

# Getting to the Root: Integrating Nutrition and Agriculture for Improved Food Security

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# Introduction

In 1978, the United Nations General Assembly announced that [enough food was being produced to feed the world](#). Since that year, food production has nearly doubled, and yet, as many as [783 million people](#) still face hunger. According to the [2023 State of Food Security and Nutrition in the World report](#), the prevalence of moderate to severe food insecurity also remains alarmingly high, affecting approximately 2.4 billion people, which accounts for nearly 30% of the global population. In the face of persistent and concerning statistics, the urgency of addressing food security has never been more evident. This is the second consecutive year of stagnation in progress to end global hunger, intensifying the need for immediate action.

The impact of food insecurity is felt disproportionately by vulnerable groups, namely women, children and individuals living in rural areas. In 2022, over 33% of adults living in rural areas globally faced food insecurity. Furthermore, an estimated 148.1 million children under the age of five (22.3%) were affected by stunting and 45 million (6.8%) were affected by wasting in 2022. These disparities in child malnutrition were especially pronounced in rural areas.

3.1 billion people – 42% of the global population – were unable to afford a healthy diet in 2021, and the challenges of food affordability are acutely evident in African countries, where low-income households in peri-urban and rural areas face immense hurdles compared to urban centers. Households in peri-urban and rural areas would need to more than double their food expenditure to secure a healthy diet, underscoring the severity of the situation in these communities. Many rural households do not produce the majority of the food value they consume. In communities that solely practice rainfed agriculture, it is common for families to experience hunger between harvest seasons. The timing between harvests is often referred to as the “hunger months” or “lean season” and can last between three to nine months – if not longer – depending on location and environment. From a farmer’s perspective, the environment controls farming. Uncontrollable circumstances such as droughts, heavy rains, wildfires, conflict and the increasing cost of farming inputs all threaten food security by challenging the availability and affordability of nutritious foods.

Nutrition is also an essential component to food security. Even if food is abundant, an individual can still be food insecure if the food they have is of poor quality. Diet quality includes four key aspects: diversity, adequacy, moderation and balance. Food that is available and accessible must be nutritionally diverse. There must be enough nutritionally diverse foods to sustain a healthy life. Consumers must understand the difference between nutrient-rich and nutrient-poor processed foods and show restraint in consuming the latter. There must be balance in consuming

macronutrients to avoid non-communicable diseases caused by excess carbohydrate intake. Diet quality starts with agriculture. The production of food will determine the diversity, adequacy and balance of foods available for consumption, thus directly impacting nutrition status.

Nutrition-sensitive agriculture can best address both gaps caused by food affordability and nutrition. Nutrition-sensitive agriculture increases nutritious food access and lessens the financial burden of purchasing nutritious food. Addressing food insecurity calls for a [comprehensive approach](#), recognizing the interconnection between agriculture and nutrition.

Nutrition is often under-prioritized in food security programming, though, because nutrition programming is categorized as a health initiative, which silos nutrition response and programming from both health and food security. This omission was understood by international agencies. In 1990, a shift in focus and language occurred when the phrase “Nutrition Security” was established to address the under-promotion of nutrition within food security. Through government initiatives such as [The Global Food Security Strategy](#) (1996) and [Feed the Future](#) (2010), the international development community has attempted to mitigate food insecurity and malnutrition. While food security and nutrition programming have been implemented and had positive impacts, there is still a lack of equal representation of nutrition within food security initiatives and programming.

Rise Against Hunger, an international nonprofit organization founded in 1998, is growing a global movement to end hunger by empowering communities, nourishing lives and responding to emergencies. Rise Against Hunger aims to increase representation of nutrition within food security programming, starting with the organization’s own initiatives. The objectives of this paper, authored by Rise Against Hunger’s Bryan Pride and Chelsie Azevedo, are to:

1. Demonstrate the need to strengthen the integration of nutrition and agriculture concepts within food security programming.
2. Offer recommendations on how to integrate agriculture and nutrition within food security programming at the community level.

Through the use of interviews with current Rise Against Hunger project participants, case studies of Rise Against Hunger Empowering Communities projects, global documentation of food security programming and the 2023 State of Food Security and Nutrition report, Rise Against Hunger will provide analysis of current gaps within global food security programming, and provide recommendations on methods that can be adopted to strengthen food security programming. Project participant interviews and case studies referenced in this paper are from communities in both East and West Africa.

# Analysis of Agriculture’s Role in Current Food Security Programming

Food security programming is diverse. Many international non-government (INGO), private sector and government-sponsored agencies implement food security programming. To better understand how food security programming success is measured, USAID funded the [RFS Evidence Aggregation for Programmatic Approaches \(REAPER\)](#) project to create visual evidence gap maps for food security and resilience programs implemented worldwide. Their research revealed that outcomes of interest are input adoption, yield, farmer income and household poverty.

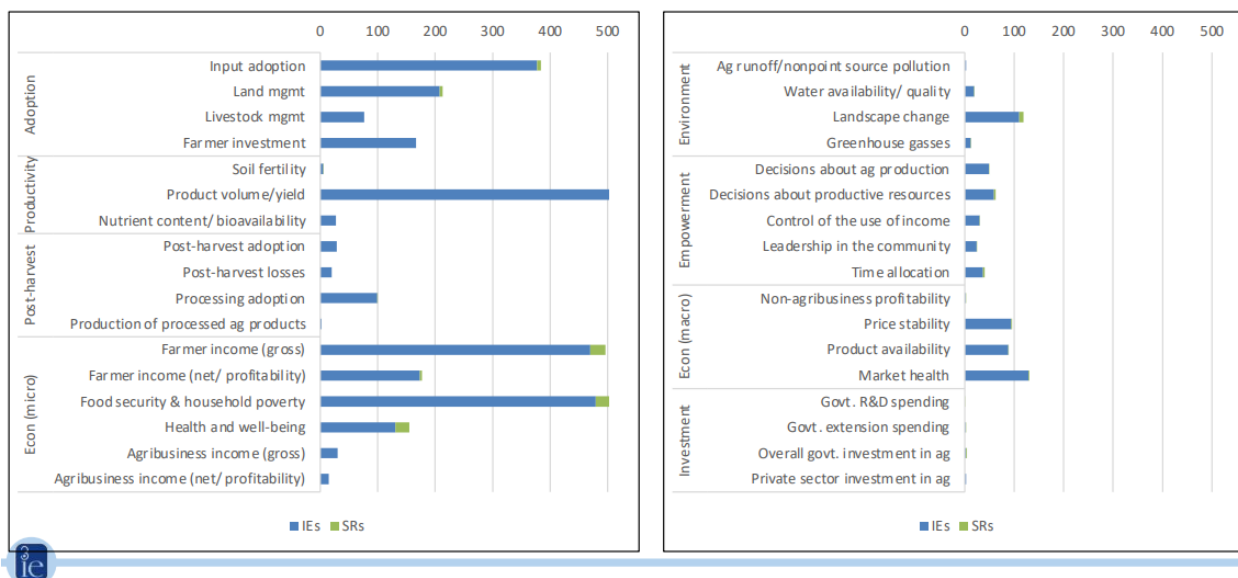


Figure 1: [Outcomes Evidence Gap Map for Agriculture-Led Food Security and Resilience Programming Worldwide](#)

