

Opportunities for Integrating Nutrition into Agricultural Information Systems in Northern Ghana

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About SPRING

The Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING) Project is a five-year USAID-funded Cooperative Agreement to strengthen global and country efforts to scale up high-impact nutrition practices and policies and improve maternal and child nutrition outcomes. The project is managed by JSI Research & Training Institute, Inc., with partners Helen Keller International, The Manoff Group, Save the Children, and the International Food Policy Research Institute.

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Acronyms

ADVANCE	Agricultural Development and Value Chain Enhancement
AEA	agriculture extension agent
AGRA	Alliance for a Green Revolution in Africa
ATT	Agriculture Technology Transfer
BCC	behavior change communication
CABI	Centre for Agriculture and Biosciences International
CARI	Competitive Africa Rice Initiative
CLTS	community-led total sanitation
COHA	Cost of Hunger in Africa
COP	Chief of Party
CSIR	Council for Scientific and Industrial Research
CWSA	Community Water and Sanitation Agency
DAO	district agricultural officer
DFID	Department of International Development of the United Kingdom
EAS	extension and (rural) advisory services
ENA	Essential Nutrition Actions
EPA	Environmental Protection Agency
FAO	Food and Agriculture Organization of the United Nations
FBO	farmer-based organization
FDA	U.S. Food and Drug Administration
FFS	farmer field school
FRI	Food Research Institute
GAIN	Global Alliance for Improved Nutrition
GAP	Good Agricultural Practice
GHS	Ghana Health Services
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GLSS	Ghana Living Standards Survey
GoG	Government of Ghana
GROW	Greater Rural Opportunities for Women
ICT	information communication technology
IFDC	International Fertilizer Development Center
IITA	International Institute of Tropical Agriculture
ILRI	International Livestock Research Institute

IP	implementing partner
IYCF	infant and young child feeding
LEAP	Livelihood Empowerment Against Poverty
MDAs	Ministries, Departments, Agencies
MEAs	Modernizing Extension and Advisory Services
MEDA	Mennonite Economic Development Associates
METASIP	Medium-Term Agriculture Sector Investment Plan
METTS	Monitoring, Evaluation, and Technical Support Services
MMDAs	Metropolitan, Municipal, and District Assemblies
MOFA	Ministry of Food and Agriculture
NaNuPaCC	National Nutrition Partners Coordinating Committee
NDPC	National Development Planning Commission
NGO	nongovernmental organization
NNP	National Nutrition Plan
NPDC	National Development Planning Commission
NRNCC	Northern Region Nutrition Coordinating Committee
OFSP	orange-fleshed sweet potato
PERSUAP	Pesticide Evaluation Report and Safer Use Action Plan
PBS	population-based survey
RING	Resiliency in Northern Ghana
SARI	Savanna Agricultural Research Institute
SBC	social and behavior change
SFMC	Savanna Farmers Marketing Company
SILC	Savings and Internal Lending Communities
SMS	short message service
SPRING	Strengthening Partnerships, Results, and Innovations in Nutrition Globally
SSTP	Scaling Seeds and Technologies Partnership in Africa
SUN	Scaling Up Nutrition
USAID	United States Agency for International Development
VSLA	village savings and loan association
WASH	water, sanitation, and hygiene
WFP	World Food Programme
WIAD	Women in Agricultural Development Directorate
ZOI	zone of influence

Executive Summary

An increasing number of agricultural projects and activities are working to meet nutrition-related objectives. These enlist a variety of communication mechanisms and platforms—as part of a larger agricultural information system—to encourage farmers and other agriculture sector actors to adopt improved technologies and practices to increase productivity and profitability as well as availability and access to more nutritious foods. In this report, the Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING) project reviews the actors engaged in agricultural information dissemination in northern Ghana, their communications platforms, and the content shared in an effort to identify opportunities for making agricultural information system more nutrition-sensitive.

During April and May 2016, SPRING conducted semi-structured key informant interviews among stakeholders working in sectors that contribute to nutrition in the three northern regions of Ghana: Upper West, Upper East, and Northern. These sectors include agriculture; environment; health and nutrition; and water, sanitation, and hygiene (WASH). The objectives of the review were to—

- understand what communication mechanisms and platforms exist to support the generation, dissemination, and exchange of agricultural information
- determine what content is being shared through these mechanisms and where there is potential for nutrition-sensitive agriculture technical content to be incorporated
- identify opportunities to enhance and integrate nutrition-sensitive agricultural information related to existing practices.

The findings detail the range of actors who are providing agricultural information—from government and nongovernmental organizations (NGOs) to research organizations, private sector agriculture firms, and information communication technology (ICT) providers—and the communications platforms they use to disseminate technical content. Actors noted that providing information via multiple methods and platforms builds greater trust and resultant action among users, which confirms findings from SPRING’s systematic literature review on social and behavior change communication approaches (Lamstein et al. 2014). Findings reveal that although a range of information systems aim to support agricultural productivity and income generation, many do not reach their targeted population(s), and most do not focus on nutrition. Few efforts have been made to strengthen the inclusion of nutrition within these agricultural information systems; those that exist are poorly coordinated. Opportunities to strengthen content and delivery of nutrition-sensitive agriculture information abound.

Rather than create new systems, a significant opportunity exists for stakeholders in Northern Ghana within established agricultural information systems to disseminate a broader range of nutrition-sensitive information. SPRING identified five opportunities to reach more people, improve informational access equity, and promote nutrition-sensitive agricultural information:

1. A diversity of actors across the value chain is already promoting agricultural information.
2. Strong, accepted platforms and content exist for agricultural and nutritional information.

3. A gender gap exists in access to information that targeted efforts to reach women may bridge.
4. Value chain actors are well placed to promote content related to the use of agricultural income.
5. ICT platforms are growing rapidly and can reinforce information provided through other mechanisms.

For each of these opportunities, we discuss programming implications that may be considered in order to enhance and scale up development, dissemination, and use of nutrition-sensitive agriculture information. Capitalizing on these opportunities would require better coordinating content production, increasing efficiencies in message creation and delivery, and reducing transaction costs for those providing advisory services. This review concludes by suggesting next steps for the U.S. Agency for International Development (USAID) Mission in Ghana to further strengthen the integration of nutrition within agricultural information systems in the northern part of the country.

Opportunities for Integrating Nutrition into Agricultural Information Systems in Northern Ghana

An increasing number of agricultural projects and activities are working to meet nutrition-related objectives. Through an in-country review of key actors, mechanisms, and content areas, along with a review of relevant literature, SPRING documented information systems used in Northern Ghana to adopt and scale up new agricultural technologies and production practices. This paper provides an overview of the extension and advisory services and ICT used by the agriculture sector in northern Ghana and identifies opportunities to integrate nutrition programming into these systems.

Background

Nutrition-sensitive agriculture addresses the underlying causes of malnutrition through three pathways: food production, income generation, and women's empowerment.¹ SPRING hypothesizes that information systems used in agriculture—including extension and (rural) advisory services (EAS) and market information services—can amplify nutrition-sensitive agricultural programming by helping farmers adopt nutrition-sensitive agricultural practices.

Varied communication mechanisms are used to encourage farmers to adopt improved agricultural practices. Capacity building programs through public extension, the private sector, or agricultural programs may engage with farmers individually, in groups, or through contract schemes. These programs may employ ICT to extend the reach of farmer-to-farmer information sharing and often complement it.

Following the three pathways linking agriculture to nutrition, nutrition-sensitive agriculture strategies may aim to improve nutritional outcomes through agricultural production for home consumption or for sale to generate income while striving to empower women. Strategies being used

Key Concepts

- **Agricultural information system**—A system in which agricultural information is generated, transformed, transferred, consolidated, received, and fed back in such a manner that these processes function synergistically to underpin knowledge utilization by agricultural producers (Röling 1988).
- **Nutrition-sensitive agriculture**—This practice addresses the underlying causes of malnutrition through three primary pathways: food production, income generation, and women's empowerment. Nutrition-sensitive agriculture activities support food security, adequate caregiving resources, access to health services, and a hygienic farm environment.* These can complement *nutrition-specific* actions, which promote adequate diet and reduction of disease.

**"Environment" here includes home, farm, firm, and market—wherever agricultural activities take place.*

¹ For a detailed introduction to the agriculture-to-nutrition pathways, please refer to the [Improving Nutrition through Agriculture Technical Brief Series](https://www.spring-nutrition.org/publications/series/improving-nutrition-through-agriculture-technical-brief-series) (Arlington, VA: USAID/SPRING, 2014), <https://www.spring-nutrition.org/publications/series/improving-nutrition-through-agriculture-technical-brief-series>

include cross-training agriculture and health workers, introducing biofortified crops, promoting nutrient-rich commodities through value chain-based approaches, and/or using proven forms of food safety at each stage of production and consumption (Fanzo et al. 2013; Hawkes, Turner, and Waage 2012). A review of extension and (rural) advisory services (EAS) and health frontline workers found that neither agricultural nor health staff alone can provide all the information that rural farm households need to achieve positive nutritional outcomes (Fanzo et al. 2013).

Objectives & Methodology

Objectives

In May 2016, SPRING conducted a review of agricultural information systems, serving the USAID Feed the Future zone of influence (ZOI) in Northern Ghana and focusing on a variety of actors implementing activities funded by the U.S. Government and other donors. The aim was to describe current agricultural information systems serving Northern Ghana and to determine how nutrition-sensitive agriculture content could be promoted within these systems. Using the methodology described below, SPRING pursued three objectives:

1. Understand what communication mechanisms and platforms exist to support the generation, dissemination, and exchange of agricultural information.
2. Determine what content is being shared through these mechanisms and where there is potential to promote nutrition-sensitive agriculture technical content.
3. Identify opportunities to enhance and integrate nutrition-sensitive agricultural information related to existing practices.

Methodology

To address these objectives, SPRING conducted a desk review of the literature and undertook in-country field research to analyze agricultural information systems used across the Feed the Future ZOI in Ghana.

The desk review comprised published and gray literature covering a wide range of policy and program documents and articles about agricultural information systems, both globally and in Ghana. SPRING reviewed materials published through USAID activities and initiatives as well as materials of other public and private sector actors.

Fieldwork took place between April 25 and May 13, 2016. The team conducted semi-structured key informant interviews among stakeholders working in sectors contributing to nutrition in the three northern regions of Ghana: Upper West, Upper East, and Northern. These sectors included agriculture, environment, nutrition, health, and WASH. Interview questions (Annex 1, "Interview Guide") focused on—

- obtaining an overview of programs, activities, and key stakeholders involved
- obtaining an understanding of program-promoted technical materials and content
- understanding the communication mechanisms used to promote and disseminate content.

In interviewing USAID agriculture activities' staff, the team used a framework of nutrition-sensitive agriculture categories of practices to facilitate discussion and assess the technical content promoted through agricultural information systems (Annex 2, "Nutrition-Sensitive Agriculture Practices Framework"). Where applicable, the team also asked questions about gender and women's

empowerment strategies and issues relating to access to information by economically or socially marginalized groups, including both men and women.

SPRING conducted 40 interviews in Accra and Tamale (Annex 3, "Key Informants"). Key informants were selected from: the USAID/Ghana Mission and other donors; the Government of Ghana (GoG); USAID implementing partners and other international and local NGOs; aggregators; input suppliers; microfinance institutions; ICT service providers; United Nations agencies; and universities.

