equipped with the necessary resources to facilitate the behaviour. The last P pertains “Promotion”, ensuring that the target audience is aware of and understand the desired behaviours and their associated benefits. An essential element of promotion involves developing an effective behavioural communication strategy.

When defining communication channels, it's essential to consider the target audience profile, their media habits, preferred sources for health advice, and important figures within their community. These factors help tailor communication strategies effectively. Communication channels can generally be categorized into three groups. Mass media channels include television, radio, billboards, websites, and social media. They have a broad reach but may be less effective as they are not tailored to the specific needs of different population segments. Community-based channels encompass local radio, announcements using megaphones, wall paintings, community meetings, and market demonstrations. These channels offer the opportunity to deliver contextualized messages tailored to the needs, perceptions, and cultural habits of the local population. Interpersonal channels provide the deepest level of engagement. In interpersonal communication, the sender plays a crucial role, and the effectiveness of the messages relies on the sender's perceived credibility. Examples of activities or instruments under interpersonal channels include counselling, online platforms, targeted mobile phone messaging, interactions with health providers, workshops, and discussions.

3.1.3. Effects of bcc interventions globally

What effects can BCC interventions have on people’s dietary practices? Nutrition behaviour change communication programs have been shown to be effective in improving eating patterns and supporting people to consume more healthy diets, especially when using multiple intervention strategies.

A meta-analysis of nutrition-sensitive agricultural interventions, most of which included nutrition advice, found a significant positive impact on the diet diversity scores of children aged 6 months to 5 years (Margolies et al. 2022). A large majority of the studies on nutrition behaviour change communication have focused on infant and young child feeding (IYCF), especially in African contexts, given the critical role that this period of rapid growth plays in shaping an individual's physical and mental development. It should be noted that nutrition-sensitive agricultural interventions also support increased production of nutrient-dense foods. It may be hard to separate the effect of the messaging alone, in the absence of support to increase access to certain foods, suggesting that increasing access to nutritious foods is also important. The effect of behaviour change interventions on micronutrient intake specifically is mixed. Studies in Peru and Malawi found that zinc and iron intake improved in children of caregivers who received behavioural change communication or counselling (Penny et al. 2005; Hotz and Gibson 2005), while studies in Brazil and Bangladesh reported no evidence of change (Santos et al. 2001; Bortolini and Vitolo 2012; Brown et al. 1992). Studies in Bangladesh and Malawi looking at vitamin A intake found no evidence of increased intake (Hotz and Gibson 2005; Brown et al. 1992).

3.1.4. Summary of the effectiveness of social and behaviour change communications in Ethiopia

Although there has been an increase in the supply of energy and protein in Ethiopia since the early 1990s, including increased availability of micronutrients, the food supply is still unable to meet the population's requirement for key nutrients such as calcium, vitamin A, folate, and other B-vitamins (Sheehy et al. 2019). The Ethiopian diet remains high in complex carbohydrates (primarily sourced from cereals, roots, and tubers), and deficient in fat, and protein (Sheehy et al. 2019). Similar to the global context, BCC interventions in the Ethiopian context were much more likely to be successful if they also increased access to nutrient-dense foods (Ramakrishnan and Girard 2020). The RAISE-FS project has been mainstreaming nutrition literacy all agriculture and business-related pilots as well as piloting innovative nutrition sensitive agriculture mechanism through different pathways to enhance access and utilization of nutrient dense foods. The EFBDGs, which guide the BCC nutrition activities in the RAISE-FS project, aim to reach the whole population. There is limited data on the overall effectiveness of nutrition BCC in the Ethiopian context (Gebru et al. 2018). However, key principles which have shown to be effective for infant and young child feeding (S)BCC interventions may also be relevant for other groups. These include interventions that are interactive, contextual, theory-based, and use multiple channels of communication, segment the message by audience, have multiple contact points, and are multisectoral. Those which target social norms (SBCC interventions) have been shown to be more effective than traditional nutritional change behavioural change communication (BCC) interventions that only focus on individual behaviour.

Other considerations also need to be considered when integrating nutrition within agricultural programs such as RAISE-FS. These include those related to personnel including inadequate training and limited mobility, those related to implementing organizations including ambiguous organizational directives, leading to specific challenges integrating agriculture and nutrition sectors, and those related to social factors including insufficient involvement of women (Fanzo et al. 2015).

In summary, following recommendations for formulating BCC messages, based on the findings of this review include:

1. Reinforcing messages by using multiple communication channels.
2. Messages should target both individual as well as social factors (SBCC).
3. SBCC Interventions should be coupled with support to improve the availability, accessibility, and affordability of food.
4. SBCC interventions should be coupled with action research to facilitate the uptake of research findings and evidence-based practices into routine practice and to improve the quality and effectiveness of nutrition BCC.