In the United States, Feed the Future (FTF), which was launched by the Obama administration, is one of the most referenced models for approaching food insecurity from an American INGO perspective. Feed the Future programming has reached an estimated [23 million lives](#) through various initiatives. Most notably, FTF programming addresses poverty, one of the main contributors to food insecurity. Through FTF initiatives, farmers identified as vulnerable to food insecurity are encouraged to adopt improved farming techniques, plant [improved seeds](#) and learn post-harvest processing practices. The main goal for engaging farmers through FTF initiatives is to directly address the link between agriculture and income generation.

Income-generation initiatives are also heavily promoted in food security programming globally because they directly tackle the link between poverty and food insecurity. The adoption of these





practices is believed to increase farmers' yields. When yields increase, farmers take their harvest to market as a raw good and generate income from their sales. The greater the yield, the more income generated. In addition to improved farming practices, food security programming often supports farmers with skill-building related to raw-good processing, small business management and financial management.

Farmers learn how to add value to raw goods by processing them into final goods. For example, groundnut farmers can send their harvested groundnuts to market to be sold as a raw good, or farmers can process the groundnuts into groundnut paste (peanut butter). Processing adds value to the harvested groundnuts, enabling farmers to sell their harvest at a higher market value.

Income-generation activities also support farmers in developing skills to start small businesses and/or participate in Village Savings and Loans Associations (VSLAs). VSLAs focus on microfinance opportunities through communal saving groups. VSLAs establish community-monitored savings groups composed of 25 to 30 people who meet weekly to contribute to both group and individual saving accounts. Collective group savings can then be used to offer microloans to group members. Each group determines a timeframe for the microloans to be paid back, and some groups require interest to be paid on the loan and the interest payments contribute to the group savings. VSLA participation empowers farmers to save money earned from income-generation activities and enables them to take out low-risk loans for farming or business inputs, strengthening small farming and business opportunities.

Women are excluded from the ability to earn an income and influence household financial decisions. In many West and East African communities, cultural ideologies and practices can act as barriers for women to have financial control or decision making within their households. Households in West and East Africa are typically headed by men and gender roles significantly influence a family's cultural ideologies and practices regarding food. Gender roles and power

dynamics within households directly influence monetary decisions; men often hold the final decision on how income is spent. When men are targeted to participate in income-generation initiatives, research shows that men are more likely to spend their earnings on themselves rather than on food, school fees or other livelihood expenses for family members. Because of gender roles, [the responsibility of paying for food, school fees and other need-related expenses falls to the matriarch of the household](#). Research also shows that when women are empowered to generate income, women will save the money and spend their earnings on their children and ways to improve the household overall. This was observed in interviews with women farmers in Malawi, South Sudan and Mali that all corroborated the same trend: men spend their money on entertainment and social activities (alcohol and sporting events) while women spend money to maintain the household. Women, therefore, play a significant role in influencing the nutrition of their children and must be targeted through income-generation initiatives.

## Food Security Programs Fail to Incorporate Nutrition

While food security programming has been impactful by supporting farmers with income generation and opportunities to strengthen their livelihoods, the focus on poverty elimination has started to overshadow needed nutrition activities within food security programming. Nutrition, as it relates to food security, is very limited. This was evident in [USAID's REAPER project results](#), which showed significant gaps in measuring soil fertility, nutrient content and post-harvest management. This means that global food security programs focusing on agriculture tend to concentrate on promoting yields and income but ignore nutrition.

The elimination of poverty does not mutually indicate the achievement of food security. Poverty is only one piece of the food security puzzle; similar to how income-generation initiatives are used to directly target poverty, food security programming needs to also directly target malnutrition through the incorporation of nutrition programming. Food security programs must be intentional about addressing and preventing nutrient deficiencies.

When nutrition is not deliberately addressed and prioritized within food security programming, nutrition falls to the wayside. Interviews conducted by Rise Against Hunger and implementing partner AMEDD with farmers and household members in Mali found that when farmers are encouraged to focus on income generation, they understand the initiative's objective to just be "produce food to sell for income, use income to buy nutritious foods." The encouragement to produce food for sale motivates farmers to produce cash crops and practice monocropping, rather than motivating farmers to produce diverse varieties of nutritious foods that can be immediately consumed by the household.



This occurs because farmers are faced with a false dichotomy of needing to choose between either selling their farm yields for income or consuming their yields for household nutrition. In households where men are the decision makers of finance and household practices, they will often choose income generation for personal gain, as shared earlier in this paper, over consumption for household nutrition.

To dispel the perceived dichotomy, food security programming should emphasize the significance of nutrition and implement methods that empower farmers to make decisions that ensure both income generation and household nutrition from the same harvest.

## Understanding Why Food Security Programming Is Not Integrated With Nutrition

Most nutrition incorporation practices within food security programming are currently focused solely on utilization, one of the pillars of food security used to represent how food is prepared. Utilization promotes nutrition in meal preparation. Food security programming addresses utilization because it ensures that when farmers receive improved seed varieties or specialty crops, they understand how to prepare the foods, which leads to increased adoption of farming the improved crops.

An unforeseen outcome from the promotion of improved and fortified seed varieties is the development of negative stigma toward indigenous crops. Interviews with food security program participants in East and West Africa demonstrate this, with participants stating they believe indigenous crops and local recipes are not as nutritious as the promoted crop varieties. This negative stigma that indigenous crops are inferior has contributed to increased scarcity of indigenous crops because households lack incentive to cultivate them.



Beyond training on utilization of targeted food commodities, food security programming does not intentionally incorporate other elements of nutrition and/or malnutrition prevention. One of the main reasons for this is most nutrition programming being siloed into global health initiatives, as stated earlier. When nutrition is siloed as a health initiative, severe and moderate malnutrition is often addressed from a medical treatment and response protocol rather than a malnutrition prevention strategy. The incorporation of local foods or indigenous crops is rarely, if ever, used as a health initiative.

