

A RAPID ASSESSMENT OF THE DISSEMINATION OF SOIL IMPROVEMENT PRACTICES IN NORTHERN GHANA

Enabling Farmers for Agricultural Transformation (EFAT) Project

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TABLE OF CONTENTS

ACRONYMS	3
EXECUTIVE SUMMARY.....	4
BACKGROUND.....	5
METHODOLOGY	8
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FINDINGS	8
Closed soil improvement initiatives in Upper East and Northeast Regions.....	8
On-going agricultural activities/initiatives in the Upper East and Northeast regions and beneficiary targets	9
ISFM technologies being disseminated	12
ISFM Technology packaging and Dissemination channels	12
Challenges in disseminating ISFM technologies and constraints to adoption	13
CONCLUSION AND RECOMMENDATIONS.....	15
ANNEXES.....	1
<hr/>	
Annex 1. Projects/individuals interviewed for the rapid assessment.....	1

A Rapid Assessment of the Dissemination of Soil Improvement Practices in Northern Ghana

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ACRONYMS

ADSIP	Accelerated Dissemination of Soil Improvement Practices Project
AEA	Agricultural Extension Agent
AGRA	Alliance for a Green Revolution in Africa
CBA	Community based agent
EAS	Extension and Advisory Services
EFAT	Enabling Farmers for Agricultural Transformation
FAO	Food and Agriculture Organization of the United Nations
IFDC	International Fertilizer Development Centre
ISFM	Integrated Soil Fertility Management
MOFA	Ministry of Food and Agriculture
NGO	Non-Governmental Organization
PFJ	Planting for Food and Job
ToT	Training of Trainers
USAID	United States Agency for International Development
VSLA	Village Savings and Loans Associations
WFP	World Food Programme
WISE	Women’s Innovation for Sustainable Enterprises
ZOI	Zone of Influence

EXECUTIVE SUMMARY

Smallholder agriculture systems remain the major contributor to food production in Ghana, accounting for over 80% of the country's total food output. Smallholder farmers are faced with numerous challenges that negatively affect their production and livelihoods. These challenges include limited access to improved technologies, inadequate finance to support the adoption of new technologies, poor marketing opportunities, limited storage capacity, and inadequate transport infrastructures. One significant issue among these challenges is declining soil fertility, worsened by the use of outdated farming practices and insufficient uptake and improper application of improved technologies and methods. This situation has been made worse by several natural and geopolitical events such as the Russian invasion of Ukraine and the COVID-19 pandemic, which disrupted the supply chain of agriculture inputs, including fertilizers that are very essential for soil health/fertility.

Despite smallholder farmers' awareness of integrated soil fertility management (ISFM) and other soil improvement technologies, there is need to improve farmers' access to such technologies and support their adoption for enhanced crop production. The Accelerated Dissemination of Soil Improvement Practices (ADSIP) Project, to be implemented in Northern Ghana by Winrock International under the Enabling Farmers for Agricultural Transformation (EFAT) Project, seeks to accelerate the dissemination of ISFM technologies and practices in Northern Ghana through more effective provision of extension and advisory services (EAS). Northern Ghana is known for having some of the poorest soils in the country and falls under United States Agency for International Development (USAID) Feed the Future (FtF) zone of influence (ZOI).

To plan activities for the ADSIP Project, EFAT undertook a rapid assessment in the Upper East and Northeast Regions to identify ongoing initiatives that promote sustainable soil improvement practices including ISFM. The assessment aimed to identify which ISFM are being disseminated and the extension and advisory methods used, as well as recommend suitable locations for implementation of the ADSIP Project.

During the assessment process, 10 initiatives/projects were identified that are promoting nine key ISFM practices including crop rotation, application of inorganic fertilizer, improved/certified seeds, composting and minimum tillage, among others. Demonstrations, interactive radio and community-based agents (CBA) are among the identified key dissemination approaches used by the initiatives to reach approximately 50,000 farmers in the two regions of study.

Based on the assessment's findings, it is recommended that ADSIP Project focus its interventions on four districts (Builsa South, Talensi, Garu and Bawku West) in the Upper East region. The selection criteria for this region include poverty level, population density and the number of ongoing soil improvement initiatives.

The assessment recommends actions that the ADSIP Project can undertake to address the pertinent constraints of inadequate farmer know-how in applying technologies/practices and limited access to technologies and inputs. One of the key recommendations is strengthening the technical capacity of formal and informal extension providers and organizations (e.g., extension and advisory services

providers such as agrodealers, public sector extension and CBAs) through Training of Trainers (ToT) and the Food and Agriculture Organization of the United Nations (FAO) "soil doctor program" to improve the dissemination of ISFM technologies.