3.2. Formative research from RAISE-FS results of the baseline and rapid food system appraisal

As described in steps 1 and 2 of the approach to developing a BCC approach, first the dietary gaps need to be clear. Table 3 below presents the qualitative data from the baseline, which highlights specific dietary gaps, as well as data around perceptions people have about healthy diets (Julia Glaser 2024).

Table 3 Estimation of the effects of nutrition education on behaviour using the results from the FGD that asked for the perceptions of a healthy meal, combined with the current dietary intake data.

FBDG[1]:	Dietary intake data (from DQQ[2]) *	Perceptions of a healthy meal**
Diversify your diet, with at least 4 food groups in every meal and 6 food groups every day	Amhara: Average DDS[3] is 2.4 and this was the same for men and women of reproductive age.	Amhara: Between 3 and 5 food groups were mentioned by the focus groups. Most (4 out of 6) described meals contained 4 or more food groups. 3 focus groups mentioned diversity and eating different kind of foods as an important part of a healthy diet. Other focus groups said switching to eating different types of grains was good because that was perceived as healthier (*teff* was cited as better than maize).
	Oromia: Average DDS[3] was 3.2. The score was 3.3 for men and 3.1 for women of reproductive age.	Oromia: Almost all focus groups mentioned 4 or 5 food groups in a meal. All groups mentioned cereal, vegetables and animal-sourced foods. Some groups added lentils and/or butter as a 4th and/or 5th food group. Eating different types of food was mentioned by all but 1 focus group as an important part of a healthy diet.
	Previous SNNPR: Average DDS[3] was 3.1. The score was 3.0 for women of reproductive age and 3.2 for men.	Previous SNNPR: Between 2 and 5 food groups were mentioned in the description of a healthy meal. Only 2 focus groups mentioned 4 or more food groups in a healthy meal. All focus groups mentioned cereals. Eating a diverse diet was not mentioned by any of the focus groups as an important part of a healthy diet.
80–120 grams of legumes	Amhara: Legumes were consumed by 96% (by 98% of all men and by 93% of women)	Amhara: All focus groups identified legumes as part of a healthy diet. *Shiro* and *kik* were mostly mentioned as healthy dishes.
	Oromia: Legumes were consumed by 88% (by 89% of all men and 87% of all women)	Oromia: 3 out of 6 focus groups mentioned legumes as an important part of a healthy diet. *Shiro*, chickpea and faba bean were mentioned as examples.
	Previous SNNPR: Legumes are consumed by 44% (43% of all men and 44% of all women)	Previous SNNPR: Legumes were mentioned by 4 out of the 6 focus groups as part of a healthy diet. *Wot*, *nefro*, *kike* and haricot beans were mentioned examples. All women groups and only one men group mentioned pulses as an important part of a healthy diet.
100–200 grams of various fruits and vegetables of different colours	Amhara: consumption of any fruit or veg: 30%. DGLV: 21%. Other vegetables: 15%. Vit A rich fruit/veg: 2%; and Other fruit: 1%	Amhara: 4 focus groups mentioned vegetables as part of a healthy diet. Examples mentioned were cabbage, okra, cucumber, mulukiya or kudra. Potato was also considered a vegetable by quite some focus groups. Fruits were mentioned by 2 focus groups whose participants were women
	Oromia: Consumption of any fruit or veg: 61% DGLV: 17% Other vegetables: 53% Vit A rich fruit/veg: 8% Other fruit: 9%	Oromia: Vegetables were mentioned by all focus groups as an important part of a healthy diet. Examples mentioned are beet root, cabbage, carrot, potato, tomato, sweet potato. Fruits were mentioned by only 2 focus groups in Babile *woreda* as part of a healthy diet.

	Previous SNNPR consumption of any fruit or veg: 81% DGLV: 71% Other vegetables: 44% Vit A rich fruit/veg: 10% Other fruit: 9%	Previous SNNPR Vegetables, as part of a healthy dish, were mentioned by three focus groups. Mostly Kale was mentioned. Fruit was mentioned by 1 women's focus group. They mentioned avocado, banana or mango.
10–20 grams of nuts and oilseeds	Amhara: consumed by 1%. Oromia: consumed by 13% (by 16% of all men and by 9% of all women) Previous SNNPR consumed by less than 1%.	None of the focus groups in all regions mentioned nuts or oil seeds.
animal-sourced foods such as eggs and meat (60 grams) and dairy foods (300–400 grams)	Amhara: Dairy was consumed by 2%; meat, poultry and fish by 0%, and eggs by 0% of the population. Oromia: Dairy is consumed by 23% (25% of men and 22% of women). Meat, poultry and fish by 6% and eggs by 7% of the population. Previous SNNPR: Dairy is consumed by 28% (29% of all men and 26% of all women). Meat, poultry and fish by 3% and eggs by 4% of the population.	Amhara: Eggs, meat and dairy were mentioned by all groups while fish was mentioned by only one group. Oromia: Animal sourced foods were mentioned by all groups. All mentioned, milk and meat as components of a healthy diet. Eggs were mentioned by only one male focus group. Previous SNNPR: Animal-sourced foods were mentioned by 4 out of 6 focus groups as components of a healthy diet. While 4 groups mentioned dairy, 3 groups mentioned meat and eggs.
15–20 grams of fats and oils per day	Not included in DQQ	Amhara: In total, 3 out of 6 focus groups mentioned fats. All 3 mentioned butter and 2 also mentioned oils. Two male and 1 female focus groups mentioned fats Oromia: Butter was mentioned as a component of a healthy diet by 4 out of 6 focus groups. All male groups made mention of butter while only one female group did. Previous SNNPR: Butter was mentioned as a component of a healthy diet by 2 out of 6 focus groups (men and women groups).
Limit intake of sugar, sweets and soft drinks to below 30 grams per day	Amhara: 41% of the population consumed sugary products. Oromia: 75% of the population consumed sugary products. Previous SNNPR 30% of the population consumed sugary products.	Amhara: 2 out or 6 focus groups (men and women) mentioned honey as a part of a healthy meal. Oromia: 2 out or 6 focus groups (men and women) mentioned honey as a part of a healthy meal. Previous SNNPR 3 out of 6 focus groups mentioned coffee as part of a healthy meal (coffee was consumed almost always with sugar).