Food security programming has the ability to incorporate nutrition through malnutrition prevention strategies, which differ from malnutrition response programs. A malnutrition prevention strategy works with communities and households to understand causes of malnutrition and what can be done to prevent malnutrition from occurring. These types of programs incorporate the use of home gardens, family farms and knowledge building around what malnutrition is, how it occurs and what practices can be adopted on a household level to prevent malnutrition.

When participating in programming focused solely on malnutrition response, households develop the mindset that malnutrition cannot be prevented, thus disempowering mothers and family members from taking preventive measures. From interviews with women participating in Empowering Leaders Through Nutrition-Smart Agriculture, a nutrition-sensitive agriculture program implemented by Rise Against Hunger and Lift Up the Vulnerable in South Sudan, it was learned that it is a common belief that malnutrition cannot be prevented, only treated. Mothers participating in the program referred to malnutrition as “the sickness” and believe it is “an act of God that cannot be prevented.”

These challenges outlined can be addressed through intentional incorporation of nutrition into food security programs. Food security programs incorporating nutrition have the unique opportunity to empower women and community members to prevent malnutrition by focusing on the importance of consuming food grown in home gardens and farms. If farmers are encouraged to consume food first and sell remaining produce second, it creates a balance between income generation and nutrition promotion, both of which are necessary for individuals to be food secure.



# Case Study: Nutrition or Income in Mali

Starting in 2019, AMEDD, a Malian national development organization, has been implementing the Elevating Women and Youth Farmers program in partnership with Rise Against Hunger. The Elevating Women and Youth Farmers program targets women, mothers and youth in Sikasso and Segou communities and works to improve food security among these populations through three specific stages.

The first stage included land tenure for women. Due to cultural and societal expectations, only 5% of Malian women are landowners. Land ownership and large-scale farming is considered to be just for men. The first stage of the project, therefore, focused on social behavior change communication, such as consensus building with village leaders and men and radio listening clubs on the importance of women owning land, to promote granting land to women. This first stage led to 3,000 women culturally and legally owning their own land. This was a profound moment for women in the communities served by the Elevating Women and Youth Farmers program.

During the second phase of the project, the women who had received land were taught conservation agriculture techniques to use on their newly tenured land. Many of the project participants stated there were limited opportunities for women to generate income. As a solution, 75 participants collectively brought their land together to start a market garden where they could grow leafy green vegetables and indigenous crops to be sold in nearby markets, supporting income generation.

While some participants focused on market gardens and received training on income generation, other participants received training in home gardening. Home gardens were used primarily to promote women growing vegetables for everyday consumption within their households. Women who participated in the home garden training also received capacity strengthening in the preparation of indigenous crops to address the prominent presence of malnutrition within the communities served.

As the second phase neared its conclusion, AMEDD collaborated with Rise Against Hunger on the formation of community focus groups to identify the strengths and gaps within the Elevating Women and Youth Farmers project. Focus group participants included 40 participants and were comprised of women involved in the project's previous phases, the participants' husbands, youth participants and community leaders. The individuals were split into multiple focus groups, with consideration for power and gender dynamics, to enable all participants to feel comfortable with responding to questions openly and honestly.

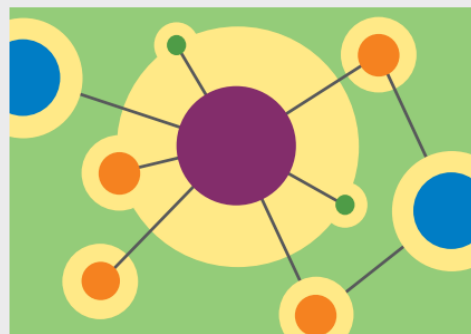
## Focus Group Findings

The most significant findings from the focus groups were centered around the disconnect between income generation and nutrition management. Women who participated in market gardens shared that they enjoyed having an opportunity to access land and cultivate vegetables that could be used to generate income. The women used their income to pay for school fees, health related costs and investing into other small business enterprises. The women also shared that having the market garden in town, rather than having to travel to markets outside of the community, was positive because it reduced their possible risk of violence related to ongoing conflict in Mali.

The women who received training in home gardens and nutrition expressed appreciation for having access to home gardens. The establishment of home gardens meant that the women could access leafy green vegetables without having to travel long distances. These participants also received training on utilizing garden vegetables in nutritious recipes, and many spoke in their focus groups of the “nutritious porridge” recipe developed by AMEDD’s lead nutritionist Pierre Coulibaly. Ingredients used in the porridge were from home gardens started by project participants. Many of the women prepared the porridge for their children to combat malnutrition.

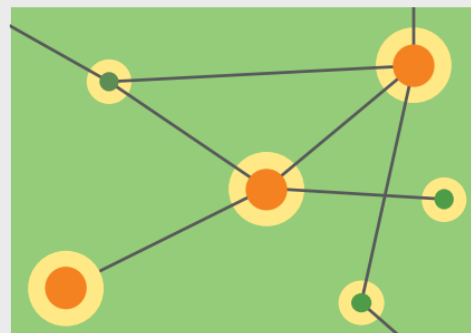
These results are examples of the empowerment that occurs when people have access to affordable and nutritious foods close to home. The women had less need to travel long distances and were able to promote local sales with their neighbors, which led to more equitable improvements in their community. The [2023 State of Food Security and Nutrition in the World](#) report (see *Figure 2* above) refers to this type of decentralization in markets and demand and highlights the inclusive growth and reduced inequalities when resources are closer to home.

A) DENSE METROPOLITIZATION AROUND LARGE AND INTERMEDIATE CITIES



- Centralized markets and demand
- More centralized economic growth
- Higher levels of economic inequality
- Increased risk of slums and urban poverty

B) DISPERSED SMALL CITY AND TOWN URBANIZATION



- Decentralized markets and demand
- Scattered centres of economic growth
- More dispersed non-farm employment
- More inclusive growth

● Large city ● Intermediate city ● Small city ● Town  
● Sphere of influence — Connectivity

Figure 2: Patterns of Urbanization

SOURCE: Adapted from de Bruin, S., Dengerink, J. & van Vliet, J. 2021. Urbanisation as driver of food system transformation and opportunities for rural livelihoods. *Food Security*, 13: 781-798. <https://doi.org/10.1007/12571-021-01182-8>



Through the focus group discussions, it was established that participants in the market garden groups and the participants in the home garden groups did not receive the same income generation and nutrition training. Participants expressed interest in receiving training that had been designated for the alternative groups.