The assessment also revealed several on-going initiatives that ADSIP Project can leverage. For instance, the Alliance for a Green Revolution in Africa (AGRA) partner fertilizer subsidy project (Grow Ghana) being implemented by Yara Ghana presents a great opportunity for technology scale up. Farm Radio International (FRI), along with their partner radio stations, could be instrumental in technology dissemination through interactive radio, while Esoko could support in the use of text messaging. Additionally, other service providers such as Green Ef¹ could be engaged to conduct rapid soil testing to help farmers determine their soil health status and subsequently facilitated to choose the appropriate technologies to adopt.

BACKGROUND

This report presents the findings of a rapid assessment on the dissemination of integrated soil management practices in the northern part of Ghana, an area known for its poor soils, and low crop productivity and high degree of rural poverty. The assessment was commissioned by the Enabling Farmers for Agricultural Transformation (EFAT) Project, implemented by Winrock International, to guide the development of activities for a new initiative entitled Accelerated Dissemination of Soil Improvement Practices (ADSIP). The primary objective of the ADSIP Project is to accelerate the dissemination of the integrated soil fertility management (ISFM) in Northern Ghana through more effective provision of extension and advisory services (EAS) during a 2-year implementation phase (2023-2025).

ISFM is defined as “a set of practices, necessarily involving the use of fertilizers, organic inputs and improved germplasm, combined with knowledge of how to adapt these practices to local conditions, aimed at maximizing the agronomic use efficiency of applied nutrients and improving crop productivity.”²

The rapid assessment had the following objectives:

1. Identify on-going projects and interventions that are promoting ISFM and other soil improvement technologies in Northern Ghana.
2. Identify the types of ISFM practices and technologies being disseminated in Northern Ghana and their various means of dissemination.
3. Identify proven ISFM technologies that the ADSIP Project could promote and take to scale based on any gaps that may be identified.
4. Propose locations where the ADSIP Project could work.

¹ <https://www.greenef.com/green-ef-farming/>

² Vanlauwe et al., (2010). Integrated Soil Fertility Management: Operational definition and consequences for implementation and dissemination. *Outlook on Agriculture* 39:17-24

The rationale for the assessment ultimately seeks to support soil fertility enhancement and boost food crop production in the area, especially considering the poor supply chain of fertilizers caused by the Russian invasion of Ukraine and the COVID-19 pandemic.

Northern Ghana comprises of five administrative regions: Northern Region (Tamale as its capital), Upper West Region (Wa as its capital), Savanna Region (Damongo as the principal town), Upper East Region (Bolgatanga as its capital), and the Northeast Region (Nalerigu as its capital). The region is mostly flat, with an average slope of less than 1%. The vegetation consists predominantly of grassland with sparsely distributed drought-resistant trees such as shea, baobab and acacia. The climate is relatively dry, with a single rainy season that begins in May and ends in October. The amount of rainfall recorded annually varies between 750 mm and 1,050 mm. The dry season lasts from November to April, with peak temperatures in March-April and minimum temperatures in December and January. Poverty is widespread in the region, with northern districts being the poorest in the country. Poverty in northern Ghana is mainly attributed to the area's vulnerability to climate change and precarious climatic conditions, notably a long dry season of about seven months followed by a five-month rainy season with recurrent, intermittent droughts and/or floods in the rainy season.



Figure 1. Map of Ghana showing the assessment

For the rapid assessment of ISFM practices, two administrative regions, Upper East and Northeast, were selected out of the five northern regions (Figure 1).

The Upper East Region is located at Lat. 10°15' and 10°10'N, Long 0° and 1°4'W³. It is bounded on the north by the Republic of Burkina Faso, on the south by the Northern Region and on the east and west by the Republic of Togo and the Upper West Region, respectively. The soils have predominantly light textured surface horizons characterized by sandy loams and loams with very poor organic matter content (1.1-2.5%). The region's soil is "upland soil" mainly developed from granite rocks. It is marked by declining soil fertility and high level of environmental and land degradation (bush fires, fragmented land, deforestation for farming, urbanization, continues cropping and over grazing).

³ <https://mofa.gov.gh/site/directorates/regional-directorates/upper-east-region>

The Northeast Region, carved out of the Northern Region, is one of six regions that were newly created in Ghana in 2018. It covers an area size of 9,072 Km² and shares borders with the Upper East Region on the north, on the east by Togo, on the south by the Northern Region, and on the west by the Upper West Region⁴. It's located at 10°31'N 0°22'W.

Both the Upper East and Northeast Regions are part of USAID's FtF ZOI⁵ and benefit from various interventions covered by FtF activities. The ZOI covers two districts in the Northeast Region (East Mamprusi and Mamprugu-Moagduri) and three districts (Bawku Municipal, Bawku West and Garu-Tempene) in the Upper East Region.