** Dietary intake data asks for the % of people consuming a specific food group and does not take into account the amount that is consumed.*
*** Focus groups with men and women were asked to draw their ideal healthy meals. It was analysed how the dishes included the food groups mentioned by the FBDG. The focus groups were asked to draw one meal and not specifically the total consumption during the day. So, this exercise cannot give a conclusion on the amounts consumed and if and how they are in line with the guidelines.*

[1]Food-based dietary guidelines
[2]Diet Quality Questionnaire
[3]Dietary diversity score

3.3. Recommendations and suggestions for SBCC approaches for the raise-fs project

In this section we consider the underlying theory of behaviour change and the key findings from the formative research to develop a set of key principles that should be considered when developing an SBCC approach for a project like RAISE-FS. While we have applied these findings to the RAISE-FS project, our intention is that they are also useful for other projects that wish to start a BCC intervention, especially one that is linked to an agricultural intervention.

Key finding	Recommendation for programming/ RAISE-FS
Address social norms it is important to address the overall social norms, in addition to simply delivering a message about changing behaviours. Gender norms and relationships are one such norm, as these have a strong influence on many elements of food choice behaviour. Other social norms might include specific food taboos, or perceptions of certain foods, for example the perception that vegetables are a poor person's food.	Addressing social norms, especially around women's roles in making decisions, both in terms of what the household produces, as well as what various individuals in the household consume, is important to support increased consumption of nutritious foods for the entire household. The RAISE-FS project uses the Social Analysis and Action methodology, developed by the NGO CARE, as a starting point for nutrition BCC activities (Mekuria, Sprinkel, and Cowan 2018). This is one methodology to support gender transformative approaches at the community level, however, there are other methodologies for gender transformative approaches that may also be useful to consider.
Formative research is key and should be carried out to inform the design of nutrition messages, and the activities to support specifically ensuring that they are targeted effectively for the specific community they are trying to reach (contextualization) and for specific individuals within that community (segmentation).	In RAISE-FS, the quantitative baseline and qualitative rapid food system assessment provide useful data to inform the SBCC messages. In the design of the nutrition messaging, we have specifically questioned the assumption that people do not know about a healthy diet and have tried to design messages to help people find answers, collectively and with support from other community members, in order to improve their diets. Due to the high regional variation in terms of currently consumed diets, as well as people's perceptions of a healthy diet, regional staff need to make sure that the messages are well tailored for their region and reflect the diets and challenges people in that region face.
Specific, targeted messages for specific groups messages should be developed for both primary target group (those who you want to actually change their behaviour) and secondary target group (people who influence the behaviour of the primary target	In RAISE-FS we will target the entire household, not only women, who are most often the target of nutrition education. This provides an opportunity for others, including men to learn about nutrition, for themselves and their family. Since the goal of the EFBDGs is really to change the dietary practices of the whole population, we hope that we can change the perceptions of the entire community about the importance of nutrition.

groups). These messages should include concrete behaviours to be changed.	
SBCC nutrition messages are much more likely to be taken up if they include support to increase access, availability, or affordability to nutrient dense foods.	In the context of rural Ethiopia, one of the main reasons for low dietary diversity is access, in terms of both availability (linked in part to seasonality due to the high reliance on rain fed agriculture) as well as affordability of nutritious foods. In the RAISE-FS project, households who are being supported by home garden initiatives will be the key entry point for the project.
SBCC interventions should be based on underlying principles of behaviour change.	The RAISE-FS project is employing the capacities, opportunities and motivation (COM-B) model for behaviour change. For example, while most people know about the importance of dietary diversity, and consuming food from many food groups, levels of dietary diversity remain very low. Instead of only telling people to consume more diverse diets, consider their capacities (do they know what a diverse diet looks like, are they able to cook these foods? Can they afford these foods?), opportunities (do they have the time to prepare such food? Who makes decisions around what food is prepared? Who decides who eats what?). Finally, what motivations do people have to consume more diverse diets? (What benefits do they hope to have?) Figuring out which of these is most limiting for people and supporting the identification of specific strategies to tackle the most limiting capacities, opportunities, and motivations is more likely to lead to real changes in consumption practices.
Reinforcing messages by using multiple communication channels.	The RAISE-FS project will engage with community members at least 6 times in a year, aiming to create an integrated program, which is also linked to gender norms in the community. Each engagement moment will include interactive activities and support collective discussion and problems solving from the community.