Findings

This report examines the gaps and opportunities for making agricultural information systems more nutrition-sensitive, using the Ghana case study. Findings are organized around the first two study objectives: 1) understanding the communication mechanisms and platforms that support the generation, dissemination, and exchange of agricultural information; and 2) documenting the content shared by these platforms. The analysis identified a number of opportunities for adding or further including nutrition within existing agricultural information systems in Ghana. We describe these gaps and opportunities in more detail below (see “Opportunities and Implications for Programming,” page 25).

Agricultural Information Systems in Northern Ghana

Context

Despite impressive economic growth and poverty reduction in Ghana over the last 20 years, undernutrition and poverty remain high, especially in the country’s three northern regions. Comparative results from the 2012 and 2015 population-based surveys (PBSs) of the ZOI highlight that significant progress in improving nutritional status and care practices is still needed. Although stunting has decreased 8 percentage points (from 36.0 percent in 2012 to 27.79 percent in 2015), rates of optimal infant and young child feeding (IYCF) remain suboptimal (USAID 2015). The 2015 PBS results reveal that among children under the age of six months, 52 percent of girls and 59 percent boys are exclusively breastfed, and 14 percent of children aged six to 23 months receive the minimum acceptable diet (USAID 2015). Because 44.7 percent of the workforce is engaged in agriculture (World Bank 2013), the government of Ghana recognizes the agricultural sector as important for reducing poverty. The three northern regions are among Ghana’s five most impoverished, with the incidence of poverty reported as 71 percent in Upper West, 46 percent in Upper East, and 44 percent in Northern Region (MOFA 2015; Ghana Statistical Service 2015). Child undernutrition is estimated to have cost the Ghanaian economy GH¢4.6 billion, or US\$2.6 billion, in 2012 (National Development Planning Commission n.d.).

Although a thorough evaluation of the coordination mechanisms for nutrition falls outside the scope of this study, the *“Social and Economic Impact of Child Undernutrition on Ghana’s Long-Term Development”* report published in 2016 by the National Development Planning Commission (NPDC) Ghana, makes key recommendations to government for the nutrition agenda (Box 1). The document points out that the Government of Ghana does not clearly articulate responsibility for nutrition and that coordination is ad hoc and calls for a one-stop information shop on nutrition plus greater coordination to facilitate the flow of information. The strong leadership required to create a multi-sectoral nutrition agenda and the strong coordination recommended in this report will serve not only to improve information flow, but also to garner financial commitments for nutrition from government and donors.

Box 1. Summary of Strategic Planning and Coordination Recommendations

The government of Ghana needs strategies and policy actions that can effectively contribute to reducing child undernutrition. Nutrition should be positioned as a key government development priority, with a statutory provision or benchmark that allows a certain percentage of the assembly's common fund to be spent on nutrition-related programs. The following strategic actions may support a comprehensive nutrition policy:

- A new nutrition directorate of the ministry of health should replace the nutrition department currently subsumed within the Family Health Division of the Ghana Health Service. A standalone nutrition directorate will allow stakeholders to solicit and enforce a strong government commitment.
- The establishment of a nutrition agency under the NDPC will be one step toward achieving a coordinated, multi-sectoral policy approach to nutrition. This agency should be given with a clear legal mandate to coordinate multiple sectors' activities so as to prevent ad hoc arrangements and duplication of efforts.
- Desk offices in key institutions, relevant ministries, departments, agencies (MDAs), and metropolitan, municipal and district assemblies (MMDAs) should be established to decentralize and facilitate better coordination of the multi-sectoral approach to nutrition.
- As part of a wider communication strategy, authorities should enhance information flow and reporting through a new Web site/portal dedicated to nutrition interventions in Ghana. The proposed one-stop public-information shop will continuously engage key stakeholders and subsequently help generate national policy debates about government funding for nutrition activities.

To sustain the national momentum for nutrition, it is imperative to increase government commitment to combating malnutrition as part of a broader strategy for improving welfare. This commitment might take the form of adequate allocation of funding across all relevant agencies and coordination of activities of international organizations and initiatives around nutrition issues in Ghana.

Together, these efforts will enhance the communication and coordination among governmental and nongovernmental strategic partners as well as the funding allocated to the relevant agencies (NDPC n.d.).

This emphasis on integration and coordination is also within the National Nutrition Policy (NNP 2016), which also points out the need to strengthen coordination mechanisms. To implement this policy, a strategy document is to be developed, to be coordinated at national and subnational levels (i.e., regional levels). However, the ministry of health is responsible for maintaining this policy through support to other ministries and development agencies for the implementation of nutrition-specific and nutrition-sensitive interventions. The policy also calls for the nutrition department within the Family Health Division of the Ghana Health Service (GHS) to be transformed into a new nutrition directorate. At the subnational level, local government's coordination structures are responsible for supporting the implementation and coordination of the policy themes and aims (NDPC n.d.).

The Medium-Term Agriculture Sector Investment Plan (METASIP) ran from 2011 and 2017 and at present is under revision. Component 1.2 details support for nutrition improvement, with a vision of reduced stunting and micronutrient deficiencies. Crop fortification is a major strategy, with consumer

education and training on food fortification and consumption of nutritious foods to be led by the Women in Agricultural Development (WIAD) Directorate within the Ministry of Food and Agriculture (MOFA) through the extension service. Much of the METASIP refers to strategies to increase income by strengthening value chains and promoting alternative livelihoods through productivity and food storage, with additional aspirations for irrigation and water management. The establishment of platforms to engage all stakeholders is also identified, with a common agricultural fund as its goal (MOFA 2015).

Within Ghana's system of government, MOFA holds the primary responsibility for providing agricultural information through the Technical Directorate of Agricultural Extension Services and the WIAD Directorate. Government extension services operate through agricultural extension agents (AEAs), who are managed through the district assemblies. Because MOFA is decentralized to the district assemblies, all agricultural activities must come from district assembly budgets. However, public extension reach is constrained, as estimates suggest a ratio of a single AEA per 2,000 households. If farmers have formed farmer groups, each with 30 members, it is reasonable to assume that each AEA is working with approximately 66 farmer groups. MOFA's operational budget further limits its ability to reach farmers effectively, given restricted funds for transportation, program development, extension program implementation, and in-service training (McNamara et al. 2014).

A variety of nongovernmental actors are also involved in developing and disseminating agricultural information, including nongovernmental organizations, private companies, financial institutions, and ICT providers. Donor-funded activities support MOFA AEAs and WIAD extension agents, private extension agents, farmer-based organizations (FBOs), and value chain actors to communicate with farmers on technical content. Despite the number of actors involved, a study by the USAID Modernizing Extension and Advisory Services project (MEAS 2013) found weaknesses in the agricultural information system, including a public extension system that does not reach the majority of Ghanaian farmers and a lack of coordination, communication, information sharing, and learning from experiences among actors implementing extension-like activities. The sheer number of actors within the agricultural extension area may be impeding coordination. An example of how this manifests is that although ad hoc invitations to training workshops and seminars hosted by other actors may reach AEAs and the district agricultural officer (DAO), they are rarely received by MOFA field staff (McNamara et al. 2014).

Additionally, public and private extension services do not reach all farmers across Ghana, and for those reached only about 20 percent are women (MOFA 2007), in part because of the lack of female AEAs (McNamara et al. 2014). Other platforms are increasingly being used to reach greater numbers of farmers and other actors within the agricultural market system. Such methods include rapidly ICT, demonstrating the potential to reach more people. The 2012–2013 *Ghana Living Standards Survey* (GLSS 6; Ghana Statistical Service 2014) found mobile phone ownership high at the national level (80 percent), lower in the ZOI. Field data for the Rural Savannah Zone indicates 64 percent of households own a mobile phone (Ghana Statistical Service 2014, 6). Although women may have greater access to mobile phones than ownership, nationally representative survey data from 2010 indicates substantial

disparities in women's and men's ownership of mobile phones (Oduro, Baah-Boateng and Boakye-Yiadom 2011).

Agricultural Information System Actors

A number of actors are involved in agricultural information systems in Ghana. These can be categorized generally as—

- government ministries and departments
- NGOs, both local and international
- academic and research institutions
- private sector agriculture firms
- ICT providers.

There is a great deal of overlap among actors, with each involved in the development and dissemination of technical content to varying degrees.

Government. The Ghanaian government is responsible for developing and disseminating technical content for government agriculture and extension services. Extension service content is regulated through several government bodies: MOFA technical directorates, the Council for Scientific and Industrial Research (CSIR)/Savanna Agricultural Research Institute (SARI), the Environmental Protection Agency (EPA), the Food Research Institute (FRI), and Ghana Standards Authority (Ministry of Food and Agriculture 2011; Council for Food and Industrial Research 2016). As noted, WIAD supports existing extension services with a focus on nutrition and gender. WIAD district officers are based within district agriculture offices and intend to disseminate training and work with farmers, especially women farmers, on nutrition education related to food production, value-added processing, food safety and hygiene, and food preparation, as support allows. A number of NGOs provide support to WIAD, which in turn trains women's groups and other farmer groups in collaboration with extension agents on crop production for biofortified crops, vegetable gardening, nutrition education, and food hygiene. Although it was beyond the scope of this review to describe MOFA extension services strengths and weaknesses, it is not surprising that SPRING found that the primary mechanism for agricultural information in Northern Ghana is the public extension system, which operates under the remit of the MOFA extension policy and is neither well-funded nor widely found at community level.

The WIAD technical directorate of MOFA is responsible for developing and validating government-generated content on food-related strategies to promote nutrition, including those produced or shared by other actors. These include nutrition education for production and diet improvement, value addition through food processing and preservation, food safety in markets and processing, and gender mainstreaming of all agricultural policies and programs. As part of an emerging multi-sectoral approach to nutrition, GHS and MOFA are cross-training AEAs on Essential Nutrition Actions (ENA), water, sanitation, food safety, and promotion of the orange-fleshed sweet potato (OFSP).

NGOs. NGOs implement a range of activities, many funded by donors such as USAID and the United Kingdom's Department for International Development (DFID). These activities may collaborate with or provide support to MOFA AEAs and WIAD, as well as with the private sector, to reach target farmers or value chain actors. Content shared through the development activities may be original or borrowed from other stakeholders, such as MOFA. Although there is no formalized process for content approval, all agencies are expected to seek engagement and approval from line ministries. If a government agency finds an item that it has not approved or that contradicts an approved message, the agency will demand that activities cease.

International research organizations. Collaborating with government ministries, research institutes, and universities are international research organizations, such as the International Institute of Tropical Agriculture, the Centre for Agriculture and Biosciences International (CABI), and donor-funded activities, which also contribute significantly to content development and dissemination.

Private sector. As for-profit companies' involvement in agriculture is rapidly growing and expanding, so too is its provision of information and advisory services (McNamara et al. 2014). Value chain actors also engage with farmers to share knowledge and market their products. Many input suppliers advise on the use of their products at point of sale or through on-farm demonstration sites.

ICT service providers. ICT companies are increasingly providing services directly to value chain actors and by collaborating with other stakeholders. Development activities often leverage farmer groups and networks to offer a limited-time free or discounted subscription, such as to the Vodafone Farmers Club, a mobile service package that allows free calls among subscribers. Content, either original or borrowed, is adapted to fit the ICT platform, most commonly via short message service (SMS) or voice messaging over mobile phones. There is no standardized approach to vetting messages, yet most ICT service providers employ a technical expert, such as an agricultural officer, to draft content that MOFA or WIAD then approves.