Table 1. Overview of the target regions

Region	Upper East	Northeast
Capital town	Bolgatanga	Nalerigu
Number of districts	15	6
Population (2021 Ghana Population and Housing Census)	1,301,221 (631,263 men/699,963 women) ⁶	658,946 (322,149 men/336,797 female)
Land mass (square meters)	8,842	9,072
Average landholding	1.2 ha	
Major crops grown	Maize, Millet, sorghum, Rice, Cowpea, Soybean, Groundnuts, Vegetables, Onions, tomatoes	
Literacy rate %	46.0 (52 males/33.7 females) ⁷	35.9 (41.3 males/30.9 females)
Inorganic fertilizer usage	12kg/ha	
% Organic Matter	1.1-2.5 ⁸	0.6-2.0
Mobile phone ownership (men/women) %	43.9 (78.7 men/68.7 women) ⁹	37.1 (73men/54.7 women)
Estimated share of female labor in agricultural production (%)	44.1 ¹⁰	64.2
Distance from Tamale to regional capital (km)	152	155

⁴ [https://www.ghanadistricts.com/Home/Region/13#:~:text=North%20East%20Region%20is%20located,\(MDAs\)%20Under%20its%20jurisdiction](https://www.ghanadistricts.com/Home/Region/13#:~:text=North%20East%20Region%20is%20located,(MDAs)%20Under%20its%20jurisdiction)

⁵ The FtF ZOI covers 17 districts in the Northern, Upper East, and Upper West regions of northern Ghana that have high levels of stunting and poverty, low levels of women's empowerment, high potential for agricultural growth, low access to water resources, and has opportunities for leveraging other USAID, government of Ghana, private sector and donor investments

⁶ [POPULATION OF REGIONS AND DISTRICTS REPORT \(statsghana.gov.gh\)](https://statsghana.gov.gh/population-of-regions-and-districts-report)

⁷ https://census2021.statsghana.gov.gh/gssmain/fileUpload/reportthemesub/2021%20PHC%20General%20Report%20Vol%203D_Literacy%20and%20Education.pdf

⁸ <https://mofa.gov.gh/site/directorates/regional-directorates/upper-east-region>

⁹ [Thematic Brief on Digital Exclusion 260423a.pdf \(statsghana.gov.gh\)](https://statsghana.gov.gh/thematic-brief-on-digital-exclusion-260423a.pdf)

¹⁰ <https://banyanglobal.com/wp-content/uploads/2020/05/USAID-Ghana-Gender-Analysis-Report.pdf>

METHODOLOGY

The assessment was conducted in the Upper East and Northeast Regions, which were selected based on findings from a literature review on soil improvement technology dissemination in northern Ghana. The two regions were selected because they have relatively fewer development interventions compared to other parts of the north, and they also experience extreme climate variability, possess the poorest soils and demonstrate low agricultural productivity.

To achieve the objectives of the assessment, secondary data was collected through a literature review. Subsequently, primary data collection from key agriculture and natural resource management projects being implemented in the two selected regions. Thirteen projects/initiatives were identified by the consultant through contacts provided by EFAT staff, USAID Ghana and other experts in the field. A structured questionnaire was administered for data collection. With the aid of an introductory letter from EFAT, meeting schedules were booked with respondents via emails and phone calls. While most respondents were reached in-person at their respective offices, a few were interviewed virtually (phone calls and video conference calls). All thirteen projects profiled for the exercise, except the International Fertilizer Development Centre (IFDC), were successfully reached and data collected (see Appendix 1). The assessment was carried out between 15th to 31st May 2023.

FINDINGS

CLOSED SOIL IMPROVEMENT INITIATIVES IN UPPER EAST AND NORTHEAST REGIONS

The findings of the assessment exercise revealed that at least twenty one initiatives have implemented soil improvement practices in the target area over the last five years. Out of this number, ten initiatives are on-going, while eleven have been concluded. Among the closed and ongoing initiatives, three of were sponsored by Ghana government (e.g. the Savanna Zone Agricultural Productivity Improvement Project (SAPIP)), while the remaining were implemented by international non-governmental organization (NGOs) and research and development organizations. These initiatives were implemented in the field through local partnerships involving community-based organizations, small and medium enterprises (SMEs) and out grower businesses (OBs). The District Agricultural Departments in the various beneficiary districts were noted to be a strategic partner for all projects implementations. Table 2 summarizes the closed initiatives that supported soil improvement efforts.