3.4. Reviewing the content of existing nutrition BCC materials implemented in Ethiopia

Nutrition behaviour change communication is not new in the Ethiopian context. Many programs and projects have been implementing nutrition behaviour change communication activities for many years. Many large-scale USAID projects active in Ethiopia have implemented awareness-raising activities around nutrition in their programs since 2003, and awareness raising activities are one of the most common nutrition interventions funded by development partners (Kennedy et al. 2020). Given the long history of programs supporting nutrition behaviour change, numerous guiding documents have also been developed. Table 4 includes 24 existing documents developed by various ministries of the Ethiopian government, or other development partners. These have been reviewed in terms of 1) their alignment with the EFBDGs and 2) if and how they might be useful to support nutrition behaviour change communication in the RAISE-FS project.

Based on the available documents, several resources stand out as particularly relevant for RAISE-FS. These include the Food Recipe Compendium from the Ministry of Agriculture (August 2021), offering a collection of recipes adaptable to align with dietary guidelines and suitable for differing regional diets. Additionally, the Proper Nutrition for Adolescents HEW's Reference Guide and various visual materials including posters on healthy snacks, breakfast, and diet diversity offer clear messaging on healthy eating habits, particularly beneficial for adolescents, women and children. While these materials may not directly target RAISE-FS's demographic, their principles could be adapted to promote better dietary practices within rural communities. Furthermore, the USAID Nutrition Education Training for Agriculture Extension Officers and Alive and Thrive, although primarily focused on infants and young children, provides valuable insights into integrating nutrition education with agricultural activities, which could inform the development of nutrition education components within the RAISE-FS program. Incorporating elements from these resources in the BCC can enhance RAISE-FS's ability to address dietary needs and promote healthier eating habits among rural households effectively. Details of the content analysis of nutrition behavioural change communication materials available in Ethiopia found in the Annex.

4. Conclusion and recommendations

This review considers the potential role of behaviour change communication including key principles for most effective messaging and campaigns, how to design a nutrition behaviour change communication programmes, how RAISE-FS incorporated key SBCC principles in designing campaigns and, finally which of the existing materials might be useful in operationalizing the Ethiopian Food-Based Dietary Guidelines.

1) Identify key principles of behaviour change

Based on the literature, key best practices for effective behaviour change communication include: reinforcing messages by using multiple communication channels; targeting both individual as well as social factors coupling SBCC interventions with support to improve the availability, accessibility, and affordability of food and the use of action research to facilitate uptake of research findings and evidence-based practices into routine practice and to improve the quality and effectiveness of nutrition BCC.

2) synthesis of qualitative and quantitative baseline data from RAISE-FS

The baseline RAISE-FS study offered an overview of current dietary patterns in relation to the key messages of Food-Based Dietary Guidelines (FBDG). While the dietary intake data lacks specific consumption amounts, it explores the alignment of people's ideal meals with FBDG key messages. It suggests that raising awareness of certain foods alone may not significantly impact on consumption, as people are aware that these foods are healthy but still do not consume them. SBCC messaging should focus on how people can overcome specific challenges related to food availability, affordability, and accessibility.

3) Recommendations for how to approach the development of nutrition related SBCC within projects like the RAISE-FS program

The RAISE-FS program will seek to address social norms, especially around women's roles in making decisions, in terms of what the household produces, as well as what various individuals in the household consume, using a gender transformative methodology. The quantitative baseline and qualitative rapid food system assessment are used to inform the SBCC messages, and we seek to address not only knowledge, but also other barriers people face in accessing healthy diets. The EFBDGs are unique in the Ethiopian context as they move beyond the traditional target group of women and young children and promote nutrition for the whole population. This provides an opportunity for others, including men to learn about nutrition, for themselves and their families. The project will also provide support for home garden production to increase households' ability to access nutrient-dense crops. The RAISE-FS project employs the capacities, opportunities, and motivation (COM-B) model for behaviour change. By being specific about which model we are using the project is able to identify specific strategies to tackle the most limiting capacities, opportunities, and motivations. Finally, the RAISE-FS project will engage with community members at least 6 times in a year. Each engagement moment will include interactive activities and support collective discussion and problems solving with the community.