Although much content relayed by the agricultural information system originates with MOFA, partnerships among stakeholders result in organized efforts to share content and provide complementary programming. Although not active, the SUN platform in Ghana has a number of subcommittees structured to provide multi-sectoral platforms. However, specific government-led, nutrition-focused coordination mechanisms do exist:

- Operating at the national level, the National Nutrition Partners Coordinating Committee (NaNuPaCC), chaired by GHS, includes representation from MOFA through the directorate of WIAD.
- In each region, a regional nutrition coordinating committee (present in Northern Region and Upper East but not verifiably so elsewhere) falls under the regional government's regional coordinating council, also convened and chaired by GHS. In Ghana, all government functions are regionalized and subsequently decentralized to district assemblies. GHS is the exception, as it

still operates from a national management platform² with significant autonomy to regional level and less autonomy to district level (which reports to the regional level). As a result, agricultural budgets are managed through the district assembly, but health budgets are not.

- In Northern Region, collaboration is facilitated through the Northern Region Nutrition Coordinating Committee (NRNCC). The Nutrition Coordinating Council is chaired by the GHS and includes MOFA AES, WIAD, and NGOs. Quarterly meetings to discuss actors' regional-level nutrition activities are envisaged but often held ad hoc rather than scheduled regularly.
- The regional agricultural department organizes a northern sector coordination platform to share information. However, GHS nutrition officers do not attend.

Most credible agencies will ensure effective coordination with both MOFA and GHS on message development and will request both national and regional endorsement. Within the nutrition-specific agenda, partners also work with health promotion units at national and regional levels on message content and review.

Agricultural Information Platforms

A variety of platforms provide agricultural information in Ghana. The following are the most common platforms identified in this review.

Public extension services. Led by MOFA AEAs, these facilitate experiential learning on a range of platforms—for example, farmer-to-farmer communication mechanisms, farmer visits, field demonstrations, and cooking demonstrations. All activities rely on external funding. MOFA has been decentralized to the district assemblies and relies on the district for its budget allocation. The regional MOFA office provides technical oversight and support to districts as funding allows. Development activities such as the Resiliency in Northern Ghana (RING) project provide training and funding to district assemblies so that public extension services reach target populations.

Farmer-to-farmer communication mechanisms. Comprising specific interventions led by community extension volunteers, such as lead farmers, farmer-to-farmer communication mechanisms promote new practices by the project. Farmer-to-farmer interventions may deal with groups of farmers, such as farmer field schools (FFS), community gardening groups, or FBOs. The farmer-to-farmer approach is used by NGOs, AEAs, and WIAD in Ghana. FFS and community garden groups often specifically target women or other economically and nutritionally vulnerable groups. Our assessment found that nutrition-related information was more often promoted through FFS and community garden groups than through FBOs or outgrower business networks. Additionally, of the farmer-to-farmer platforms that target women, many link with health frontline workers providing nutrition-specific training on topics such as ENA or IYCF practices. Examples of farmer-to-farmer communication in Ghana include:

² Ghana's decentralization process as enshrined in the constitution designates district assemblies as the highest political, legislating, budgeting, and planning authority at local level. The Local Government Act (Act 462) of 1993 reinforces constitutional provisions.

- The RING project, SPRING/Ghana, and the Food and Agriculture Organization of the United Nations (FAO) use FFS and women's gardening groups to reach economically and nutritionally vulnerable households. SPRING/Ghana uses the FFS approach to reach approximately 7,500 farmers of "1,000 day households," those households with pregnant women and children under two years of age (Strengthening Partnerships, Results, and Innovations in Nutrition Globally 2016). SPRING/Ghana and RING also link training on IYCF for pregnant and lactating women with children under two. Both SPRING and RING work in partnership and through the government systems, first by developing joint work plans with line ministries in the focal districts and then by supporting the government agencies to conduct the activities. RING activities are conducted in some districts by directly funding the district assemblies. The RING and SPRING/Ghana projects, key nutrition-sensitive activities led by USAID/Ghana are summarized in Box 2.
- FBOs are grassroots organizations led and run by farmers themselves; MOFA encourages their development. Through FBOs, MOFA provides extension services to the group rather than to individual to disseminate technology rapidly and more cost-effectively (Ministry of Food and Agriculture 2016). However, the FBO structure in Ghana is weak. If functioning, FBOs more often receive information and services from donor-funded activities than from MOFA AEAs. Although 25,000 FBOs are registered with the government, estimates suggest that only 23 percent are functional (Owusu-Baah 2012; Ministry of Food and Agriculture 2015). Opportunities do exist to link FBOs to private sector information providers as in the case of Vodafone Farmers Clubs (page 11) or Esoko networks, but successful linkages would depend on their level of technology access and literacy. Because many FBO members are men, these linkages provide an opportunity to engage men in nutrition and gender-sensitive messaging.

Private sector business networks. These can be leveraged to promote agricultural information. Donor-funded development activities often engage with the private sector to support business management and entrepreneurship training and to facilitate business relationships—for example, to connect actors along the value chain. One example is an outgrower business network consisting of contract schemes between smallholder, resource-poor "outgrower" farmers and medium-sized farmers, as the buyers ("nucleus farmers"). These contracts are often facilitated by donor-funded activities that aim to develop the business capacities of both outgrowers and nucleus farmers. Although nucleus farmers are primarily men, several donor-funded activities make efforts to target and promote women as nucleus farmers, including the Greater Rural Opportunities for Women (GROW) project and to some extent through the USAID Agricultural Development and Value Chain Enhancement (ADVANCE) project. Project data from ADVANCE reveal that 45 percent of outgrower farmers connected to nucleus farmers through outgrower business networks are women. Yet despite targeting efforts, ADVANCE has identified just 10 female nucleus farmers to participate in the program (Agricultural Development and Value Chain Enhancement Project 2015). The relationship between outgrowers and nucleus farmers is a platform for farmer-to-farmer communication with potential to reach a range of value chain actors,

including better-off farmers, who are not typically targeted for nutrition activities. ADVANCE taps into this communication platform with messages on weather, prices, and agricultural tips.

Box 2. Key USAID/Ghana Nutrition-Sensitive Activities

USAID/Ghana activities RING and SPRING address undernutrition in the Northern Region through multi-sectoral, integrated programming.

SPRING/Ghana. This project's target group is 1,000-days households—households containing a pregnant women or a child under two. SPRING/Ghana has supported groundnut production while promoting increased consumption of groundnuts. Through the FFS approach, members work through the agricultural season, receiving a curriculum on food safety, nutrition, and water, sanitation, and hygiene (WASH). Lessons from the FFS curriculum heighten attention to storage and processing to reduce aflatoxin in the harvested and stored crop. SPRING/Ghana has used radio programs and text messages to reinforce practices taught at the FFS; these also cover weather so as to improve decision making around aflatoxin control. The reach of the text message is just over 4,000 farmers, primarily women. Originally, the intention was to reach more than 5,000 FFS members, but phone ownership became an issue at that scale.

SPRING/Ghana recently engaged in supporting OFSP and vitamin A-rich maize production by linking directly with mother-to-mother support groups to provide nutritious complementary food to children within their first 1,000 days. In this way, SPRING/Ghana directly targets nutritious crop production to support a critical IYCF behavior.

USAID/Ghana Resiliency in Northern Ghana (RING). Women of reproductive age with children under five from vulnerable households are the target of this project. A detailed community-based process takes place to target the most vulnerable within each district. To facilitate the targeting, men and women are sensitized as to the role of women as primary beneficiaries.

The project focuses on three primary component areas: agriculture and livelihoods; nutrition and WASH; and governance. Within the agriculture and livelihoods component, RING promotes both nutrition-sensitive agriculture, by identifying nutrient-rich crops for which women are responsible for growing, and promotes the household consumption of these crops as well as women's control of income from excess harvest. RING provides drip irrigation systems to support dry season irrigation of green leafy vegetables. Further, the project provides extension services to cultivate OFSP and soybeans, pigeon peas, and groundnuts—based on SPRING's success with groundnuts. Poultry is being piloted to promote home consumption of eggs and meat, especially by the first 1,000 days population, while excess eggs and meat can be sold to generate income to meet other household needs.

Cooking demonstrations take place for soy and OFSP; preparation techniques are discussed as well as dietary diversity, complementary feeding practices, maternal diet, food safety, and hygiene elements, including tippy tap demonstrations. These events are a joint endeavor of the AEAs, WIAD officers, district nutrition officers, and environmental health (EH) officers to promote household consumption, with a focus on the first 1,000 days population. Behavior change communication (BCC) methods are utilized to enhance the extension support. This includes radio broadcasts of both locally produced songs related to consumption of OFSP and a radio series highlighting nutrition-sensitive practices produced by SPRING being used across RING areas.

As RING directly supports the district government, support has been provided to train not only AEAs but also EH officers, community development officers, and School Health Education Programme teachers in Essential Nutrition Actions, highlighting key areas of crossover for each cadre. The RING project has focused on nutrient-dense crops and on supporting infrastructure and messaging to promote the production of these crops with a household consumption objective. Significant effort is made to target vulnerable women and ensure their engagement in nutrition-sensitive agriculture activities. Ensuring that key community events are managed across cadre brings a critical opportunity to ensure that agriculture messages are made more nutrition-sensitive.

Financial services and livelihood activities. These serve as platforms for promoting agricultural information to a limited extent. Financial service providers, such as the microfinance institution Sinapi Aba Savings and Loans, partner with development activities to offer trainings to their clients and other farmers. Some donor-funded activities, such as those provided through CARE and Catholic Relief Services, facilitate village savings and loan associations (VSLAs) among poor and vulnerable farmers, especially women. These VSLA group meetings are complemented with an educational component, such as on finance, agriculture, or nutrition. These initiatives are often externally funded, but government staff are supported to lead these efforts.

Information communication technologies. Increasingly they are used in Ghana to enhance, create, and scale up access to all types of agricultural information and to build on other communication platforms, including the public extension services described above. ICT can complement more traditional communication-based approaches by offering options for two-way communication between farmers and service providers, as well as data management for NGOs and MOFA. Stakeholders, including MOFA and NGOs, use ICT to share agricultural information with farmers and to collect and consolidate agricultural data for reporting, mapping, and improving service delivery to farmers.

In addition to radio programming, agriculture programs use SMS to send Ghanaian farmers tips and reminders by text message on their phones. A number of ICT approaches, including radio, SMS, voice messaging, and video are interactive, using polling and call-in centers to further facilitate learning. Many such services address literacy barriers with call-in centers (offered by ICT service providers Farmerline and Esoko), interactive voice response services (provided by VOTO Mobile), video, and radio.