Table 2. Soil improvement initiatives in the Upper East and Northeast regions that closed in the last five year

Initiative	Implementer	Period	ISFM Technologies Promoted
Savanna Zone Agricultural Productivity Improvement Project (SAPIP)	Ministry of Food and Agriculture (MoFA)	2018-2022	Improved/certified seeds; inorganic fertilizer

Initiative	Implementer	Period	ISFM Technologies Promoted
Ghana Skills Development Fund	Presbyterian Agricultural Station -Sandema	Jan -December 2021	Micro dosing; crop rotation; manuring
Planting for Food and Jobs	MoFA	2017-2023	Improved/certified seeds; inorganic fertilizer
Agriculture Technology Transfer	FDC	2013-2018	Urea deep placement; inorganic fertilizers; legume intercropping; improved/certified seeds
Ghana Extension System Strengthening Project	Catholic Relief Services	2018-2021	Improved/certified seeds; inorganic fertilizer; crop rotation
Soil Health Program	Alliance for a Green Revolution in Africa	2008-2019	Inorganic fertilizer; improved seed
N2Africa	Alliance for a Green Revolution in Africa	2014-2019	Improved/certified seeds; inoculants; legume based fertilizers
Farmer Managed Natural Regeneration (FMNR) Project	World Vision	2013-2017	Bulk composting; mulching; non-bush burning
Agricultural Development and Value Chain Enhancement I&II	ACDI/VOCA	2014-2020	Improved/certified seeds; inorganic fertilizer; crop rotation
Ghana Commercial Agriculture Project	MoFA	2015-2019	Improved/certified seeds; inorganic fertilizers; organic fertilizer
Ghana Agriculture and Natural Resource Management Project	Winrock International	2016-2018	Improved/certified seeds; composting

ON-GOING AGRICULTURAL ACTIVITIES/INITIATIVES IN THE UPPER EAST AND NORTHEAST REGIONS AND BENEFICIARY TARGETS

The assessment identified ten initiatives that are currently implementing various ISFM practices/technologies. The implementers of these initiatives included government agencies, international NGOs and private organizations. Table 3 shows the current initiatives and specific locations of interventions. The on-going initiatives in the target area collectively cover approximately 50,000 smallholder farmers.

Table 3. Key on-going initiatives promoting ISFM practices/technologies¹¹

Implementer	Project/Program Name	Target Location (region/district)	Target Beneficiaries	Partner Organizations
ACDI/VOCA	Market Systems and Resilience Activity (MSR)	Upper east (Bawku municipal, Bawku west, Garu)	5000	Kusaug Out grower business
		Northeast (East Mamprusi)	4000	Tinanyangi Out grower business
		Northeast (Mamprugu-Moagduri)	2000	Nawonnisigma Out grower business
IDH	Grains for Growth	Upper East region (Binduri, Bawku west, Garu; North East (West Mamprusi and East Mamprusi)	8000	Hillcrest Agritrade
Netherlands Development Organization (SNV)	2Scale	Upper East (Garu, Bawku and Bawku West districts)	3000	Presbyterian Agricultural station-Garu
Ministry of Local Government, Decentralization and Rural Development (MLGDRD)	Resiliency in Northern Ghana (RING II) ¹²	Upper East (Garu, Bawku and Bawku west districts)	4000	MoFA
		Northeast region (east Mamprusi, Mamprusi-Moagduri)	4000	MoFA
IITA	Sustainable Soybean Production in Northern Ghana (SSPiNG)	Upper East region (Binduri, Bawku west, and Bawku municipal)	2000	MoFA
		Northeast region (East Mamprusi);	1000	Tumalala Outgrower business; Gmanbaga Nasara Association; Kosarana Farms

¹¹ Other key projects as the Fertilizer Research and Responsible Implementation Project by IFDC were present in the area but could not be reach for the assessment

¹² The key USAID-funded initiatives including RING II project will however commence field implementation this season.

Implementer	Project/Program Name	Target Location (region/district)	Target Beneficiaries	Partner Organizations
		Northeast region (West Mamprusi district)	2000	WiTAMA Agro Business
OCP Africa ¹³	Agrobooster program ¹⁴	Northeast region (East Mamprusi district, Mamprugu-Moagduri)	2000	Akandem Farms
MoFA	GASIP	Upper east region (Builsa north and south districts)	3000	Akandem Farms
SARI	PESUSI	Upper east region (Bawku and Garu)	1000	MoFA
		Northeast region (East Mamprusi district)	1000	MoFA
YARA	GROW Ghana	Northeast Upper East	6000	AGRA
MoFA	Planting for Food and Jobs (PFJ)	Northeast (all districts); Upper East (All districts)	13000	Out grower business
WFP	Strengthening Food Systems to Empower Smallholder Farmers and Young People Project	YTD	8000	MoFA
ETG ¹⁵	Sustained Africa Initiative	Northeast (all districts); Upper East (all districts)	7000	Agro dealers