As discussions furthered, it was discovered that many women participating in the market gardens stopped selling their produce and began consuming the vegetables at home. The women shared that their husbands were the reason for this.

In the male focus group, the husbands of project participants spoke of their appreciation for their wives being involved in the Elevating Women and Youth Farmers program. Many of the men shared that they had previously believed women should not own land, but they had changed their opinions and supported the idea after seeing what women were able to accomplish by owning land. The men shared that the market gardens enabled women to generate their own income, which then eliminated the need for the women to ask their husbands for money to pay for school fees and household items.

Since the men reported seeing positive benefits of the women selling market garden produce, they were asked why they had then encouraged their wives to discontinue selling the produce. Through this discussion, it was revealed that the men witnessed their wives' knowledge of the nutritious porridge and observed that the women had noticeably increased energy levels when they ate the porridge. The increase in energy was perceived to be extremely positive, so the men encouraged their wives to consume their produce instead of generating income through market sales. This shows that consumption was prioritized over income generation.

## Analysis of Focus Group Findings

The focus group discussions further demonstrated that Malian households often choose between earning an income and growing food for consumption, evident by the fact that women reduced the amount of produce being sold and instead increased their consumption. This demonstrates that both the women and men wanted to prioritize consumption because they visibly saw a direct correlation between eating nutrient-dense foods and their family's energy levels. This prioritization highlights the need to demonstrate that both actions, consumption and income generation, can occur simultaneously.

To address the false dichotomy that project participants were experiencing, Rise Against Hunger and AMEDD prepared an extension plan that would focus on strengthening nutrition knowledge by integrating it with agriculture.

## Applying Focus Group Findings to the Empowering Women and Youth Farmers Project

In January 2023, as part of the extension plan, Rise Against Hunger conducted a Training of Trainers workshop with AMEDD staff and Mali Ministry of Health extension officers and officials. The training focused on sensitizing AMEDD staff and government officials with integrated knowledge of nutrition and agriculture that could then be passed along to project participants and community members.

AMEDD and Rise Against Hunger agreed that this was a needed next step to help break down the silo between nutrition and food security and build understanding of how agriculture programming must integrate nutrition in order to address contributing factors of malnutrition.

## Project Update

As of August 2023, the Elevating Women and Youth Farmers project has begun integrating agriculture and nutrition lessons. When training on keyhole gardens, the AMEDD team incorporated a nutrition poster to visually show how each food grown in the garden impacts the body. The nutrition poster was also used to draw comparisons between concepts spanning both nutrition and agriculture, such as the importance of diversity for soil health as well as human health. Additionally, clinic workers have printed copies of the poster in their offices to teach patients experiencing malnutrition about the nutrition of local foods.



A health official in Mali proudly displays the food and body poster utilized in the Elevating Women and Youth Farmers project.



# Global Nutrition Programming

Organizations working on global nutrition use either nutrition-specific or nutrition-sensitive interventions. Nutrition-specific programming focuses on improving the short-term nutritional status of individuals, particularly vulnerable groups such as pregnant women, infants and young children. These interventions work to improve immediate dietary intake, promote optimal infant and young child feeding practices and prevent or treat micronutrient deficiencies, usually through supplementation. Examples of nutrition-specific interventions include providing vitamin and mineral supplements to pregnant women and young children, promoting exclusive breastfeeding for the first six months of life, and providing foods to prevent or treat malnutrition in children. These interventions often focus on improving individual behaviors and practices related to food intake and feeding to promote temporary improvements in nutritional status, with the goal of improving nutritional outcomes.

## Nutrition-Specific Programs Don't Address Malnutrition's Root Causes

Current investments in nutrition-specific programming provide immediate, short-term impacts and are crucial for emergency situations. However, in development projects, investing in agriculture initiatives could help to address the root causes of malnutrition and provide more sustainable, long-term solutions. These initiatives could include improving access to land, water and seeds, as well as providing training and support for smallholder farmers. By investing in local agriculture, communities could develop their own sources of nutrient-rich foods, rather than relying on external providers for cereal rations and expensive products like Plumpy'Nut®. As stated in an [article](#) written by Jessica Fanzo, Bloomberg Distinguished Professor of Global Food and Agriculture Policy and Ethics at the Johns Hopkins Berman Institute of Bioethics, the Bloomberg School of Public Health, I: "Plumpy'Nut addresses only one kind of hunger — acute episodes of extreme food deprivation or illness, the kind mainly associated with famines and conflicts. Plumpy'Nut is not designed for the other major kind of hunger, notably chronic hunger due to long-term poor diets. Nor is it designed to fight long-term malnutrition that is due to various kinds of chronic micronutrient deficiencies, such as iron, zinc and vitamin-A deficiencies." Despite this limitation in scope, Plumpy'Nut is still perceived as the solution to all forms of severe and acute malnutrition in many countries. This was observed in South Sudan where Rise Against Hunger partners with Lift Up the Vulnerable to implement the Empowering Leaders Through Nutrition-Smart Agriculture project. Our implementing partner informed us that the local clinic



closed its doors when Plumpy'Nut was out of stock. The clinicians saw no benefit in offering other services to those affected by malnutrition, which further perpetuated the belief among the community that Plumpy'Nut was the only option for stopping malnutrition.

It is also important to consider the impact of importing foods and foreign aid on local markets. By purchasing large quantities of food from foreign producers, local producers could be crowded out, thus contributing to a cycle of dependency on foreign aid. Supporting local agriculture and food production could instead help to build more resilient, self-sufficient and healthier communities. It is, therefore, important to work toward supporting local solutions that empower communities and promote sustainability.

Additionally, nutrition-specific interventions often focus on the individual, such as promoting exclusive breastfeeding or providing supplements to women and children under five, while neglecting other life stages, such as adolescence, adulthood and older adulthood. This limited focus ignores the fact that malnutrition is often a household issue, with multiple members being affected. Moreover, this approach overlooks the collectivism culture that permeates much of Africa. Prioritizing only the mother in caregiving programs leads to poor outcomes because it is often the mother-in-law, grandparent or other influential figure with the decision-making power. It also excludes fathers from being caregivers. This can lead to mothers feeling overburdened and isolated. Nutrition-specific interventions that do not engage households or immediate communities overlook this important cultural aspect and can reinforce harmful gender dynamics.