SPRING interviewed a range of ICT providers working with NGOs promoting agricultural information through radio, video, mobile phone, and tablet applications. These types of services represent the most widely promoted technologies for medium-sized and smallholder farmers in Ghana (Modernizing Extension and Advisory Services 2013). Some examples include:

- Farm Radio International, which partners with the USAID Agriculture Technology Transfer (ATT) project, uses its participatory radio campaign approach and weekly programs to promote integrated soil fertility management and good agricultural practices (GAPs).
- Digital Green promotes GAPs through community videos, which are then disseminated through outgrower business networks using portable projectors that can be easily transported.
- MOFA has 22 “video vans” equipped to show video examples of agricultural production techniques to farmers. Although these videos are intended to extend MOFA’s reach, only two video vans are designated to cover the 27 districts in Northern Region.
- Ignatia provides a daily weather forecast and seasonal forecast through mobile phones, using satellite technology and the geographic coordinates of subscribers to ensure precision. It also trains extension agents to interpret weather data.

- Through the USAID ICT for Extension Challenge Fund,³ Grameen Foundation, Digital Green, and Farm Radio International are partnering with other USAID implementing partners to scale up messages and practices by layering mobile, video, and radio approaches, and documenting the effectiveness of the delivery mechanisms.
- Vodafone offers free calls between Vodafone Farmers Club subscribers, per their corporate social responsibility agenda.
- Esoko, Farmerline, VOTO Mobile, and Image AD bundle services and offer packages at different price points. At present, most rely on donors to fund free or low-cost basic services (such as SMS) for new subscribers, although Esoko and Farmerline have private farmer subscribers.

This review found no real limitations to the type of content that can be developed and continuously adapted. ICT providers interviewed indicated they could integrate nutrition messaging and services into a variety of media and could target specific audiences, such as women. However, their greatest challenge is in developing effective, technically sound messages. Such content is often developed in partnership with NGOs, through donor-funded projects. ICT providers in Ghana lack the ability to sustainably generate and update new content without external support. This review identified only a few ICT platforms that had sufficient demand to operate without donor assistance, and these typically provided high-demand information, such as for weather services and market information. An opportunity exists to add nutrition information to these services. All credible agencies engage with line ministries to review and approve content, but no structured approval process is in place and there is no resource library of approved messages. The *Cost of Hunger in Africa* report on Ghana (National Development Planning Commission n.d.) points to the need for these to energize the nutrition sector.

All the ICT service providers interviewed receive or have received support through donor-funded activities in some form. Development activities often leverage existing farmer groups and networks to offer limited-time free or discounted subscriptions, as noted. This partnership between development activities and ICT service providers helps the companies reach new clients and opens a platform for development activities to scale their reach. ICT service providers clearly reap the benefits, reaching potential new markets and building brand loyalty (when new subscribers value the information being received).

³ The USAID ICT Challenge Fund approach uses a bundled ICT-enabled information and technical support solution for farmers and agriculture extension agents. This comprises targeted information, engagement with the farmer to support behavior change, and a continuous feedback loop between smallholder farmers and extension officers (Grameen Foundation 2015).

Content Promoted through Agricultural Information Systems

All agriculture extension and advisory services in Ghana provide information on agricultural practices recommended for specific value chain actors. For this analysis, we focused primarily on identifying nutrition-specific or nutrition-sensitive content within agricultural information systems. In this section, we describe the basic agricultural content covered by agricultural information systems in Ghana and then explain how nutrition-related content is being promoted through and by the actors and platforms described above. It is essential that all agencies promoting nutrition engage with the multi-stakeholder platforms to ensure consistency with the government's nutrition agenda.

Agriculture Content

Agricultural information promoted in Northern Ghana is comprehensive yet tailored to the cropping system, agroecological zone, and objectives of the specific (public, private, and/or governmental) program. All the agricultural stakeholders interviewed reported being familiar with and promoting GAPs, including topics related to production and post-harvest processing, such as improved soil health, improved seed quality, and post-harvest handling. Some of these GAPs can also contribute to nutrition, such as by improving the availability of plant nutrients and minerals and by increasing food diversity, quality, and quantity. We found that agricultural content and GAPs are promoted on all communication platforms in northern Ghana. For example:

- AEAs disseminate GAPs related to production and post-harvest processing of soybean, maize, and rice in collaboration with Alliance for a Green Revolution in Africa (AGRA) and SARI.
- Outgrower business networks supported through USAID ADVANCE, USAID ATT, FAO, and GROW provide similar GAPs content on production and processing of key value chain commodities.

ICT service providers cited providing SMS reminders on production, post-harvest handling, and storage. For example, Farmerline partners with MOFA and NGOs to deliver timely (based on the agricultural seasonal calendar), crop-specific agronomic tips through SMS. Private field agents also reach farmers directly, while a call center is staffed with agronomists. Additional examples include:

- SPRING/Ghana and the World Food Programme (WFP) promote practices related to reducing aflatoxins and mycotoxins in maize and groundnuts. SPRING/Ghana promotes practices through FFS, while WFP builds capacity of outgrower businesses to promote food safety and quality standards for its Purchase for Progress Program. In addition, Nestle engages with farmers to directly manage value chains for maize so as to ensure product within FDA standards for aflatoxin. Private sector buyers are an important actor in the area of food safety, driving food quality standards for commercial-level production. However, commercial buyers for whom this is an issue directly manage the value chain rather than buy on the open market. Otherwise, these companies still import into Ghana rather than source locally, as Hershey's does with peanuts.

- CABI, an international nonprofit organization, works with CSIR and MOFA to systematize promotion of its PlantWise Knowledge Bank⁴ in Ghana, which provides crop information and integrated pest management guidance to farmers. CABI trains AEAs as plant doctors and is developing a mobile application that can be used by field agents to provide updated information on crops grown in the agroecological zones in Ghana.

Nutrition-Specific Content

Among the agricultural stakeholders interviewed, several explicitly integrate nutrition education within their platforms for agricultural information systems. The nutrition-related information was primarily linked to agriculture, focusing on:

- Diversification of food production and consumption
- Promotion of specific crops that are highly nutritious (such as OFSP)⁵
- Education on general nutrition, food groups, food hygiene, and food preparation

The GROW activity is working with value chain actors to explicitly integrate nutrition training and messaging (Box 3). Additional examples include:

- The USAID SPRING/Ghana project introduced FFSs for households with pregnant women, lactating mothers, or children under age two. In addition to receiving training on agricultural production and aflatoxin mitigation, participants are trained in basic nutrition, using the ENA approach.
- The USAID RING project works with MOFA and WIAD extension agents to provide nutrition education to vulnerable farmers and women's groups. RING promotes consumption of Vitamin A, protein, iron, and zinc by increasing production and consumption of OFSP, soy, and dark leafy greens.
- The USAID Soybean Innovation Lab partners with other activities—including USAID ADVANCE, ATT, and GROW—to promote soybean production, processing, and consumption through nucleus farmers and outgrowers.
- WIAD and GHS activities generate and disseminate technical content related to biofortified crops, nutrition education, and food hygiene, complementing other nutrition education topics,

Box 3. GROW

GROW works on the soybean value chain, exclusively targeting women nucleus farmers and outgrowers. GROW partners with the USAID Soybean Innovation Lab to provide training on the nutritional value, home processing, and preparation of soy-based foods. GROW also partners with Farmerline to facilitate access to mobile text reminders on weather and agronomic tips as well as access to its toll-free call center.

⁴ The [Plantwise Knowledge Bank](#) is an online and offline global repository of information on plant health. Its diagnostic resources, best-practices management advice, and plant clinic data analysis are available for targeted crops at country and regional levels.

⁵ The crops cited included soybeans, OFSPs, groundnuts, cowpeas, other legumes, leafy greens, and other cover crops.

such as ENA and IYCF. Health system actors in the community and at health facilities have the primary responsibility for sharing this information.

We found several examples of nutrition-related information included within ICT. At the same time, we found that nutrition-sensitive agriculture practices were promoted only through donor-funded interventions that specifically include a nutrition component. This points out the potential for these approaches to be further scaled up and expanded. The recently launched mNutrition activity (Box 4) conducts direct outreach to farmers and through NGO partnerships to increase subscriptions to its Vodafone Farmers Club. Other examples include:

- Farm Radio International partners with several organizations to promote production and consumption of OFSP through its participatory radio campaigns.
- Farmerline provides messages through SMS on the nutritional value of soybeans in its work with women nucleus farmers and outgrowers supported through GROW.

Box 4. mNutrition

mNutrition is the only ICT mechanism identified in Ghana that integrates production, harvest, and nutrition-related information into one service. Farmers can opt to receive information on the nutritional value of specific crops, food hygiene, and WASH, or general nutrition education. Messages are provided via SMS and through the Esoko Farmer Helpline, which is staffed by agronomists and nutritionists. mNutrition is a consortium effort, including technical partners CABI, Global Alliance for Improved Nutrition (GAIN), International Livestock Research Institute (ILRI), MOFA, and GHS, responsible for content development and validation.

Hygienic Environment Content

Practices that promote a hygienic household and community environment are linked closely with both agriculture and nutrition, although messages on the topics are often delivered separately in Ghana. SPRING interviewed a variety of stakeholders working within the agriculture, WASH, and health sectors and found many donor-funded activities that included information on WASH topics. Agricultural information systems addressed topics such as land and water resource management, safe use of phytosanitary products and farm inputs, and food safety. Practices associated with many of these topics contribute to nutritional outcomes; however, the examples reviewed did not explicitly provide nutrition education. Most messaging is dependent on external funding and is therefore ephemeral. Although costed plans exist, there is no evidence of direct government funding into message systems, so unless messaging is attached to other privately paid-for services, the future of the message delivery is uncertain.

Our interviews revealed a number of sources for the WASH-related content. MOFA, the CSIR/SARI, and EPA generate agricultural and environmental management technical content, while GHS and the Community Water and Sanitation Agency (CWSA) of the Ministry of Water Resources Works and Housing generate WASH content. USAID/Ghana implementing partners and some value chain actors

also cited the USAID environmental management guidance⁶ and Pesticide Evaluation Report and Safer Use Action Plan (PERSUAP) as sources of information. Information is disseminated through MOFA and CWSA frontline agents and through outgrower business networks, farmer-to-farmer models, and community-based organizations.

The Savanna Farmers Marketing Company, supported through the Competitive Africa Rice Initiative (CARI) and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), integrated WASH training with its agriculture extension approach (Box 5). Other examples include:

- The community-led total sanitation (CLTS) model adopted by programs supported by the GoG and USAID programs directly links hygiene behaviors and nutrition improvements. RING adopts five key times for hand washing and directly supports the CLTS district lead agenda in prioritized vulnerable communities. SPRING targets four critical behaviors for the 1,000-day household within its CLTS approach, with better nutrition as a goal.
- WIAD promotes food safety and hygiene related to food production and processing, mainly targeting vulnerable farmer groups.
- The USAID WASH for Health project works with CWSA and plans to promote: nutrition-sensitive practices related to food safety; reducing animal waste contamination; using a multiple-use water services approach; and other WASH topics. EH officers in each district in Ghana carry out extension services for CLTS. SPRING has worked with them extensively on the WASH 1000 agenda that targets four critical nutrition-sensitive behaviors. Messages are developed in partnership with CWSA in line with the governments adopted CLTS strategy supported by UNICEF.
- USAID ATT, USAID ADVANCE, and AGRA work through input supplier and outgrower business networks to promote safe use of farm pesticides and fertilizers.