The geographical analysis of the ongoing initiatives showed that the Upper East region has fewer soil improvement initiatives compared to the Northeast region. Further analysis shows that the FtF ZOI districts (Bawku West, Garu and Bawku municipal in the Upper East region and Mumprugu-Moagduri and East Mamprusi in the Northeast region) have a higher concentration of initiatives compared to

¹³ OCP conducts free soil testing for farmer

¹⁴ <https://www.ocpafrika.com/en/over-100000-farmers-benefit-ocp-africas-agribooster-program-ghana>

¹⁵ <https://gna.org.gh/2023/05/150000-farmers-to-benefit-from-subsidised-inputs/>

other districts in the same region. USAID's selection of these locations is primarily based on their high poverty levels and considerable potential for agricultural growth.¹⁶

Apart from donor-funded initiatives, several public and private actors disseminate ISFM practices. MOFA provides extension and advisory services to farmers on a wide range of topics including ISFM. Yara Ghana works through the agrodealers network to train agrodealers and extensionist on improved soil improvement technologies. Other EAS providers include Esoko, which offers a platform that provides a range of services to farmers (digital credit, insurance, climate and market information etc.) and FRI, which utilizes a mobile platform and interactive radio as approaches to disseminate agriculture information to farmers.

ISFM TECHNOLOGIES BEING DISSEMINATED

In the target area, a total of fourteen ISFM technologies were being promoted and disseminated. These technologies include inorganic fertilizers, improved/certified seeds, intercropping, minimum tillage, composting, manuring, inoculants, field bunding, micro dosing, organic pesticides, legume-based fertilizers, biochar, green manuring, and agroforestry. Improved/certified seeds, inorganic fertilizer, composting and crop rotation were the four commonly disseminated ISFM practices. The main ISFM practices being disseminated did not show significant variation across different organizations and locations.

ISFM TECHNOLOGY PACKAGING AND DISSEMINATION CHANNELS

The assessment found that the identified initiatives employed ten main approaches to disseminate ISFM technologies to smallholder farmers. The approaches identified are field demonstrations, interactive radio programs, field days, community-based agents¹⁷, posters and brochures, technology fairs, video shows, text and voice messages, lead farmers and community fora. The assessment was unable to obtain detailed information on the content of extension messaging. Among the organizations interviewed, the top three most commonly extension approaches were field demonstrations, interactive radio and community-based agents.

It was emphasized in the assessment that these technology dissemination approaches were tailored to target different categories of smallholder farmers. For example, field demonstrations, interactive radio programs and CBA approaches targeted farmers with lower educational level, whereas text messages and posters targeted farmers who could read. FRI and its local radio stations partners were reported to be a strategic partner in a significant number of initiatives with very interesting and tailored programs such as the Green Leaf e-extension services, which reached 12 million farmers in the country by the end 2022.

¹⁶ <https://meas.illinois.edu/wp-content/uploads/2016/07/MEAS-EVAL-2015-Ghana-ZOI-Moore-et-al-July-2015.pdf>

¹⁷ Community-based agents, also referred to as farmer extensionists or farmer-to-farmer extension, are trained community volunteers who provide informal agriculture extension to smallholder farmers. file:///C:/Users/HP/Downloads/p15738coll2_773.pdf

The assessment also found that efforts were made by many initiatives to disseminate ISFM technologies to farmers in hard-to-reach communities. Approaches that are or have been used to reach last mile farmers include the use of mobile seed/technology vans,¹⁸ and establishment of input sale points in remote communities. Additionally, Village Savings and Loans Associations (VSLA) groups¹⁹ and sole women and sole youth farmer groups are approaches that were reported by respondents to specifically target women and young farmers. In furtherance of special efforts adopted by initiatives to facilitate poor resource farmers whom majority are women, access to ISFM technologies, the assessment found that input dealers now repackage fertilizers and improved seeds in smaller quantity packs (5 kg seeds packs and 10 kg fertilizer packs) for smallholder farmers to be able to afford.

In addition to focusing on disseminating technologies to farmers, many initiatives also strengthen the technical capacity of agricultural extension agents (AEAs) and agrodealers to provide EAS services²⁰. Capacity development approaches used include ToTs and events that expose service providers to new technologies such as pre-season and pre-harvest fora. These trainings are usually organized by project implementing organizations as specialized subject areas at district and regional levels.