Access to nutrition-specific programs and food aid can be a significant challenge, particularly in low- and middle-income countries where malnutrition is most prevalent. In many cases, the distribution of food aid and nutrition-specific interventions can be limited by long distances and treacherous terrain, making it difficult for people to access the resources they need. For example, in many regions in Africa, it can take several days or weeks to make the journey to distribution

centers, where only small portions of staple foods may be available. This was observed in South Sudan where one woman walked barefoot for four weeks (two there and two back) to collect rice that would feed her family for two weeks. That is time she could have spent farming to feed her family for months.

Cultural and linguistic barriers can make it difficult for individuals to access information about nutrition-specific programs, too, and political instability can further exacerbate these challenges. For example, in Mali, there have been violent outbreaks near the communities served by the Elevating Women and Youth Farmers project. The women in these communities have been afraid to travel to clinics to seek nutrition support, so they stayed home with their malnourished children. Because these women were unaware of how local food production can prevent malnutrition, malnutrition was prevalent. Without safe access to malnutrition treatment at clinics, these women felt trapped in an inevitable cycle of poor nutrition for their children.

While nutrition-specific interventions are important for improving the short-term and immediate nutritional status of individuals, they often do not address the underlying causes of malnutrition, such as inconsistent access to nutritious food. The [2013 Lancet Nutrition Series](#) corroborated this, stating, “nutrition-specific interventions alone will only reduce stunting by 20%... leaving an 80% ‘black box’<sup>1</sup> which can only be addressed through nutrition-sensitive programming.” This “black box” is the integration of nutrition and agriculture. Integrating nutrition and agriculture can help address the main causes of malnutrition, freeing more time and resources for collaboration with other sectors to then address all of malnutrition’s root causes.

## **Nutrition-Sensitive Programming: Falling Just Short**

Nutrition-sensitive interventions connect to nutrition but are more focused on addressing the root causes of malnutrition to support improved nutrition status, including improved latrines, increased water access, improved healthcare, gender equity and increased smallholder farmer knowledge and market linkages. The World Food Programme, the global leader in nutrition-specific programming, recognized the need to go beyond solely providing food aid and decided to integrate nutrition-sensitive programming to their approach in 2017. However, it is clear that agriculture was not prioritized in this programming since it is not mentioned in the organization’s [minimum requirements for nutrition-sensitive programmes](#). This is commonly seen across nutrition-sensitive programs. While WASH and health programs, including water access and enhanced knowledge of clinic providers, are important to improving the nutrition status of

<sup>1</sup> Black Box- is a device, object or system whose inner workings are unknown, only the “stimuli inputs” and “output reactions” are known characteristics.





communities in Africa, agriculture is the production of food and must be included in any program addressing malnutrition. Good nutrition starts with nutritious soil.

Nutrition-sensitive agriculture programs prioritize the linkage between nutrition and agriculture: the production of food as well as its impact on the body. These interventions look to address nutrient gaps using agriculture. Nutrition-sensitive agriculture's rise in importance and attention has been driven by two leading agencies; the United Nations' 2030 Agenda for Sustainable Development includes agriculture as a means to support nutrition and health, and the Comprehensive Africa Agriculture Development Programme has prioritized nutrition in their agricultural investment plans. However, evidence for nutrition-sensitive agriculture programming showing improvements in nutrition status remains lacking. A review of nutrition-sensitive agriculture programs conducted by [Ruel, M. et al in 2018](#) found that there were still many gaps and weak evidence supporting the impact of nutrition-sensitive agriculture on improving nutrition. This was due to a variety of implementation methods – many of them ineffective. The authors found that nutrition-sensitive agriculture programs are only effective when they include behavior change communication, women's empowerment, a focus on households (rather than childhood stunting) and a strong understanding of cultural factors.

As noted through conversations with implementing partners in East and West Africa, recent efforts to incorporate nutrition into agriculture or school feeding projects have been challenging. When partners received nutrition workshops from international agencies and nutrition technical groups, the partners expressed feeling overwhelmed with the new terminology and unsure of how to practically apply the information. This can be seen in the 2022 program design guide from USAID's flagship food security initiative, Feed the Future. [Feed the Future's Nutrition-Sensitive Agriculture Design Guide](#) gives clear and practical instructions for designing a nutrition-sensitive agriculture project, but it lacks detailed guidance on how to effectively implement the plan. Implementation science, an emerging field, seeks to bridge this knowledge-action gap. The



Society for Implementation Science in Nutrition (SISN) focuses on addressing this gap in global nutrition programming and proposes a model that examines the following domains: objects of implementation (behavior, practice, etc.), implementing staff, enabling environment, households and communities and implementation processes.

During an [October 2020 webinar for SISN](#), Rise Against Hunger outlined our approach to addressing the different domains while navigating the challenges posed by COVID-19 restrictions. We shared how we modified our Training of Trainers program by using comprehensible videos on nutrition and agriculture practices and principles, in place of traditional in-person training. These videos allowed our implementing partner in South Sudan to continue project activities, ensuring seamless progress aligned with the seasonality. This approach helped avoid gaps in project implementation. The importance of project implementation methods becomes evident when reviewing the success of nutrition-sensitive agriculture programs. The 'how' of implementation plays a critical role in determining whether these programs will effectively impact the nutrition of communities.

# Filling the Gap: The Rise Against Hunger Approach

## Setting Context: Empowering Communities

Rise Against Hunger acknowledges the critical interplay between nutrition and agriculture, both of which are essential components of the food journey from production to consumption. Food security programs offer a unique opportunity to prevent malnutrition.

Rise Against Hunger has four strategic approaches to address food insecurity. Called our Pathways to End Hunger, these approaches both work to provide immediate nourishment for people facing hunger and work alongside communities to achieve long-term food security through nutrition-sensitive agriculture projects. These nutrition-sensitive agriculture initiatives, called Empowering Communities projects, bridge the gap between nutrition and agriculture. These programs emphasize the connection between food production and its impact on the body, aiming to address nutrient gaps through agricultural interventions and empower women and community members through capacity strengthening in home gardens, promoting the cultivation of indigenous crops and utilizing local recipes and cultural meals.

To ensure successful outcomes, it is crucial to integrate agriculture and nutrition considerations throughout both program design and implementation. Recommendations for how to do this are outlined in the table at the end of this document.