Box 5. Savanna Farmers Marketing Company

The Savanna Farmers Marketing Company (SFMC) is a large aggregator of rice, maize, sorghum, and soybeans. Through a network of nucleus farmers and outgrower businesses, it reaches 26,000 farmers with small- and medium-sized farms. An estimated 20 percent of rice farmers in Ghana are female (Ragasa et al. 2013). SFMC provides training on GAPs to improve production and post-harvest handling, and standards. CARI and GIZ fund additional training to promote nutrition-sensitive and nutrition-specific practices, such as nutrition education for all family members, organic composting, intercropping, diversification, WASH, and food preparation, among others.

Gender-Related Content

Women play a central role in both agriculture and nutrition but are often underserved by agricultural information systems. The pathway from women's empowerment to nutrition includes steps for women's time use and energy expenditure because work in agriculture is time and labor intensive (Strengthening

⁶ The Global Environmental Management Support Project (GEMS) provides sector-specific environmental guidance to support activity design, pre-implementation environmental review, and development of environmental mitigation and monitoring plans (EMMPs).

Partnerships, Results, and Innovations in Nutrition Globally 2014). Working at a high level of physical intensity may leave women unable to meet the physical demands of pregnancy and lactation, to the detriment of birth and nutrition outcomes (Herforth, Jones, and Pinstup-Andersen 2012). Agricultural activities can contribute to improved nutrition when supporting both caregiving responsibilities and women's income-generating opportunities such as for investment in labor-saving technologies (especially for pregnant and lactating women). Technologies that will save time for both men and women while promoting a more equitable division of caregiving (U.S. Agency for International Development, forthcoming). Although access to public agricultural extension services is low overall, women farmers receive fewer agricultural extension services from MOFA than men, in part because most extension agents are men (World Bank 2010; McNamara et al. 2014). Furthermore, women do not have equal access to or control over resources, such as mobile phones, which have become important as platforms and technologies for receiving agricultural information (Pew Research Center 2015; GSMA 2015). Digital ICTs can enhance the decision-making power of women and girls by providing new information, learning opportunities, and technical and practical skills (Cummings and O'Neil 2015).

Our assessment found that agriculture activities and stakeholders (typically NGOs) that specifically aim to improve nutrition are more likely to target women with nutrition-sensitive agricultural information and services. Within contract farming schemes, most nucleus farmers in Ghana are men. However, 45 percent of outgrowers reached by ADVANCE are women, reflecting women's historical role as outgrowers rather than targeting by specific projects (Agricultural Development and Value Chain Enhancement Project 2015). Activities such as ADVANCE and GROW provide entrepreneurship and leadership training to break down barriers preventing women from growing their agriculture businesses.

We found that little content directly addressed the role of women in agriculture or gender norms and other barriers to women's economic empowerment. Most stakeholders focused gender-related efforts on women's time and labor, promoting improved technology; we found no messages related to how women can reduce time and labor spent working or how time saved can be used to contribute positively to nutrition, such as by encouraging male farmers to support their wives to rest more during pregnancy. Further, women were not specifically targeted by the ICT platforms reviewed. ICT service providers all collect gender-disaggregated data but employed no specific strategies to increase access to ICT services for women except when part of a partnering NGO's targeting strategy.

Stakeholders use agricultural information systems to promote a range of technologies with the potential to boost efficiency in farming, banking, accessing information, and workload sharing and thus to reduce the time and energy needed for farming, for both women and men. Technologies such as mechanized planters can save women not just hours but whole days of work. Mobile services, such as mobile money and cashless banking, can minimize travel time for women, and spare them time and

effort, among other benefits for their empowerment (Klapper 2015).⁷ Examples of agricultural information targeted towards reducing the burden on women's time include:

- Messages promoting mechanized farm equipment, such as rippers, no-till planters, fertilizer applicators, and threshers, also show how to save time and energy, especially for women. Equipment manufacturers, such as National Agro Industries and Agromite Limited, advertise this equipment at exhibitions and partner with NGOs and financial institutions to facilitate access to equipment loans in outgrower networks (Box 6).
- Africa RISING (Africa research in intensification for the next generation), ATT, ADVANCE, AGRA, and CARE promote conservation agriculture approaches such as minimum tillage, mulching, and the use of cover crops and crop residues that can reduce time and energy spent on weeding, ploughing, and maintenance. These approaches are encouraged either by lead farmers or by FFSs, depending on the activity.
- FFSs, such as those run by SPRING/Ghana, promote the use of lower cost equipment, such as planters.

It should be noted that few activities illuminate the connection between an intervention and information on how efficiencies in time and energy use that intervention might offer could potentially contribute to improved nutrition for women, children, and men. This study has found no published evidence that spending less time on agricultural tasks has resulted in greater attention to care at the household level, especially in the first 1,000 days. This critical area requires further research and evidence to identify how the additional time brought about by efficiencies is used.

Content on the Use of Income

One of the primary goals of agricultural stakeholders is to increase their agricultural income. SPRING observed stakeholders using agricultural information systems to promote income generation. Increased agricultural income can promote improved nutrition when that income is used appropriately—for example, to ensure healthy, diverse diets, or to pay for health, water, sanitation, or hygiene services. Box 7 and the

Box 6. USAID's Agricultural Technology Transfer Project

ATT, implemented by the International Fertilizer Development Center (IFDC), facilitates access to improved technologies, especially for women farmers. These technologies include multicrop planters and fertilizer applicators for urea deep placement, which can reduce the time and labor involved in planting and fertilizer application (International Fertilizer Development Center Ghana 2015). These technologies have been developed and validated in partnership with MOFA and SARI and are disseminated through outgrower business networks, equipment manufacturers, and financial service providers. ATT partners with ADVANCE, SPRING/Ghana, GROW, and others to achieve greater reach. ATT also uses ICT channels, including video productions with video vans, radio, print, and TV media.

⁷ Research shows that digital finance also has other benefits for women's empowerment, such as increased access and control over resources, decision making, confidence, participation, and security (Klapper 2015).

following examples illustrate how stakeholders in northern Ghana are using information systems to promote messages and practices on use of income for both food and nonfood expenditures that can improve nutritional outcomes:

- FAO incorporates household budgeting, inclusive of costs related to nutrition, in its FFS materials, targeting economically vulnerable smallholder farmers.
- As part of a program with CARI that has ended, Savanna Farmers Marketing Company provided training to its outgrower business networks that included the message “manage money to buy food,” which was promoted along with other messages and training on which foods to grow and consume to improve the nutrition of all household members.
- Catholic Relief Services, RING, and CARE help create savings and lending groups and livelihood groups focused on income generation as platforms to promote nutrition training and the use of income to purchase nutritious foods. There is evidence that many saving groups sustain post-programmatic support, which may be facilitated by the supporting agency, although a given group’s emphasis may change, depending on the interests of its members, after program funding ends (CARE USA 2010).
- GROW partners with the USAID Soybean Innovation Lab to use training materials that build demand for soybean processing among both nucleus farmers and outgrowers and to encourage farmers to reinvest their income in diverse vegetable production and marketing.
- LEAP 1000 (Livelihood Empowerment Against Poverty), an intervention targeting economically vulnerable pregnant women and mothers of children under two within targeted districts, demonstrates the potential to provide messaging to these groups on the use of cash to benefit nutritional outcomes. LEAP 1000 is an expansion of the GoG’s LEAP social protection agenda, whose targeting criteria have expanded to embrace vulnerable 1,000-day households.

Box 7. SINAPI

Sinapi Aba Savings and Loans Limited is a microfinance institution that provides one example of how a financial institution can embed nutrition-related messages within its services to outgrower businesses and other farmer groups. In addition to its core business of loan servicing, Sinapi provides training on women's empowerment inclusive of financial management. It also promotes health-seeking behaviors for women, by providing training on malaria awareness in irrigated fields and how to access health care. Sinapi also requires that all borrowers are enrolled in health insurance.

Although the preceding examples highlight how information systems are used to promote use of income, the scale is still small. At present, content that focuses on increasing income often makes no mention of how to use that income.

Opportunities and Implications for Programming

The findings illustrate that although a few efforts are being made to strengthen the inclusion of nutrition within agricultural information systems, activities are poorly coordinated and opportunities to strengthen the content and delivery of this information remain. Initiatives are poorly linked to the national nutrition agenda, although it should serve as resource for message development. Rather than create new systems for nutrition-sensitive agricultural information, stakeholders in Ghana have the opportunity to build on existing information systems to reach additional people, to improve access equity, and to promote a broader range of nutrition-sensitive agriculture content. This section explores several of the gaps and opportunities identified from discussions with stakeholders in Ghana. For each section, we have included basic principles and the programming implications to consider in order to enhance and scale up this agenda.

1. Opportunity: Diversity of Actors across the Value Chain Promoting Agricultural Information

Our assessment identified a variety of actors at different stages of the value chain who are involved in agricultural information systems in Ghana. Sustainability is one of the primary challenges to incorporating nutrition-sensitive messages into agricultural information systems, as current approaches rely primarily on external funding and coordination among many stakeholders.

Most actors who are actively integrating nutrition within agricultural information systems are donor funded and have specific objectives related to nutrition, such as USAID-funded SPRING/Ghana and RING. Many of these activities work directly with government staff and AEAs. Other value chain actors, particularly those from the private sector, are less likely to engage in nutrition-sensitive agriculture. Value chain actors, therefore, represent underutilized potential for promoting nutrition-sensitive agriculture messages and practices. There is a role to emphasize the long-term benefit to private sector business models of a healthier more productive clientele base within the national nutrition frameworks.

Like private sector actors, FBOs are less likely to include nutrition-sensitive messages within their agricultural information systems, a consequence of the absence of profitable models and the (untested) perception that the demand for this information is minimal. Many respondents felt that the demand and ability to provide or pay for nutrition-related information was likely limited, although demand for more traditional agricultural information about weather and prices is consistent. For example, Savanna Farmers Marketing Company indicated that although the training on nutrition education, hygiene, and other agriculture practices provided through CARI was valuable, the company could not afford to continue its services on its own, as it provided no obvious financial return to members. This is not to say that the private sector would not deliver nutrition messages—rather that there is a need to reduce the transaction costs of doing so, perhaps through public subsidy. Nonetheless, male FBO members may be an untapped audience for nutrition-sensitive agriculture messaging and could serve as an information conduit to the household.

Government actors face additional challenges. A recent assessment of extension services in Ghana noted that MOFA is working in a resource-constrained environment and depends on NGO assistance to reach farmers with agriculture extension services (McNamara et al. 2014). This was reiterated during interviews with MOFA, AES, and WIAD, and with NGO actors. With limited capacity to deliver basic agricultural information, integrating nutrition information and adapting content to be more nutrition-sensitive will be challenging without significant additional human, technological, and financial support.

Our review found very little coordination around agricultural information systems and nutrition-sensitive agriculture within Ghana. For example, multiple government-based services are promoting similar WASH and hygiene messages, but all content is developed independently. Similarly, multiple agencies are developing messages around aflatoxin and mycotoxin control, and these could theoretically be coordinated and promoted consistently across and among farmers. At the same time, we found little coordination of content development between agriculture, health, and WASH sectors, despite the interrelationships, although Feed the Future partners in Ghana are making significant efforts to coordinate content and program engagement. (For instance, SPRING/Ghana is expanding into the promotion of biofortified crops through support from RING's success with OFSP and extension services on orange maize production and through seed production support from ATT.) Chiefs of parties for Feed the Future-funded activities meet regularly to share activity updates and discuss further collaboration.