Regarding fertilizer subsidies, Ghana re-introduced fertilizer subsidies in 2008 to increase agricultural productivity in line with government's commitment to ensuring food security and improving the living standards of Ghanaians. Several initiatives have since been implemented targeting policy reforms that will increase access of fertilizers to small-scale farmers. The Ghana Fertilizer Platform being coordinated by IFDC's Fertilizer Research and Responsible Implementation (FARARI) Project seeks to contribute to efficient policy reforms in the sector. The Ghana Fertilizer Expansion Programme and Yara's Grow Ghana initiatives are all on the ground to improve fertilizer quality and access by smallholder farmers in line with the Ghana government 2013 Fertilizer policy. Although several initiatives including the Planting for Food and Jobs (PFJ) program, have contributed to a significant increase in fertilizer use from 8 kg/ha in 2016 to 20 kg/ha in 2019, fertilizer use in Ghana is still lower than the Abuja declaration target of 50 kg/ha.

Inputs such as improved/certified seed, fertilizer, and pesticides are provided by agrodealers, who receive technical capacity training from various collaborating NGOs. These agrodealers are well organized and have district, regional and national secretariats called the Ghana Agri-Input Dealers Association (GAIDA).²¹

CHALLENGES IN DISSEMINATING ISFM TECHNOLOGIES AND CONSTRAINTS TO ADOPTION

The dissemination of ISFM technology by the various initiatives covered in the assessment were not without challenges and setbacks. As perceived by informants from the organizations interviewed, these challenges were diverse and numerous, significantly impacting the access and adoption of technologies and practices by smallholder farmers. Upon examining the above table, it becomes evident that

¹⁸ <https://ifdc.org/2018/10/11/achieving-a-last-mile-milestone-the-att-seed-van-initiative/>

¹⁹ VSLA groups are used to facilitate credit availability for especially for women farmer to access technology

²⁰ <https://agrilinks.org/post/agrodealer-networks-change-farmers-fortunes-increasing-access-improved-inputs>

²¹ <https://www.businessghana.com/site/directory/agro-chemicals/23601/Ghana-Agri-Input-Dealers-Association-GAIDA>

smallholder farmers' adoption of ISFM technologies and practices is largely hindered by a combination of constraints. Further analysis of the identified constraints reveals that insufficient technical knowledge on the proper application of technologies, lack of credit to access technology, lack of resources, and the unavailability of technology near smallholder farmers are the three major obstacles reported. Although both men and women farmers are affected by these constraints, women face greater challenges compared to men in adopting ISFM technologies due to their more limited access to crucial resources such as land, labor, capital, and extension and other agricultural services.

Specific constraints hindering the adoption of ISFM technologies by smallholder farmers in the Upper East and Northeast regions of Ghana are outlined in Table 4.

Table 4. Constraints to adopting ISFM technologies

ISFM practice/technology	Constraint to Adoption	Interventions Solutions
Inorganic fertilizer	<ul style="list-style-type: none"> ▪ Limited access/availability ▪ Need for credit ▪ Lack of knowledge about correct application 	<ul style="list-style-type: none"> ▪ Increase dissemination of inputs through agrodealers and other outlets and approaches like seed/technology vans ▪ Use different extension/advisory approaches to provide information to and train farmers
Composting/manure application	<ul style="list-style-type: none"> ▪ Insufficient manure ▪ Lack of labor ▪ Insufficient know-how ▪ Poor land access and control 	<ul style="list-style-type: none"> ▪ Train farmers on non-bush burning ▪ Link farmers to fabricators of labor-saving implements ▪ Provide information and train farmers through different approaches on concept ▪ Community sensitization on land tenure
Crop rotation	<ul style="list-style-type: none"> ▪ Insufficient know-how ▪ Poor access to improved seeds 	<ul style="list-style-type: none"> ▪ Provide information and train farmers through different approaches
Improved/certified seed	<ul style="list-style-type: none"> ▪ Limited access ▪ Need for credit 	<ul style="list-style-type: none"> ▪ Educate and link farmers to input subsidy schemes ▪ Promote last mile input distribution and sale points ▪ Train farmers on application of improved seeds ▪ Train agrodealers on technology packaging to

ISFM practice/technology	Constraint to Adoption	Interventions Solutions
		<ul style="list-style-type: none"> make seed more accessible by poor farmers
Minimum tillage	<ul style="list-style-type: none"> Insufficient knowledge of technology application Over dependence on tractor plough Lack of labor to apply technology 	<ul style="list-style-type: none"> Provide information and train farmers through different approaches Train and link farmers to fabricators labor saving implements
Intercropping	<ul style="list-style-type: none"> Insufficient knowledge of application of technology 	<ul style="list-style-type: none"> Train agriculture extensionist and farmers Distribute technology materials to farmers
Field bunding	<ul style="list-style-type: none"> Lack of labor 	<ul style="list-style-type: none"> Train and link farmers to labor saving implements Enhance farmer savings schemes to allow farmers to hire labor
Micro dosing	<ul style="list-style-type: none"> Insufficient knowledge of application of technology 	<ul style="list-style-type: none"> Provide information and train farmers through different approaches

CONCLUSION AND RECOMMENDATIONS

Smallholder farmers remain a rallying point in Ghana’s development, and improving their farm productivity is no doubt a key strategy to improving their well-being and contribute to the socio-economic development of the country. However, these smallholder farmers face various challenges, including deteriorating soil conditions, which contributes to the existing yield gaps and declining soil fertility, that calls for urgent proactive measures to address the situation.