4) Reviewing the content of existing nutrition BCC materials in Ethiopia

The evaluation of BCC materials from Ethiopia demonstrates a need for more focused dietary advice aligned with the Food-Based Dietary Guidelines. While some existing materials provide valuable background information and general nutrition knowledge, they often lack specific dietary recommendations for the broader population above 2 years old.

Reference

Abate, L., & Schaap, M. (2022). *Resilient agriculture for inclusive and sustainable Ethiopian food systems: Baseline report 2022*. Stichting Wageningen Research Ethiopia.

Alghamdi, M. M., Burrows, T., Barclay, B., Baines, S., & Chojenta, C. (2023). Culinary nutrition education programs in community-dwelling older adults: A scoping review. *The Journal of Nutrition, Health & Aging, 27*(1), 142–158.

Arimond, M., & Ruel, M. T. (2004). Dietary diversity is associated with child nutritional status: Evidence from 11 demographic and health surveys. *The Journal of Nutrition, 134*(10), 2579–2585.

Barnett, I., Meeker, J., Roelen, K., & Nisbett, N. (2022). Behaviour change communication for child feeding in social assistance: A scoping review and expert consultation. *Maternal & Child Nutrition, 18*, e13361.

Bekele, T. H., Trijsburg, L., Brouwer, I. D., de Vries, J. H. M., Covic, N., Kennedy, G., Alemayehu, D., & Feskens, E. J. M. (2023). Dietary recommendations for Ethiopians based on priority diet-related diseases and causes of death in Ethiopia: An umbrella review. *Advances in Nutrition*. https://doi.org/10.1093/advances/nmad045

Bortolini, G. A., & Vitolo, M. R. (2012). The impact of systematic dietary counseling during the first year of life on prevalence rates of anemia and iron deficiency at 12–16 months. *Jornal de Pediatria, 88*(1), 33–39.

Brown, L. V., Zeitlin, M. F., Peterson, K. E., Chowdhury, A. M., Rogers, B. L., Weld, L. H., & Gershoff, S. N. (1992). Evaluation of the impact of weaning food messages on infant feeding practices and child growth in rural Bangladesh. *The American Journal of Clinical Nutrition, 56*(6), 994–1003.

Ethiopian Public Health Institute (EPHI). (2013). *The cost of hunger in Ethiopia: Implications for the growth and transformation of Ethiopia*. Addis Ababa, Ethiopia.

Fanzo, J., Marshall, Q., Dobermann, D., Wong, J., Merchan, R. I., Jaber, M. I., Souza, A., Verjee, N., & Davis, K. (2015). Integration of nutrition into extension and advisory services: A synthesis of experiences, lessons, and recommendations. *Food and Nutrition Bulletin, 36*(2), 120–137.

Gebru, M., Remans, R., Brouwer, I. D., Baye, K., Melesse, M. B., Covic, N., Habtamu, F., Abay, A. H., Hailu, T., & Hirvonen, K. (2018). *Food systems for healthier diets in Ethiopia: Toward a research agenda*. IFPRI Discussion Paper.

Hastings, G., Angus, K., & Bryant, C. (2011). *The SAGE handbook of social marketing*. London: SAGE Publications.

Hotz, C., & Gibson, R. S. (2005). Participatory nutrition education and adoption of new feeding practices are associated with improved adequacy of complementary diets among rural Malawian children: A pilot study. *European Journal of Clinical Nutrition, 59*(2), 226–237.

Nutrition International. (2019). *Behaviour change intervention toolkit*.

Glaser, J., Alemayehu, G., Pittore, K., & Abate, L. (2024). *Are the Ethiopian dietary guidelines in line with what people believe to be a healthy diet and what they consume?* Addis Ababa, Ethiopia.

Kennedy, E., Mersha, G. A., Biadgilign, S., Tessema, M., Zerfu, D., Gizaw, R., & Kershaw, M. (2020). Nutrition policy and governance in Ethiopia: What difference does 5 years make? *Food and Nutrition Bulletin, 41*(4), 494–502.

Margolies, A., Kemp, C. G., Choo, E. M., Levin, C., Olney, D., Kumar, N., Go, A., Alderman, H., & Gelli, A. (2022). Nutrition-sensitive agriculture programs increase dietary diversity in children under 5 years: A review and meta-analysis. *Journal of Global Health, 12*, 04067.

Mekuria, F., Sprinkel, A., & Cowan, E. (2018). *Social analysis and action global implementation manual*. Cooperative for Assistance and Relief Everywhere Inc.

Melaku, Y. A., Misganaw, A., Deribew, A., Tessema, G. A., Deribe, K., Sahle, B. W., Abera, S. F., Bekele, T., Lemma, F., & Amare, A. T. (2016). The impact of dietary risk factors on the burden of non-communicable diseases in Ethiopia: Findings from the Global Burden of Disease study 2013. *International Journal of Behavioral Nutrition and Physical Activity, 13*, 122.