This presents the opportunity to develop an oversight committee with Feed the Future USAID partners committed to sharing and consolidating. Such a committee could work with the proposed 'one-stop information shop' under the government to coordinate messaging. However, without leadership or willingness from the GoG to take on and institutionalize this agenda, government efforts will remain fragmented.

Programmatic Implications

Nutrition and agriculture linkages are being driven largely by donor-funded activities, implemented through NGOs, or through government extension services with NGO support. More effort is needed to engage actors who have been less involved in nutrition, especially private sector actors. Programs could utilize platforms such as outgrower business networks and financial services to incorporate nutrition within information systems. This would take the information to a larger population and to potentially insert nutrition information at multiple points within and along value chains.

A sustainable business model is needed for private sector actors to incorporate nutrition into their extension activities with a vision of a healthier, more productive farm clientele. One way to address this vision may be to integrate nutrition-sensitive agriculture messages into other, more demand-driven content. For example, information on weather could include simple messages, such as, "Now would be a good time to plant [specific nutrient-dense crops], which provide excellent nutrition for young children." Or, "As rains are expected over the coming weeks, don't forget to discard any standing water around your farm and homestead, as mosquitoes that can carry malaria may breed there."

2. Opportunity: Strong, Accepted Platforms and Content Exist for Agricultural and Nutritional Information

A variety of platforms that use both interpersonal and mass media communications channels to reach farmers and value chain actors already exist in Ghana. Most platforms already include traditional agricultural information on topics such as crop production, post-harvest processing, new technologies, weather, and market prices. Most actors, whether government, NGO, private sector, or ICT provider, are using GAPs as a basis for agricultural information and extension programming. However, a wide range of supplementary content on topics such as nutrition, hygiene, household budgeting, food preparation, and promotion of financial services has been incorporated in many of the platforms observed.

One of the primary challenges mentioned around integrating nutrition with agricultural information was the development of content that would be useful and valued by recipients.

Enhancing the technical content and messaging to promote linkages between GAPs and nutritional outcomes can potentially have a profound impact on making agricultural information systems more nutrition-sensitive. Nutrition-related messages linked to these practices could be embedded or linked within existing technical content used by extension agents, other value chain actors, and ICT services. We found two opportunities for strengthening agricultural content to better contribute to improved nutrition that would reduce the need to develop whole new content areas:

1. Conduct a review of existing messages and content, identifying areas that could be made more nutrition-sensitive. In addition, review content to ensure that messages do not inadvertently lead to adverse effects on nutrition or on women's time, labor, or bargaining power. Assess this according to specific target groups and disaggregate by gender. Utilizing a joint platform through SUN mechanisms would be most effective to ensure multi-sectoral engagement by ministries, although it would also need to be replicated by NaNuPaCC and the regional coordination mechanism to ensure effective buy-in.
2. Include additional, targeted content on nutrition-specific topics linked to existing agricultural content. For example, activities focusing on increasing household incomes could include messages around the importance of purchasing a diversity of nutritious foods to ensure a balanced diet to meet the nutritional needs of various household members. Based on context, this must be linked to efforts to influence market actors to make those foods more available in the market and to adopt technology and management practices that will lower the cost of nutrient-rich foods for vulnerable households. Awareness of the actors who are involved in producing more nutrient-dense foods needs to grow and be linked to the Feed the Future partners in northern Ghana. Many practices, such as reducing post-harvest losses, are promoted on a large scale through outgrower business networks. The integration of nutrition-related messages into these networks therefore represents untapped potential for reaching a large number of farmers and value chain actors as post-harvest management maintains quality as well as quantity and thus food safety.

Apart from the standard GAPs content, a range of WASH, water, and environmental management-related information that is inherently nutrition-sensitive is being shared. This information has strong potential to contribute to better nutrition but has not been expressly linked with nutrition in Northern Ghana.

Further, the platforms explored in this review were not providing information around improved household caring and healthcare practices. This type of nutrition-sensitive content contributes to better nutrition and could be integrated into agricultural content, particularly in activities that aim to strengthen women's empowerment or improve household incomes. It also supports achieving the 1,000-day household promoted by SPRING and other, where nutritious foods are part of diverse diet and there is a clean household environment to nurture children during their first 1,000 days.

Programmatic Implications

Further context analysis and formative research related to cropping systems and value chains in Northern Ghana is needed to determine the nutrition-sensitive messages appropriate for each platform. Nutrition-sensitive agriculture practices are context-specific, and it is important to develop and test which messages make sense to farmers and value chain actors within their contexts. Practices and messages are not all the same.

With the broad promotion of GAPs in new technologies, training, and input supply systems, there is an opportunity to use messages promoting GAPs for integrating nutrition on a larger scale. Many examples of agricultural content require only small adaptations to make them more nutrition-sensitive (Table 1). GAPs that can be adopted with the least disruption to traditional practices have the greatest chance of being readily accepted by farmers.

GAPs related to a clean and safe environment, such as safe management of farm inputs, environmental management, reduction of post-harvest loss, and food safety also stand out as priority practices for promoting nutrition-sensitive agriculture; many of them are inherently nutrition-sensitive and currently promoted within agricultural information systems. Although additional context analysis is still needed, existing technical content and dissemination approaches that link agricultural practices with environmental safety, human safety, and hygiene present an entry point.

Starting with cropping systems and value chains where nutrition-sensitive agriculture practices inherently exist, such as those promoted within conservation agriculture (e.g., ADVANCE, AGRA, and ATT) will help farmers and other actors more easily understand the association between agricultural practices and nutrition.

Table 1. Opportunities for Making Agriculture Content More Nutrition-Sensitive

Current agriculture content or practice	Associated nutrition-sensitive content
Promotion of improved planters and fertilizer applicators among women rice and groundnut farmers	Promote giving pregnant and lactating women time and space to take regular breaks during work to ensure optimal nutrition for themselves and children
Organization of financial service providers to partner with equipment manufacturers and NGOs to increase financing for equipment	Advertise loans for women to access labor-saving equipment and associate it with benefits to nutrition
Trainings provided on access to finance, household budgeting, and women's entrepreneurship	Promote joint decision making on the use of income for food, caring, and health-seeking behaviors
Encouragement for marketing practices: Labelling of quality inputs and advertising through market actors can increase awareness of improved varieties and can link buyers and sellers	Market nutritional value and use of crops and foods to influence better nutritional choices
Pursuit of integrated pest management and safe management of pesticides and fertilizers; use of protective gear to safeguard health	Promote product safety warnings, such as to advise women and children from being in an area when there is spraying
Messages provided around improving animal health and manure management by instituting livestock corrals and improved feed	Provide messages on enclosing animals and manure, hand washing, and keeping children away so as to help reduce vectors of disease and contamination
Providing weather forecasts	Link weather forecasts to planting and harvesting times for highly nutritious crops to reduce post-harvest issues, such as aflatoxin, to improve crop quality, quantity, and, hence, food safety
Providing price information	Provide information on premiums for aflatoxin-safe produce to drive behavior change to adopt critical food safety practices

3. Opportunity: Targeted Efforts to Reach Women May Reduce the Information-Access Gender Gap

Access to information can enable women engaged in agricultural livelihoods to make positive decisions for nutrition. Evidence shows that women's discretionary income has a greater impact on child nutrition and food security than men's (Smith et al. 2003; UNICEF 2011), yet women face gender-related challenges in extension services and information about new technologies (McFarlane 2016). In Ghana, only about 20 percent of public extension services reach women farmers (Ministry of Food and Agriculture 2007). Most extension agents and input suppliers are men, and cultural norms discourage interactions between female and nonrelated males (McFarlane 2016). In addition, there are cultural barriers for women to become nucleus farmers, although such activities as GROW and ADVANCE have begun to target more women directly as nucleus farmers. As funding allows, WIAD supports specific activities in districts that target women, often with demonstrations on crop utilization for nutrition. NGOs have had more success supporting women in agricultural activities, through structured engagement with community leadership, such as dialogue, trainings, and development of male gender

champions to provide the social space for women to be supported. At the same time, however, these efforts are limited.

One key strategy in improving nutrition through greater women's empowerment is to promote time- and labor-saving practices and technologies in farming, finance, and livelihoods, while encouraging an equitable division of responsibilities for household labor among men and women. This is especially important for pregnant and lactating women and for mothers of children under two years of age, when these individuals are within the 1,000-day window when childhood stunting can be prevented and when caloric, nutrient, and health care needs are greatest. Reducing the time and energy women spend on agriculture can potentially impact nutrition if women then use that extra time to take better care of themselves and their children and to pursue other health-seeking behaviors.

A number of stakeholders in Ghana promote labor-saving equipment and technologies, and some target these specifically towards women. They represent an opportunity to make agricultural information more nutrition-sensitive, by integrating messages related to how the time harvested from these items can be used to improve family health.

In addition to ensuring appropriate content, there is also a need to improve the ability to speak to women through agricultural information systems, as they are less likely to be reached by agriculture extension services and mobile platforms. This need highlights the need for strong multi-sectoral collaboration on the generation and delivery of content, as women also learn about nutrition, care, and health-seeking practices through other health and community information channels. Social norms still dictate access to information and control of resources, and programs that address social structures as well as technical matters are likely to be more successful in reaching and engaging women. WIAD and AEAs are also critical for promoting messages among women and men in all types of farmer groups. WIAD works to support AEAs but is resource-constrained, so as to need to rely on donor-funded projects and to focus on contributing to donor project agendas.

Programmatic Implications

As women are critical in efforts to improve both nutrition and agriculture, agricultural information systems in Ghana must make greater efforts to bridge the information gap between women and men, while simultaneously increasing access for all. This will require understanding and addressing the barriers that prevent women from accessing information and developing coordinated information strategies that are more likely to reach women. For example, other activities that may already target women directly, such as savings and loans associations, can be enhanced to include nutrition-sensitive agriculture messaging.

Formative research is needed to determine how agricultural information systems can be used to influence how women spend their time and energy and to reinforce care- and health-seeking behaviors, including how this research can be used to create messages that promote nutrition-sensitive agriculture practices related to time and energy use by women across agriculture working environments (i.e., in the field, at home, on the job, or in markets). A simple barrier analysis can assist in shaping this agenda.

Many women may already be reached with nutritional content from other platforms, but there is little coordination among the different sectors in Ghana on the development and delivery of nutrition-related content. Coordination needs to be strengthened, particularly between WIAD and GHS. It is essential that all nutrition programs receive endorsement from these line ministries and work with the multi-sectoral platforms operated under the NNP.

Finally, although targeting messages to women is critical, it is also important to address men and others who influence how women spend their time and energy because they impact women's ability to access and use technology and to practice care- and health-seeking behaviors to benefit themselves and their children. Including men in these messages enables them, too, to be informed and engaged about nutrition.

4. Opportunity: Value Chain Actors Are Well Placed to Promote Content Related to the Use of Agricultural Income

Existing agricultural information systems in Ghana directly reach several hundred thousand farmers with the aim of increasing agricultural income. However, only rarely do these systems include information that address how that income is used. It is even less likely that information is provided promoting the use of income for expenditures that would lead to better nutritional outcomes, such as purchasing nutrient-rich foods or saving for future healthcare needs. Our review found only a few activities advocating the use of income for nutrition, for paying for better diets (either generally or by promoting specific foods), or for equipment to help process and store foods. We found no examples of activities or platforms that promoted the use of income for nonfood expenditures that contribute to better nutrition, such as accessing health care or child care.