Multiple initiatives have made efforts to disseminate ISFM practices in Northern Ghana, resulting in relatively high awareness among farmers. A study carried out in the Northern Region in 2019 found that 86% of surveyed farmers were aware of some ISFM practices²². Despite this significant achievement, adoption of the technologies for soil enhancement and agriculture productivity technologies remains low in the target area.

Table 4 provides realistic and sustainable measures that can be taken to mitigate the identified constraints encountered by smallholder farmers and facilitate their access and adoption of specific ISFM technologies that suits their specific locations and value chains. The analysis of the proposed solutions shows that technical capacity of both agriculture extensionist and advisory service providers such as

²² A. Abukari and R. Abukari, 2020. “[Awareness of Integrated Soil Fertility Management Practices in the Savelugu Municipal of the Northern Region of Ghana](#)”. *Rural Sustainability Research*, 43 (338).

AEAs, agro dealers, community-based agents, out-grower businesses need to be strengthened through trainings. This is in sync with findings from the assessment which suggests that service providers lack the technical know-how to effectively facilitate farmer adoption of ISFM technologies. FAO’s soil doctor program,²³ which provides capacity building opportunities for extension agents and CBAs to expand their knowledge on soil health and sustainable soil management interventions, is a great resource and one approach for farmer-led trainings.

Improving inputs and technology distribution channels and mechanisms such as last mile sale points, fertilizer subsidy schemes,²⁴ and seed and technology vans need to be explored and strengthened. Farmers need to be linked to fertilizer subsidy programs such the PFJ Programme and Yara’s Grow Ghana initiative being implemented in partnership with AGRA through the African Fertilizer and Agribusinesses Partnerships (AFAP) and USAID, to facilitate timely access to quality fertilizer. This should be supported by appropriate soil testing of farmers’ fields to ensure that farmers know the fertility status of their soils and are able to choose the appropriate technology to improve it. Opportunities should be explored to identify possible entrepreneurial roles that youth could play in this activity.

The Upper East region, described in literature as the poorest part of the country²⁵, that also suffers from difficult climatic conditions, relatively high population density and a high level of underdevelopment, is recommended as the target region for ADSIP Project interventions. The number of initiatives implemented in the region are also low compared to other regions including the Northeast region, which was curved out recently from the Northern Region, considered to be the hub of NGOs in Ghana. The Upper East region has Departments of Agriculture offices in the various districts that will support the rapid implementation of the ADSIP Project alongside local NGOs, SMEs, agro dealers and out grower businesses and local radio stations.

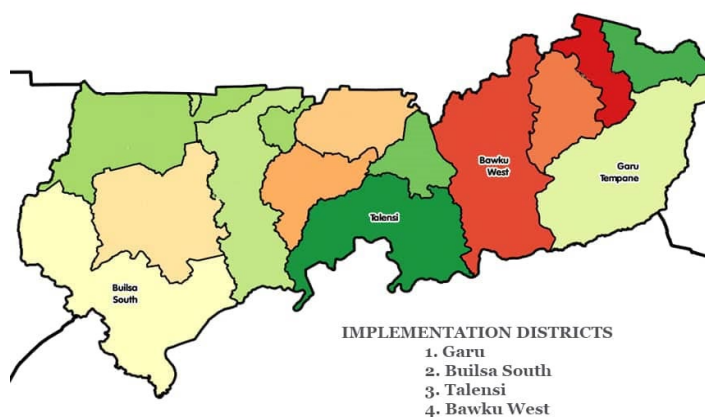


Figure 2. Map of Upper East Region showing the four

It is recommended that the project targets four districts (see Figure 2) in the selected region: Garu and Bawku West municipalities, falling under the USAID FtF ZOI, and Builsa South and Talensi districts, which are non-FtF districts. These districts are among the poorest in the region,²⁶

²³ [About the Programme | Global Soil Partnership | Food and Agriculture Organization of the United Nations \(fao.org\)](https://www.fao.org/about-the-programme/global-soil-partnership/food-and-agriculture-organization-of-the-united-nations)

²⁴ Yara’s Grow Ghana initiative and Planting for Food and Jobs program by the government of Ghana are good springboards to enhance farmers access to technology

²⁵ <https://journals.ug.edu.gh/index.php/gjg/article/view/461/242>

²⁶ <https://gnhr.mogcsp.gov.gh/index.php/news-and-events/archive-news/garu-and-tempane-rated-poorest-districts-in-uer>

yet have high agricultural potential that is hindered by infertile soils. By focusing on these areas, the ADSIP Project can make a significant impact on improving soil fertility and boosting agricultural productivity among smallholder farmers in Ghana.