## The Food Journey

While many think of agriculture and nutrition as two separate areas, they are both a way of looking at the journey of food. Food is grown, harvested, processed, stored, prepared, consumed and, oftentimes, wasted or composted. Agriculture seemingly looks at food along its journey of production, harvesting, processing, storage, preparation and composting. Nutrition seemingly looks at food along its journey of preparation and consumption. The reality is each step of the food journey has both nutrition and agriculture components. For example, harvesting at peak time will ensure maximum nutrient density in vegetables versus harvesting early. Food production occurs in soil, where the food's nutrients are sourced, so it is important to think of soil's nutrient density as one produces food. The integration of nutrition and agriculture along the food journey are inseparable and must be conveyed together.

Some organizations, such as Malawi's Department of Agriculture Extension Services, are seeing the benefits of integrating nutrition and agriculture concepts in their projects. Malawi's agriculture extension services created a [Nutrition Handbook for Farmer Field Schools](#) to showcase simple methods for connecting familiar agriculture concepts to foreign nutrition topics. The handbook discusses the similarities between agriculture and nutrition as it goes through each of the food groups. This method is similar to how medical school curricula teach multiple topics (radiology, anatomy, physiology) by bodily system (cardiovascular, immune, lymphatic). This way of conveying information allows learners to draw from previous knowledge and easily build upon it with logical connections.



## Case Study: Hope for South Sudan and the Empowering Leaders Through Nutrition-Smart Agriculture Project

The Empowering Leaders Through Nutrition-Smart Agriculture project, jointly implemented by Rise Against Hunger and Lift Up the Vulnerable at Hope for South Sudan school and orphanage near Torit, South Sudan, exemplifies the power of a locally led, community-centered approach. Through a holistic programming journey, transitioning from emergency relief to empowered communities, the school's dependence on external aid has significantly reduced.

Initially relying on imported emergency aid for student meals, Hope for South Sudan received a container of Rise Against Hunger meals in 2019. However, their vision extended beyond immediate relief, aiming to establish a farm to ensure food and nutrition security for their students. Rise Against Hunger equipped Hope for South Sudan staff with sustainable farming techniques that prioritize nutrition from the outset, focusing on prevention, rather than treatment, of malnutrition.

Through Training of Trainers workshops, Hope for South Sudan staff acquired enhanced knowledge, attitudes and practices for sustained success, incorporating nutrition principles, food preparation and production skills and year-round nutrition planning. This comprehensive approach fostered better coordination between the agriculture, kitchen and food storage teams. This resulted in a remarkable increase in food production and nutrition, with Hope for South Sudan originally producing 0% of food for students to now generating 75% of all consumed food on campus through their farm. Dietary diversity improved from three food groups a day to an impressive 4.4 out of 5.<sup>2</sup> The children experienced enhanced energy levels, improved skin health

<sup>2</sup> Food Groups: 1) Staples 2) Legumes 3) Animal Source Foods 4) Fruits & Vegetables 5) Fats

and better school performance, with Peter Lomago, the school director, acknowledging the newfound appreciation for the significance of nutrition and agriculture, remarking, “Food can be both delicious and nutritious!”

Furthermore, Hope for South Sudan successfully improved the monitoring and management of malnutrition on campus, training the school clinician to screen for malnutrition using the BMI Wheel and symptom checklist. The kitchen staff also received training on preparing [Tom Brown](#), a traditional West African nutrient-dense porridge for malnourished children, which replaces unavailable ready-to-use therapeutic food/ready-to-use supplementary food products. As a result, malnutrition significantly decreased, from 26 cases of severe or moderate acute malnutrition in December 2021 to only two cases of moderate acute malnutrition and no cases of severe acute malnutrition as of December 2022. Throughout this time, there was zero recidivism into severe acute malnutrition.

In addition to agriculture and nutrition, the Empowering Leaders Through Nutrition-Smart Agriculture project integrated economic programming, training Hope for South Sudan staff in post-harvest loss mitigation and food processing for year-round food security. The school now aims to attain financial independence through farm sales and serve as a knowledge hub for community farmers, inspiring self-reliance and breaking free from the relief mentality.

Hope for South Sudan recognizes the distinctive impact of integrating nutrition and agriculture concepts, with teachers, students, clinicians, cooks and agricultural staff all attesting to its significance. This success has even led Hope for South Sudan to initiate their own household nutrition program, utilizing learnings from Rise Against Hunger’s training to provide nutrition support to community members. Moving forward, Hope for South Sudan is creating a farmer field school to promote household food security for the surrounding community, highlighting the importance of continued integration.

Hope for South Sudan Director, Peter Lomago, emphasizes the project’s uniqueness, citing its focus on sustainability and empowerment, enabling people to acquire knowledge, adopt positive attitudes, and implement sustainable practices to tackle malnutrition and food shortages. This approach sets the Empowering Leaders Through Nutrition-Smart Agriculture project apart from other INGO approaches that primarily focus on income generation in South Sudan. Integrating nutrition and agriculture emerges as a vital catalyst in challenging the relief mentality and fostering true empowerment within communities like Hope for South Sudan.





## Conclusion

Food security programming led by the international development community has adopted a standardized approach that has led to the siloing of agriculture and nutrition. As the contributing factors to food insecurity (i.e.: climate change, nutrition, poverty, conflict) continue to grow in complexity, it is imperative that programming becomes more diverse and pragmatic. Strengthening food security programming from the perspective of integrating nutrition and agriculture creates opportunity to address food insecurity from a comprehensive perspective.

Rise Against Hunger designs each program alongside our impact partners. Through collaborative program design, Rise Against Hunger's impact partners are able to address the root causes of food insecurity and malnutrition, creating opportunities to incorporate culture, indigenous foods and unique circumstances. This leads to impactful and sustainable outcomes.

Through initiatives including the Empowering Women and Youth Farmers program in Mali and the Empowering Leaders through Nutrition-Smart Agriculture program in South Sudan, it is evident that food security programming has the ability to address agriculture, nutrition and income generation. Rise Against Hunger programming focuses on sharing and applying content knowledge as a means to address food insecurity.

The common goal shared across the international development community is that food security programming empowers individuals to become food secure. Rise Against Hunger's approach to food security focuses on the how, and emphasizes the importance of knowledge as a key factor for empowerment. Programming that is contextual to culture, rooted in behavior change and utilizes locally available resources such as indigenous crops are all methods that foster empowerment and long-term sustainable impact.