Melesse, M. B., & van den Berg, M. (2021). Consumer nutrition knowledge and dietary behavior in urban Ethiopia: A comprehensive study. *Ecology of Food and Nutrition, 60*(2), 244–256.

Menon, P., Covic, N. M., Harrigan, P. B., Horton, S. E., Kazi, N. M., Lamstein, S., Neufeld, L., Oakley, E., & Pelletier, D. (2014). Strengthening implementation and utilization of nutrition interventions through research: A framework and research agenda. *Annals of the New York Academy of Sciences, 1332*(1), 39–59.

Michie, S., van Stralen, M. M., & West, R. (2011). The behaviour change wheel: A new method for characterising and designing behaviour change interventions. *Implementation Science, 6*, 42.

Murimi, M. W., Moyeda-Carabaza, A. F., Nguyen, B., Saha, S., Amin, R., & Njike, V. (2018). Factors that contribute to effective nutrition education interventions in children: A systematic review. *Nutrition Reviews, 76*(8), 553–580.

Penny, M. E., Creed-Kanashiro, H. M., Robert, R. C., Narro, M. R., Caulfield, L. E., & Black, R. E. (2005). Effectiveness of an educational intervention delivered through the health services to improve nutrition in young children: A cluster-randomised controlled trial. *The Lancet, 365*(9474), 1863–1872.

Ramakrishnan, U., & Webb Girard, A. (2020). Improving children's diet: Approach and progress. *Global Landscape of Nutrition Challenges in Infants and Children, 93*, 25–38.

Santos, I., Victora, C. G., Martines, J., Gonçalves, H., Gigante, D. P., Valle, N. J., & Pelto, G. (2001). Nutrition counseling increases weight gain among Brazilian children. *The Journal of Nutrition, 131*(11), 2866–2873.

Sheehy, T., Carey, E., Sharma, S., & Biadgilign, S. (2019). Trends in energy and nutrient supply in Ethiopia: A perspective from FAO food balance sheets. *Nutrition Journal, 18*, 46.

Snel, H., Glaser, J., Teshome, A., Mekuria, A., Tefera, T., Alamayhu, G., Yohannes, H., Schrader, T., Schaap, M., & Pittore, K. (2022). *Facilitator guide for rapid food system appraisal in RAISE-FS: Manual on rapid food system appraisal*. Stichting Wageningen Research Ethiopia.

Spronk, I., Kullen, C., Burdon, C., & O'Connor, H. (2014). Relationship between nutrition knowledge and dietary intake. *British Journal of Nutrition, 111*(10), 1713–1726.

Story, M., Kaphingst, K. M., Robinson-O'Brien, R., & Glanz, K. (2008). Creating healthy food and eating environments: Policy and environmental approaches. *Annual Review of Public Health, 29*, 253–272.

Wazir, R. (2023). Social norm change, behavioural approaches and the politics of knowledge: A conversation between the ivory tower and the field. *Development and Change, 54*(1), 30–58.

Annex I

Content analysis of nutrition behavioural change communication materials available in Ethiopia

Sectors or organization	Name of the BCC document	Content covered in the BCC	The content missed based on the FBDG	Suggestion for the RAIS-FS/MOA BCC material for the rural HH
Ministry of Agriculture (August 2022)	Nutrition Sensitive Agriculture Social Behaviour Change Implementation Guideline	Describes the basics of Social and Behaviour Change (SBC) - And how it can be applied to Characterise - dietary behaviours and nutrition	Need-based dietary advice is not part of this guideline	Principles may be useful in the translation of dietary advice into specific messages
Ministry of Agriculture (August 2021)	Food Recipe Compendium	Contains a collection of recipes for: quality protein maize, common beans, mung beans, sorghum, fruits and vegetables, orange fleshed sweet potatoes, soybeans and fish, including nutrient calculations. Includes some basic nutrition information including a description of Food and food groups, and the importance of personal and environmental cleanliness	The recipes and advice in this document need adjustment based on food-based dietary guidelines.	This can be used as the basis for recipe demonstration, focusing on those recipes which are regionally relevant (or most lacking in the diet). Could link to specific commodities being promoted
Ministry of Agriculture (NOVEMBER 2021)	SBCC Intervention materials for PSNP Public Work Clients	Focuses on a range of social issues, specifically targeting PSNP clients. Nutrition related topics include gender, Social Development and Nutrition, maternal nutrition, Breastfeeding and Complementary Feeding; Water, Sanitation and Hygiene (WASH), Nutrition-Sensitive Agriculture and Household resource management	This is more for vulnerable populations. Don't consider the general population's dietary advice.	It's important to consider some tips during vulnerable conditions. However, this BCC is targeting households with healthy and normal nutrition status.
Ministry of Agriculture (NOVEMBER 2018)	National Nutrition-Sensitive Agriculture Training Manual for Agricultural Development Agents	Focuses on nutrition sensitive agriculture including the basics of: • human nutrition • Agriculture and nutrition linkage • Crops, animal-source foods and nutrition • Water, sanitation, hygiene and nutrition • Gender and nutrition • Agriculture-nutrition social and behavioural change • Multisectoral coordination for nutrition	It does not provide specific dietary advice rather it provides more general knowledge about nutrition, nutrition-sensitive agriculture, and gender sensitive implementation using a multisectoral approach.	RAISE-FS organized a training in collaboration with the MOA using this training manual so implementing partners already have this background. There is no need to include this in the new BCC.