ANNEXES

ANNEX 1. PROJECTS/INDIVIDUALS INTERVIEWED FOR THE RAPID ASSESSMENT

Organization	Project	Person(s) Interviewed	Place of Operation	Mode of Interview	Date and Time of Interview
ACDI/VOCA	Market Systems and Resilience Activity (MSR)	Cecil Osei/Deputy Chief of Party cosei@acdivocaghana.org	Tamale (Northern)	In-person (conference)	25 th May 2023 2:00 pm
		Michael Owusu Amaniampong Market Systems Team Lead mowusu@acdivocaghana.org	Bolgatanga		17 th May 2023 9am
Alliance for a Green Revolution in Africa (AGRA)	Partnership for Inclusive Agricultural Transformation in Africa (PIATA)	Dr. Asseta Diallo/Senior Program Officer, Soil Fertility and Fertilizer Systems, AGRA W/Africa adiallo@agra.org	Accra	Virtual	25 th May 2023 3pm
Regional Advisory Information and Network Systems (RAINS)	Climate change in Northern Ghana Project	Hardi Tjani/Executive Director Tijani.hardi@rainsgha.org	Tamale (Northern)	In-person (conference)	16 th May 2023 9am
Savana Agriculture Research Institute	Participatory Pathways to Sustainable Intensification	Dr. Edwin Korbla Akley/ senior scientist akleykorbla@gmail.com	Nyankpala (Northern)	In-person (Conference)	16 th May 2023 11am
Simple prince Agro company	Dealership	Director	Bolga (Upper East)	In-person (conference)	18 th May 2023 10am

Organization	Project	Person(s) Interviewed	Place of Operation	Mode of Interview	Date and Time of Interview
Sustainable Trade Initiative	Grains for Growth	Robert Asugre/Country Director asugre@idhtrade.org	Accra	Virtual call	16 th May 2023 11am
Ministry of Local Government, Decentralization and Rural Development	RING II	Isaac Bediako Osei-Owusu Deputy Chief of Party Isaac_oseiowusu@abtassoc.com Gabriel Timbillah Resilience Lead Gabriel_timbillah@abtassoc.com	Tamale	In-person (Conference)	16 th May 2023 10am
International Institute for Tropical Agriculture	Sustainable soybean production in Northern Ghana	Prof. Samuel Adjei- Nsiah /Project Coordinator S.Adjei-Nsiah@cgiar.org	Tamale (Northern)	In-person (conference)	16 th May 2023 11am
PLAN International Ghana	Women’s Innovation for Sustainable Enterprises	Rose Aawulena Project Manager Rose.aawulena@plan-International.org	Tamale (Northern)	Virtual (phone call)	31 st May 2023 8am
Menonite Economic Development Association	Greater Rural Opportunities for Women (GROW 2.0)	Francis Essuman Project Manager fessuman@meda.org	Tamale (Northern)	In-person (Conference)	16 th May 2023 5pm
YARA	Grow Ghana Initiative	Abdul-Rahaman Mahama YARA Zonal Manager	Tamale (Northern)	Virtual	17 th June 2023 3pm
URBANET	Women’s Innovation for Sustainable Enterprises	Mohammed Zibril Basit/Executive Director Kindbasit@gmail.com	Tamale (Northern)	In-person (conference)	15 th May 2023 11am

Organization	Project	Person(s) Interviewed	Place of Operation	Mode of Interview	Date and Time of Interview
MoFA (Reg Offices)	Ghana Landscape Restoration and Small-Scale Mining Project Planting for Food and Jobs (PFJ) Ghana Agricultural Sector Investment Project	Upper East Zakaria Fusieni, Regional Director kfzackfus@yahoo.com NorthEast Fausta Ayale/Monitoring and evaluation Officer faustayale@yahoo.com	Bolgatanga Nalerigu	In-person (conference)	15 th May 2023 10am
World Food Programme	Strengthening food systems to Empower Smallholder Farmers and Young People	Chris Ibyisintabyo/Program Policy Consultant chris.ibyisintabyo@wfp.org Peter Baghr/Programme policy Officer peter.baghr@wfp.org	Accra Tamale	Virtual call	23 rd May 2023 9am 26 th May 2023 8am
Organic Green Ventures	Building Climate resilience of smallholder farmers through practices soil enhancement	Martin Yelibora Founder of Green Ventures Organicgreen.gh@gmail myelibora@yahoo.co.uk	Damongo	Virtual call	20 th May 2023 3pm