# Recommendations in Action: Integrating Nutrition and Agriculture in the Empowering Leaders Through Nutrition-Smart Agriculture Project

| PROGRAM DESIGN RECOMMENDATION   | RECOMMENDATIONS IN PRACTICE   | KNOWLEDGE, ATTITUDE AND PRACTICES (KAP) FINDINGS  |
|---|---|---|
| <p>Use Knowledge, Attitude and Practices (KAP) assessments to determine how communities understand and perceive both agriculture and nutrition.</p> <p><b>KAP:</b></p> <ul style="list-style-type: none"> <li>• <b>Knowledge:</b> relates to what project implementers and participants understand about both agriculture and nutrition.</li> <li>• <b>Attitude:</b> relates to the attitudes and beliefs that project implementers and participants have toward agriculture and nutrition.</li> <li>• <b>Practice:</b> relates to the practices used by project participants. Practices or behaviors are influenced by the knowledge and attitudes that individuals have about nutrition and agriculture. For example, low knowledge about climate-related agriculture technologies can shape attitudes that farming is not possible, which leads to no practice of farming.</li> </ul>  | <p><b>Conduct KAP assessments</b> prior to any type of project initiative as a method to collect a baseline of the participants' KAP in specific topics.</p> <p>KAP findings are used to influence the design of the project to ensure that initiatives align with the needs, challenges and barriers that project participants face.</p> <p><b>Who:</b> In the Empowering Leaders Through Nutrition-Smart Agriculture project, both Hope for South Sudan staff and community members participated in a KAP assessment.</p> <p><b>How:</b> KAP assessment was designed to accommodate participants with low literacy and non-traditional education backgrounds. KAP was designed to be easily translated across multiple languages. In the Empowering Leaders Through Nutrition-Smart Agriculture project, an anonymous voting method was used where participants answered Yes, No, or I Don't Know. Participants were behind a barrier and placed a slip of paper in the envelope corresponding to their response for each question.</p> | <p><b>Knowledge:</b></p> <ul style="list-style-type: none"> <li>• In the Empowering Leaders Through Nutrition-Smart Agriculture project, many participants had little to no knowledge related to climate-related agriculture techniques.</li> <li>• Participants also had little to no knowledge of nutrition principles and how to apply nutrition concepts to everyday living.</li> </ul> <p><b>Attitude:</b></p> <ul style="list-style-type: none"> <li>• In the Empowering Leaders Through Nutrition-Smart Agriculture project, many participants believed that agriculture was not possible in South Sudan, leading to limited interest in practicing farming.</li> <li>• Many participants believed that nutrition could not be controlled within the household. It was an accepted belief that malnutrition was an act of "God's will."</li> </ul> <p><b>Practice:</b></p> <ul style="list-style-type: none"> <li>• In the Empowering Leaders Through Nutrition-Smart Agriculture project, Hope for South Sudan staff was interested in farming. Because they had access to land, they had the will to try farming despite thinking that South Sudan soil lacked fertility.</li> <li>• Community members were apprehensive to farm because of limited rains and the belief that the soil was not fertile.</li> </ul> |
| <p><b>Impact of Applying Recommendations</b></p> <p><b>KAP Agriculture Findings:</b> KAP findings showed that many farmers had little to no interest to practice farming due to prolonged droughts and the common belief that food could not be grown in South Sudan soils. This finding prompted the Training of Trainers workshops to focus on conservation agriculture and climate adaptation practices. Participants' knowledge around soil fertility, composting and mulching increased. The increased knowledge associated with climate-smart agriculture altered the attitudes that many had about farming, leading to community members taking techniques they learned from the Empowering Leaders Through Nutrition-Smart Agriculture project and applying them at their homesteads.</p> <p><b>Nutrition Agriculture Findings:</b> KAP findings demonstrated that many individuals felt powerless in their ability to prevent malnutrition. Training of Trainers workshops focused on strengthening nutrition knowledge related to causes of malnutrition, and practices to prevent and improve nutrition status. Training utilized hands-on learning, which included cooking demonstrations and home gardens.</p> <p><b>Overall Findings:</b> Participants had little knowledge of the connection between agriculture and nutrition. Increasing participant agriculture and nutrition knowledge drastically influenced adoption of Empowering Leaders Through Nutrition-Smart Agriculture concepts.</p> |   |   |

## Recommendations in Action: Integrating Nutrition and Agriculture in the Empowering Leaders Through Nutrition-Smart Agriculture Project (cont'd)

| PROGRAM IMPLEMENTATION RECOMMENDATIONS  | RECOMMENDATIONS IN PRACTICE   | IMPACT OF APPLYING RECOMMENDATIONS   |
|---|---|--|
| <p><b>Integrated Agriculture and Nutrition Training Curriculum</b><br/>The recommendation is to implement a curriculum that integrates nutrition and agriculture lessons. Lessons should be thematic allowing for cross-application of information.</p>   | <p><b>Integrated Agriculture and Nutrition Training Curriculum</b><br/>It supports increased retention of essential information and makes information more relatable even though it spans two technical fields.</p> <p><b>How:</b></p> <ul style="list-style-type: none"> <li>• Agriculture concepts were taught alongside nutrition concepts (e.g. teaching that compost requires diversity of ingredients similar to how human diets require diversity).</li> <li>• The curriculum's theme presented that nutrition is providing nourishment and healthy soils need nourishment similar to healthy bodies.</li> </ul>   | <p><b>Integrated Training Curriculum</b></p> <ul style="list-style-type: none"> <li>• In the Empowering Leaders Through Nutrition-Smart Agriculture project, all staff, (agriculture, kitchen and administrative) had capacity strengthened in both agriculture and nutrition, and could use common language to plan menus, use indigenous crops in school meals and foster better staff collaboration in post-harvest management.</li> <li>• Participants showed high acceptance and adoption of training concepts because information felt relevant, applicable and easy to remember.</li> </ul> |
| <p><b>Immersion Learning</b><br/>The training curriculum must be based on KAP findings and facilitated to incorporate adult learning methodologies and the use of locally available resources and materials.</p> <ul style="list-style-type: none"> <li>• <b>Use indigenous crops</b> because they can be found growing wild or for low cost. Indigenous crops are often held in high regard by elder members of the household, establishing familiarity with the crops and making it easy for participants to practice at home with no external support.</li> <li>• <b>Use traditional tools</b> because they can be found locally or be independently made. Using local tools (e.g., bricks, sticks, stones) demonstrates the applicability of the project initiative to the participant, encouraging easy adoption of intervention practices.</li> <li>• <b>Use visual training resources</b> that are simple. Use images of the local environment, languages and names and have limited text. Images should be clear and convey messaging through visual storytelling.</li> </ul> | <p><b>Immersion Learning</b><br/>This approach builds information into routine, which translates into applied practice. Hands-on learning simulates daily activities; if participants can see the applicability of the information and action to their daily lives, participants are more likely to adopt practices.</p> <p><b>How:</b> One example from the Empowering Leaders Through Nutrition-Smart Agriculture project is the thematic use of Good Nutrition Promotes Good Health.</p> <p>In agriculture lessons, the facilitator will call-back a nutrition lesson and have participants draw connections between the nutrition topic and the agriculture topic. Facilitators in nutrition lessons do the same practice to ensure continuity in lesson delivery.</p> <p><b>Why:</b> The theme of Good Nutrition Promotes Good Health can be applied to both agriculture and nutrition principles, reinforcing information learned from each training session and strengthening the participant's memory and understanding of technical content.</p> | <p><b>Immersion Learning</b></p> <ul style="list-style-type: none"> <li>• Empowering Leaders Through Nutrition-Smart Agriculture project participants showed high adoption rates of project concepts and applied them within their homesteads.</li> <li>• In addition to household level adoption, many Empowering Leaders Through Nutrition-Smart Agriculture participants have shared project learnings with family members and neighbors.</li> </ul>  |