Ministry of Health (June 2016)	National Guideline on Adolescent, Maternal, Infant, and Young Child Nutrition	Includes nutrition specific advice for adolescence focusing on: - Nutrition for HIV, - Management of Severe Malnutrition - Preventing eating disturbances - Preventing and managing obesity Nutrition assessments and specific advice for pregnant women including during pre-pregnancy, pregnancy and antenatal care Infant and Young child feeding including Breastfeeding; Complementary feeding and Infant and young child feeding in special contexts including HIV/AIDS; in emergency and for low-birth-weight infants.	This also provides a comprehensive nutrition knowledge for the general population. The specific dietary advice based on the energy and nutrient requirements is not reflected especially for the general population above 2 years old.	The target groups are those with specific dietary needs and this advice might be more relevant for health-related interventions than agricultural interventions.
Ministry of Health	Nutrition Blended Learning Module for the Health Extension Programme	Session 1: Food, Diet, and Nutrition: An Overview Session 2: Nutrients and their Sources Session 3 Nutritional Requirements Throughout the Lifecycle Session 4 Infant and Young Child Feeding Session 5 Nutritional Assessment Session 6 Common Nutritional Problems in Ethiopia Session 7 Preventing Micronutrient Problems in Ethiopia Session 8 Household Food Security Session 9 Managing Acute Malnutrition Session 10 Managing Severe Acute Malnutrition Session 11 Nutrition Education and Counselling Session 12 Nutrition and HIV Session 13 Nutrition Information System	The document provides basic nutrition knowledge about nutrition. The specific dietary advice for the general population is not part of this document.	The summary of the basic may be useful for reasoning the importance of dietary advice and need for translation of dietary advice into specific messages.
Ministry of Health (September 2021)	Guideline for Infants and Young Child Feeding in Emergencies (IYCF-E) for Ethiopia	Strategic objective 1: Sensitization and advocacy for enforcement and implementation of relevant policies/guidelines on IYCF-E Strategic Objective 2: Strengthen the technical capacity of the workforce to protect, promote, and support IYCF-E in emergency Strategic objective 3: Protect, promote, and support optimal IYCF-E by delivering integrated health and nutrition services Strategic objective 4: Minimize the risk of artificial feeding among non-breastfed children Strategic objective 5: Recognize and support the special needs of pregnant and lactating women	This document is focused on the population below 2 years old.	Not RAISE-FS focus group. If needed, better to use existing BCC for under two years.

		Strategic objective 6: Coordinate multi-sectoral operations for IYCF-E Strategic objective 7: Social and behavioural change communication for IYCF-E Strategic objective 8: Assess, monitor, and evaluate		
Alive and Thrive	Child Nutrition Card	- Early initiation and exclusive breastfeeding - Initiation of complementary feeding at 6 months - Adding milk and egg to the complementary food - Add vegetables to baby's food - Father's support - Three meals per day - An extra meal every day for 7 days for a sick child		
	Complementary feeding of children 6-24 months old for IYCF trainers and promoters	- Feeding of complementary foods (variety and thickness/consistency) - Frequency and amount of complementary feeding - Active/responsive feeding - Feeding during illness and recovery - Hygiene, safe preparation, and storage of complementary foods - Demonstration on local complementary food preparation - Counseling and reaching an agreement with the mother, caregiver, and family members - Adult learning - Field visit and feedback - Action plan development	This document is focused on the population below 2 years old.	Not RAISE-FS focus group. If needed, better to use existing BCC for under two years.
	Infant & Young Child Feeding Quick Reference Book (0- 24 months)	Why are feeding practices in the first two years of life so important? Section 1 Feeding a child before 6 months: exclusive breastfeeding Section 2 How to feed a child after 6 months: complementary feeding Section 3 Feeding practices in special situations Section 4 Promotion of optimal infant and young child feeding practices	This document is focused on the population below 2 years old.	Not RAISE-FS focus group. If needed, better to use existing BCC for under two years.
	Launching Community Activities to Promote 7 Feeding Actions	Building Smart and Strong Families to Implement Child Nutrition Card	This document is focused on the population below 2 years old.	Not RAISE-FS focus group. If needed, better to use existing BCC for under two years.