Within Ghana, a number of financial service providers and private sector actors are involved in agricultural information systems. These actors present a natural entry point for strengthening information on the use of agricultural income for nutrition. Within this context, many opportunities exist for creative content development using extension agents and ICT, marketing strategies, or development of business models to incentivize investment. Although few financial service providers in Ghana include nutrition-sensitive information, the example of Sinapi Aba Savings and Loans (Box 7) shows that innovative approaches make it possible to include information to strengthen nutrition by a value chain approach.

VSLAs form another potential channel. These associations can be particularly effective in reaching women and are strong platforms on which to build an activity, although it is important to wait until they are well formed. CARE found that a VSLA must have been formed and active for at least a year before the linking of any additional activities to the group. Although VSLAs have primarily targeted women, many have grown to include men as well.

Programmatic Implications

Increased income does not necessarily translate to better household nutrition. Deliberate, sustained efforts to encourage the use of income for purchases that will contribute to better nutrition is

necessary, and it will take time before the effects will be seen. Greater efforts should be placed on using communication platforms through outgrower businesses and value chain actors in northern Ghana to promote messages on the use of income for nutrition. Additionally, value chain actors, such as financial service providers and input suppliers, can facilitate access to market services and products that promote positive nutritional choices. However, additional market research is needed to explore strategies that would motivate these actors, who are less likely to engage in nutrition promotion, to include content promoting the use of income for improved nutrition.

Existing materials used in livelihood and nutrition programs can be enhanced to promote use of increased income for nutrition, such as nutrition education related to purchasing and growing better food for a balanced diet, as well as household budgeting. These materials must also consider the role of gender in household decisions around the use of income and must promote greater levels of joint decision making between men and women. Additional content development is also needed to promote nonfood expenditures that contribute to better nutrition, better health, or investments in improved WASH.

5. Opportunity: Growing ICT Platforms Can Reinforce Information Provided by Other Mechanisms

ICT represents a significant opportunity to promote creative nutrition-sensitive agriculture solutions. Our assessment found that, despite the expansion of such ICT platforms as mobile, radio, video, and tablets, despite the opportunities they have created to disseminate information on a wide variety of topics, there is relatively little content within ICT services on nutrition-sensitive agriculture, compared to mainstream agriculture messages and health messages. Health implementers do provide some nutrition-specific content, primarily focused on pregnancy, but there is a great deal of agricultural content in which nutrition-related messages can be embedded.

In a systematic literature review of effective communication approaches for social and behavior change (SBC)—broadly categorized as interpersonal communication, use of media, and community/social mobilization—SPRING found that using multiple SBC approaches and channels of communication is more effective in promoting high-impact nutrition behaviors than using just one. In addition, the frequency with which people receive these messages influences how likely they are to take up the information and act on it (Lamstein et al. 2014). Interpersonal communication approaches, such as farmer-to-farmer support, allow for deeper engagement and more detail and provide the recipient of the information with the opportunity to ask questions and to better interact with the ideas presented. Mass media approaches permit more frequent communication and layering of multiple, complementary messages over time. Using these two approaches together provides the greatest opportunity to reinforce learning. Where resources are limited, it may be best to invest in strengthening interpersonal approaches, as a mass media approach alone cannot replace the rich content provided in person in trainings, demonstrations, and peer-to-peer interactions. Further, peer engagement is an excellent way to identify which messages are suitable for mass communication.

The ICT-based agricultural information systems we identified are primarily used to complement other community-based, interpersonal approaches. The ICT providers we found have also developed strategies for conducting more direct outreach, partnering with existing activities and other stakeholders in Ghana. For example, Farmerline hires its own private extension agents, who work in collaboration with MOFA agents in order to build confidence in its mobile and online services. Esoko and Farmerline use call centers that permit farmers to talk with trained service providers, while also generating feedback data on the types of questions and answers that are most relevant in the locality. Recognizing that nutrition messaging is not income generating, many opportunities noted relate to the ability to develop new content and to integrate nutrition-sensitive agricultural content into ICT platforms at scale.

Lastly, new initiatives and implementation research conducted through the ICT for Extension Challenge fund and other global mechanisms all seek to address issues related to access, content, and effectiveness of various mediums. More can be done in Ghana to gauge the willingness to pay for ICT content and to test its design and approaches for integrating nutrition-related content.

Programmatic Implications

ICT should be used to promote existing nutrition-sensitive agriculture practices, such as use of production and post-harvest handling and storage practices that minimize aflatoxin in maize and groundnuts. Such practices can serve as building blocks to disseminating additional messages that promote other nutrition-sensitive agriculture practices, including those linked to how women use their time and energy.

The Principles for Digital Development are living guidelines that can help development practitioners integrate established best practices into technology-enabled programs. Established through a consultative process with international donors, multilateral organizations, and implementing partners, such principles may help overcome the challenges and barriers related to access and utilization of ICT services discussed with respondents, such as literacy, cost, scalability, and access to technology (Waugaman 2016). These topics are relevant in designing affordable products and services that can be designed to reach more women. Strategies that assist ICT providers and mobile operators increase access to technology, especially for women, can help contribute to women's empowerment and nutrition.

Lastly, as communications platforms become more accessible, ICT service providers such as Farm Radio are using mobile technologies to conduct surveys and polling during radio talk shows, which allows for rapid feedback. Such an interactive use of technology is useful in increasing citizen participation, gauging knowledge and interest, and promoting nutrition-sensitive agricultural information. These have recently been utilized in health communication strategies in Ghana, such as Communicate for Health (although some recipients are weary of receiving mass text messages and Vodafone has ceased its push messaging to those who have not registered).

Next Steps

Taking into account the findings and opportunities described above as well as a thorough understanding of GoG frameworks and policies, SPRING recommends that USAID/Ghana consider taking the following actions to further strengthen the integration of nutrition within agricultural information systems in northern Ghana:

1. **Identify one or two existing activities to serve as potential pilots, and find opportunities to expand the nutrition-sensitive content of agricultural information platforms that are already being used.** For example, ADVANCE's involvement with a range of platforms, target groups, and activities could provide many opportunities to strengthen nutrition integration. Within each selected activity, a careful review could identify all types of content currently provided, and mapping it against the SPRING agriculture-to-nutrition pathways could identify content to make more nutrition-sensitive. The review might also help identify nutrition-specific topics and messages that are complementary to existing content and that are tailored to target groups' different information needs. We suggest conducting this review and focusing initially on one activity that utilizes farmer-to-farmer approaches and one activity that works primarily through ICT platforms. To enhance the review, it would be useful to seek positive case studies from other Feed the Future countries.
2. **Conduct formative research, informed by best practices in SBC programming.** Developing appropriate, effective behavior change messages and identifying appropriate platforms requires high-quality formative research. We recommend that formative research be used to shed light on a number of questions:
 - a. What nutrition-sensitive practices already exist in the community? Which ones can be scaled up?
 - b. What practices would farmers and other value chain actors be willing to try?
 - c. What barriers exist to adopting these behaviors? Do barriers vary from group to group (for example, between men and women)?
 - d. What target groups should be prioritized? How might it be possible to ensure equal access to information by women and men?
 - e. What are the most appropriate platforms for different types of messages?
 - f. What nutrition-sensitive messages work at which stage of the value chain?⁸
3. **Strengthen partner and staff capacity around SBC.** Most agricultural information systems aim to influence behaviors or practices—for example, by promoting improved agricultural production techniques focused on increased yield and income. Applying a nutrition-sensitive

⁸ SPRING is currently developing a methodology for assessing opportunities for nutrition integration along the value chain.

SBC lens to agricultural information systems can improve the effectiveness of this information. However, many agricultural activity staff members are unfamiliar with SBC principles. Several resources can help activity managers better understand and implement SBC approaches, including the [Designing for Behavior Change](#) curriculum and an online training on social and behavior change for nutrition-sensitive agriculture, which SPRING will be releasing in 2017.

4. **Conduct training for government staff members and implementing partners.** Informing them about nutrition-sensitive agriculture approaches will help in setting the foundation for more traditional value chain programs to embrace the nutrition-sensitive agenda.
5. **Strengthen stakeholder coordination mechanisms.** Consider all stakeholders involved in agricultural information systems and nutrition in Ghana, preferably those under the direction of MOFA. The training mentioned above would be a first step. Utilizing existing platforms for multi-sectoral coordination such as the SUN platform would also be useful. USAID/Ghana might consider supporting this coordination within the ZOI, bringing together the agricultural coordination body for northern Ghana and the Northern Region Nutrition Coordinating Committee to discuss this report and to define specific steps for improving coordination of content, platforms, and actors. SPRING has a wealth of experience in facilitating multi-sectoral coordination and collaboration strategies for nutrition with USAID Missions and would be happy to share reports and experiences.
6. **Expand efforts to reach women with nutrition-sensitive agriculture.** Reach large numbers of women through such platforms as VSLAs. Based on formative research, USAID could develop a detailed communication agenda.
7. **Explore where incentives exist for the private sector to provide technical input into message creation and delivery.** A core function analysis is needed to identify what information is delivered by the private sector, what could be delivered with small a subsidy or reduction in transaction costs, and what important information will fall to the public sector (either directly through public extension services or through delivery contracted by private mechanisms). Private sector actions have the potential to help remove a major constraint, the limited capacity of public extension services, and could potentially increase the number of farmers accessing extension services.
8. **Define parameters with the government.** Consider how messages are developed, which messages are targeted to which groups, who is identified to develop, approve, review, and validate messages, and the process for approval, review, and validation. Guiding principles or a code of practice for message development to link agriculture and nutrition would be a critical component to this effort. The crux of the GoG's success in nutrition-sensitive agriculture message development and delivery depends on its ability to strengthen the public extension system. MEAS recommendations include: systematized monitoring and evaluation; action research on extension and best-fit approaches for Ghana; and incentives and rewards to extension agents for performing extension duties (McNamara et al. 2014).

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Annex 1. Interview Guide

Introduction

1. Provide an overview SPRING and to the Ag-Nut team's work on the pathways.
2. Review the objective of the landscape study.
3. Connect study to interviewee using categories of nutrition-sensitive agriculture practices (Annex 2, "Nutrition-Sensitive Agriculture Practices Framework").

Key Overarching Questions:

1. General program overview

- a. Can you please tell us a bit about your programs or business in Ghana, especially in Northern Region?
- b. Do you have programs that are focused on nutrition or that link to nutrition?
- c. Do you have program activities that also touch on the nutrition-sensitive agriculture categories of practice we've described?

2. Stakeholders

- d. Who are the key public, private, and civil society stakeholders providing agricultural information services in Ghana, especially Northern Region, that are the most relevant to the USAID/Ghana program portfolio? (We will be interviewing stakeholders serving Northern Region, but will also interview others *if* they offer a relevant service elsewhere.) What roles do they play? What mechanisms do they use and who are they targeting?
- e. Who are the key public, private, and civil society stakeholders from other sectors providing services and information that influence agriculture services? (These may include WASH, nutrition, health, and gender).
- f. Based on the categories of practice, which stakeholders are likely to be providing information and services that could potentially be nutrition-sensitive?