## Recommendations in Action: Integrating Nutrition and Agriculture in the Empowering Leaders Through Nutrition-Smart Agriculture Project (cont'd)

| PROGRAM IMPLEMENTATION RECOMMENDATIONS  | RECOMMENDATIONS IN PRACTICE  | IMPACT OF APPLYING RECOMMENDATIONS |
|---|--|------------------------------------|
| <p><b>Immersion Learning (cont'd)</b></p> <ul style="list-style-type: none"> <li>• <b>Use teachbacks</b>, a facilitation style that incorporates the principles of Learn, Do, Teach. It is a method that enables participants to learn a concept, perform the concept and then teach the concept in order to reinforce learnings and strengthen the ability to cascade the information to others.</li> <li>• <b>Use inclusive facilitation</b> practices through personal stories of participants, music, song, dance, games and discussion as a means to demonstrate the reliability of project concepts, establish trust and create buy-in from participants.</li> </ul>  | <p><b>Immersion Learning (cont'd)</b></p> <ul style="list-style-type: none"> <li>• Practical lessons tied to information learning, such as the composting lesson, empower participants with confidence. They actively build the compost in the lesson, reinforcing that they know how to do the same activity at their homestead.</li> </ul> <p><b>How:</b> In the Empowering Leaders Through Nutrition-Smart Agriculture project, teachbacks were used as a technique to help the participants to successfully teach the integrated agriculture and nutrition principles to others as a method to cascade information and build institutional knowledge</p> |                                    |
| <p><b>Impact of Applying Recommendations</b></p> <ul style="list-style-type: none"> <li>• <b>Integrated Agriculture and Nutrition Training Curriculum:</b> Empowering Leaders Through Nutrition-Smart Agriculture participants have strengthened integrated knowledge, feeling confident and empowered by skills they learned. Project participants associate agriculture practices as a means to practice good nutrition. Prior to the Empowering Leaders Through Nutrition-Smart Agriculture project, many households experienced malnutrition recidivism due to most nutrition programming focusing on response rather than prevention. When agriculture is recognized as the key to achieve nutrition, households are able to practice daily actions that prevent malnutrition. Emphasizing consumption as the main objective of cultivating home gardens/farms shifts individual's mindsets to believing they have the ability to be self-reliant and uphold good nutrition within their households.</li> <li>• <b>Immersion Learning:</b> The use of imported materials or items not found within the community disempowers project participants because they become reliant on outside support for materials and resources required within a household. Vulnerable groups face challenges with purchasing expensive seeds and tools. Immersion learning is, therefore, essential to food security programming. The use of locally available materials within project training (e.g., indigenous crops, local tools) empowers farmers to apply project teachings within their homestead, promoting self-reliance and breaking the cycle of external support. Promoting the nutritional value of indigenous crops and local recipes preserves culture and promotes dignity and challenges the negative stigmas about local resources.</li> </ul> |  |                                    |



# Glossary

**Food Security:** The state of having access to sufficient, safe and nutritious food to meet dietary needs and preferences for an active, healthy life.

**Rainfed Agriculture:** A farming system that relies mainly on rainfall for water supply, rather than irrigation, to grow crops.

**Hunger Months or Lean Season:** The period between harvests when food supplies are limited, and households may experience food shortages and increased vulnerability to hunger.

**Nutrition-Specific Interventions:** Programs and initiatives specifically designed to improve the immediate nutritional status of individuals through targeted approaches like supplementation, food distribution and behavior changes related to feeding.

**Nutrition-Sensitive Interventions:** Aim to address the underlying causes of malnutrition by incorporating nutrition considerations into broader development initiatives, such as agriculture, WASH, health and women's empowerment.

**Malnutrition:** A condition of unbalanced nutrition, undernutrition or overnutrition, leading to adverse effects on health and well-being.

**Micronutrients and Macronutrients:** Elements and compounds in food that are required by the human body in small quantities (micronutrients) and larger quantities (macronutrients) for proper growth, development and overall health.

**Monocropping:** A farming practice where a single crop species is cultivated repeatedly on the same land, which can lead to reduced biodiversity and increased vulnerability to pests and diseases.

**Village Savings and Loans Associations (VSLAs):** Community-based financial groups where members pool their savings and provide low-risk loans to group members, promoting financial inclusion and empowerment.

**Behavior Change Communication (BCC):** Involves strategic communication approaches aimed at promoting positive behavioral changes, such as adopting healthier practices related to nutrition and hygiene.

**Gender Equity:** Refers to the fairness and impartiality in the treatment of individuals, regardless of their gender, ensuring equal opportunities and rights for all.

**Food Aid:** The provision of food assistance to individuals or communities facing food shortages or emergencies, often delivered through government or humanitarian organizations.

**Plumpy'Nut®:** A packaged peanut-based nutritional supplement used to treat severe acute malnutrition in children, providing a high-calorie and nutrient-dense source of food.

**WASH (Water, Sanitation and Hygiene):** An acronym representing programs and initiatives that focus on improving access to clean water, proper sanitation and hygiene practices to promote better health outcomes.

**Nutrition-Smart Agriculture:** Agricultural practices and initiatives that prioritize the production of diverse and nutrient-rich foods, aiming to improve nutrition outcomes within communities.

**Nutrition-Sensitive Agriculture:** Agricultural interventions that integrate nutrition considerations to address malnutrition and promote sustainable and resilient farming practices.