Father card	Father for your child to be healthy, smart, and strong, carry out your responsibility. - The messages focus on complementary feeding from child nutrition cards.	This document is focused on the population below 2 years old.	Not RAISE-FS focus group. If needed, better to use existing BCC for under two years.
Time and age-appropriate IYCF messaging for HDAs and HEWs	Covers 8 visits, from the last month of pregnancy until the child is 18 months. Covering topics including early initiation and exclusive breastfeeding, preparation of fortified complementary foods, hand washing, the importance of dietary diversity, and responsive feeding -	This document is focused on the population from pregnancy up to 2 years old.	Not RAISE-FS focus group. If needed, better to use existing BCC for under two years.
A poster on healthy snacks	Benefits of Consuming healthy snacks to boost energy of school children throughout the day	This poster has a massage only about snacks for adolescents.	Good to adapt and consider in the new BCC
A poster on breakfast	Benefits of consuming breakfast for school children	This poster has a massage only about breakfast for adolescents.	Good to adapt and consider in the new BCC
Diet diversity poster	- In addition to staples like bread, injera, false banana, and kolo, consume milk, kale/pumpkin, and legumes daily - Consuming food from these three food groups will enable you to gain micronutrients vital for your growth and strength, healthy eyes and clear sight, and prevention from diseases	This poster has a massage only about dietary diversity for adolescents.	Good to adapt and consider in the new BCC
A guide for teachers and school club leaders	- Measure, Calculate, and Interpret Body Mass Index	The document provides information about BMI measurement	Too health focused, this is more appropriate for a health worker, not something which is needed at the farmer level.
Poster for volunteers	Improving girls' nutrition for healthier generations! - Discuss with parents of adolescent girls to ensure family support for adolescent girls to consume breakfast before leaving home for school. - Encourage parents of adolescent girls to provide their daughters with nuts, beans, or fruits for the girls to consume during school recess and boost their energy, enabling them to be active learners. - Counsel parents to enable their adolescent children to consume beans, eggs, and milk at least once a day to meet their nutritional needs, enabling them to grow healthy and strong.	This document is focused adolescent nutrition	This could be interesting as a group which is less targeted by other nutrition messages.

	Proper Nutrition for Adolescents HEW's Reference Guide	**For parents** includes messages on dietary diversity (5 food groups), importance of regular meals including breakfast, healthy snacks, hand washing, and avoiding high sugar, high fat and high salt foods. 1. **For adolescents** includes the same messages and an additional message on monitoring your BMI to ensure you maintain a healthy weight.		This document requires adjustments based on food-based dietary guidelines to include all the key messages.
	Proper nutrition for adolescent teacher's reference and facilitation guide	Principals and teachers can play their part by performing the following key tasks. 5. In terms of improving diet diversity and diet quality 6. In terms of promoting healthy food choices 7. To improve practices of personal hygiene 8. As regards keeping them focused on completing their education and choosing a healthier lifestyle		This document requires adjustments based on food-based dietary guidelines to include all the key messages.
	Adolescent Nutrition Passport	Benefits of each of the 5 food groups Animal source food; Milk and milk products; Legumes; Leafy dark green vegetables; Yellow-coloured fruits, how much to eat in a day, handwashing and BMI		This document requires adjustments based on food-based dietary guidelines to include all the key messages.
	Tools for Delivering School-Based Adolescent Nutrition Interventions	Tools presented include interpersonal communication, community mobilization, strategic use of data, and a supervision checklist.	This is important as an approach. It's not specific dietary advice	The approaches outlined here could be useful for changing dietary patterns
UNICEF (November 2021)	GENDER, SOCIAL DEVELOPMENT, AND NUTRITION MAINSTREAMING IN PSNP	Much of the document is focused on the Productive Safety Net (PSNP) 5 program including links to nutrition and other social services provided. Some key concepts are also described including: Gender and Social Development (GSD), Nutrition, Health, and WASH	This document provides more general information about nutrition, gender, and WASH	The summary of the basic may be useful for reasoning the importance of dietary advice and need for translation of dietary advice into specific messages.
USAID	Nutrition education training for agriculture extension officers	The document includes steps to Integrate nutrition into urban garden activities and Increase knowledge of nutrition for the first 1000 days, as well as the broader family Basics of food handling, storage, and safe preparation; Building skills for integrating nutrition with agriculture Conducting food demonstration Conducting group nutrition education with diverse audiences including adult caretakers; orphan and vulnerable children	This document focuses population below 2 years, and the basic skills required for nutrition implementation.	Not RAISE-FS focus group. If needed, better to use existing BCC for under two years.

Resilient Agriculture for Inclusive and Sustainable Ethiopian Food Systems (RAISE FS)

www.raise-fs.org

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Resilient Agriculture for Inclusive and Sustainable Ethiopian Food Systems (RAISE-FS) is a four-year program funded by the Dutch Embassy in Addis Ababa and hosted by Stichting Wageningen Research Ethiopia based in Addis Ababa, to bring about transformation in the Ethiopian food system. RAISE-FS will develop and implement a demand-driven and interdisciplinary approach to Research for Food System Transformation (R4FST) and as such contribute to the Government of Ethiopia's transformational agenda.