3. Information and technical content provided through related services or mechanisms

- g. To what extent do the information and related services that are promoted for agriculture (i.e., agricultural information systems), fall into the categories of nutrition-sensitive agriculture?
 - i. What content is promoted through existing agricultural information systems and services?
 - ii. To what extent could this content be considered nutrition-sensitive?
 - iii. To what extent is this content linked to a specific agriculture policy, strategy, or activity? What about a specific health, nutrition, or WASH policy, strategy, or activity?

- iv. Who generates the content, and what are the parameters that govern it (e.g., is it regulated content, proprietary, open access, or project driven?)?
- v. Where does the information go once generated? Is dissemination demand driven or project driven? Does it dead-end?
- h. Referring to the categories of nutrition-sensitive practices, to what extent can the range of services and the related information offered be considered nutrition-sensitive?
 - i. Is content covering nutrition education produced or provided through the program? If yes, how?
 - ii. Do food-based strategies include a nutrient-dense crop, such as soy? Are other cropping strategies used to promote nutrient-dense and diverse foods?
 - iii. Are the linkages to human nutrition promoted through the information systems linked to improved cropping technologies, soy bean production and marketing, or other diverse foods? If yes, how?
 - iv. Are linkages made between improved soil fertility, sustainable intensification, and nutrition? If yes, how is this promoted through the information systems?
 - v. What are the activities that can impact a clean and sanitary environment, such as water resource management activities, livestock management, and storage and use of pesticides, fertilizers, compost, and other potentially hazardous products? What information and training content is promoted with these activities?
 - vi. What are some of the women's empowerment strategies, and do they include information and outcomes, or link to data that can be considered nutrition-sensitive? For example:
 - 1. What economic empowerment strategies are promoted?
 - 2. What measures, if any, are taken in the project to help women manage child care while working on farm or off farm?
 - 3. Does the project include strategies and information to address equitable workload, labor constraints, or labor efficiency, especially for women?
 - 4. Does the project include strategies to help women allocate time and energy for household members and for women to care for themselves and children?

4. Access and communication platforms

- i. How do farmers and households access agriculture AND nutrition-sensitive agricultural information services and related content?
 - i. How are target groups accessing information promoted through USAID, other donor programs, and other private initiatives?

- ii. To what extent do civil society groups also serve as information dissemination platforms (e.g., savings groups, farmer groups, women's groups)?
- iii. To what extent do public institutions and decentralized structures also serve as information dissemination platforms for agricultural information? Do they also provide services that could be considered nutrition-sensitive (e.g., Ministry of Agriculture, MOFA, Ministry of Health, Ministry of Education)?
- iv. What are the private communications mechanisms and services used to facilitate access to the different types of agricultural information and nutrition-sensitive agricultural information?
- v. What information, communication, and technology approaches are you using to strengthen agricultural information systems? Who are the main actors? Who are the target groups reached? What are some of the challenges and successes? How do you see the future?
- vi. What kind of financial services are strengthened through the project? To what extent are financial service providers and platforms used to communicate information? This might include non-transaction messages, tips in digital services, or information related to promoting specific financial products. What types of messages and related services could also be considered nutrition-sensitive?
- j. What are the considerations for integrating nutrition-sensitive agricultural information into existing mechanisms? What are some additional considerations for integrating nutrition-sensitive agricultural information into existing mechanisms (e.g., feasibility, cost, sustainability, demand, how it might be perceived and understood)?
- k. What are some examples of successful business models that are being tested and scaled, such as social enterprises and public-private partnerships? What are some examples of success models? Are they viable, meaning are they profitable or projected to be profitable and sustainable? What are some of the challenges, especially in Northern Region?
- l. What opportunities do you see for integrating types of nutrition-sensitive agricultural information into existing mechanisms? How would you prioritize these opportunities?

5. Intermediary and end use of information

- m. Based on documented information and perceptions from intermediary agricultural information system stakeholders, how are farm households and food systems actors able to use agriculture and nutrition-sensitive agricultural information?
 - i. Which population segments are reached by the service provider or other stakeholder, through each communication mechanism and type of service provided?
 - ii. According to service providers and reports, if available, what key agriculture services and information are in greatest demand?

- iii. Do private service providers see a demand for the range of information related to nutrition-sensitive agriculture practices discussed in the key categories shared? Which categories of practice?
- iv. What do project records or business sales records show in terms up uptake of practices or purchases of products and services related to the information promoted?
- v. What do marketing and consumer reports indicate in terms of expenditures on nutrition-sensitive practices? Does this data exist?

6. Where do you see the greatest research and development priorities with regards to the categories of nutrition-sensitive agriculture we've discussed in Northern Region?

7. Can you share and recommend further documents we should reference or people we should contact in Ghana or elsewhere?

Annex 2. Nutrition-Sensitive Agriculture Practices Framework

The categories of nutrition-sensitive agriculture practices below represent types of agriculture practices commonly promoted through agricultural livelihood and value chain programs. The categories interact—so, for example, different aspects of food, agriculture production, and marketing strategies may be found in several categories. However, the approach does provide a lens for identifying practices and types of information that contribute to food, health, and care, which are the underlying causes of malnutrition and are found along the production, income, and women’s empowerment pathways to improving nutrition through agriculture (Herforth and Harris 2014). The related illustrative practices provide examples. The actual nutrition-sensitive agriculture practices and related messages will vary depending on the context.

Nutrition-sensitive agriculture category	Related illustrative practice
Food and agriculture production and marketing strategies	<ul style="list-style-type: none"> Promoting nutrient-rich crops and value chains to meet micronutrient and protein needs. Promotion of GAPs as defined by the FAO to positively impact on-farm and post-production processes and their contribution to nutrition (United Nations Food and Agriculture Organization 2003). Strengthening of climate-smart agriculture practices and value chain investments that also contribute to nutrition through availability, quality, and diversity of food and income. Promotion of better decision making in what foods are planted for consumption and sale through nutrition education among consumers and other value chain actors.
Strategies that promote a clean and healthy environment	<ul style="list-style-type: none"> Post-harvest handling and storage practices that include food safety and quality and reduce loss. Soil and water resource management practices that mitigate exposure to contaminants, especially for children. Livestock management practices that enable separation of animals and mitigate exposure to fecal–oral contamination.
Strategies that promote an enabling environment for households, and especially women, to save time and energy	<ul style="list-style-type: none"> Developing approaches for child care around cultivated perimeters and other work venues so that women can increase economic empowerment, practice the ENA, and protect children from contaminants. Improved farm technologies, such as mechanized planters that save women’s time and energy, reducing their caloric expenditure. Developing approaches that promote men’s roles and decision making in equitable labor distribution.

Nutrition-sensitive agriculture category	Related illustrative practice
Strategies that promote how income is used	<ul style="list-style-type: none"> • Engaging market actors in reinvesting in more diverse and nutrient-rich foods. • Promoting household budgeting practices to influence how income is used to pay for nutritious foods, health care, and child care. • Product marketing that promotes income expenditure related to nutrition.
Strategies that promote and enabling policy and service delivery environment for farmer groups as well as private and public sector actors	<ul style="list-style-type: none"> • Policies and practices established by farmer cooperatives to promote regular breaks for women to rest. • Policy advocacy training to increase citizen participation and awareness of food safety standards along value chains. • Policies and strategies that increase access to technology and information for women.

Annex 3. Key Informants

Organization	Title
ACDI/Voca	Deputy Chief of Party (M&E, Learning and Quality Assurance), ADVANCE
Alliance for the Green Revolution in Africa	Country Head, Ghana, Scaling Seeds and Technologies Partnership in Africa (SSTP)
Alliance for the Green Revolution in Africa	Deputy Country Coordinator, SSTP
Alliance for the Green Revolution in Africa	Country Coordinator, SSTP
Agriculture Policy Support Project	Chief of Party
CABI	Plantwise Country Coordinator
CABI	Regional Coordinator
CABI UK	Mobile Programme Executive
Canadian Agriculture and Food Security Program	
CARE	Project Coordinator for Food Security and Climate Resilience
Catholic Relief Services	Head of Programming
Catholic Relief Services, Tamale	Savings and Internal Leading Committees (SILC) /Nutrition Specialist, Integrated Sanitation , Hygiene and Nutrition for Education (I-SHINE) Project
Catholic Relief Services, Tamale	SILC/Nutrition Specialist, I-SHINE Project
Esoko	Enumeration Manager
Esoko	Farmer Helpline Advisor
Esoko	Managing Director
Esoko	Nutrition Specialist
Esoko	Sales Executive
Farm Radio International	Communications Officer
Farm Radio International	Country Director
Farmerline	Director of Business Development
FHI360	Country Director
Financing Ghanaian Agriculture Project (USAID-FinGAP)	Deputy Chief of Party & Manager, Agribusiness Opportunity Development Unit

Organization	Title
United Nations Food and Agriculture Organization	Food Security and Nutrition Officer, FAO Regional Office for Africa
GAIN	Project Manager
GHS	Director of Nutrition
GHS	Nutrition Officer
Global Communities	COP, RING Project
Global Communities	DCOP, RING Project
Global Communities	Livelihoods / Agriculture Coordinator, RING Project
Global Communities	Senior Policy Advisor, RING Project
Grameen Foundation	Country Director
GSMA	Market Engagement Manager, Mobile for Development
Ignatia	
IFDC	Business Oriented Integrated Soil Fertility Management Advisor, ATT
IFDC	Consultant on Climate Smart Agriculture, ATT
IFDC	ODA/Technical Director, ATT
Imagead	CEO/ Systems Designer
International Institute of Tropical Agriculture (IITA)	Country Representative / Chief Scientist, Africa RISING West Africa
Jhpiego	Country Director
JSI	Nutrition Component Manager, RING Project
JSI	USAID DELIVER Project
Mennonite Economic Development Associates	Country Project Manager, Ghana
MOFA, Directorate of Agricultural Extension Services	Deputy Director
MOFA WIAD	Regional WIAD Officer, Northern Region
MOFA WIAD	Deputy Director and Nutrition Lead
Monitoring, Evaluation, and Technical Support Services (METSS)	Acting COP, M&E Team Leader
METSS	KML&C) Team Leader

Organization	Title
NRCC/RPCU	Senior Development Planning Officer
Savanna Farmers Marketing Company (SFMC)	Operations Officer
Savanna Farmers Marketing Company (SFMC)	Operations Officer
Sinapi Aba	Project Coordinator
SPRING/Ghana	Agriculture Advisor
SPRING/Ghana	COP
SPRING/Ghana	DCOP
SPRING/Ghana	Field Coordinator
SPRING/Ghana	Field Coordinator
UNICEF	Communication for Development Specialist
UNICEF	Nutrition Specialist
University of Development Studies, Tamale	Professor
University of Development Studies, Tamale	Professor
USAID/Ghana	Development Outreach and Communication Specialist
USAID/Ghana	Food Security Specialist
USAID/Ghana	Feed the Future Finance Specialist
USAID/Ghana	Monitoring and Evaluation Specialist
USAID/Ghana	Nutrition Program Coordinator
USAID/Ghana	Program Coordinating Specialist
USAID/Ghana Tamale Office	Program Management Specialist for Agriculture
USAID/Ghana Tamale Office	Program Management Specialist for Nutrition
VOTO Mobile	Chief Operations Officer
VOTO Mobile	Regional Director of Programs
WASH for health	BCC Specialist
WFP	Programme Officer
WFP	Programme Officer, Purchase for Progress (P4P)
WFP	Senior Programme Associate



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