



# FEED <sup>THE</sup> FUTURE

The U.S. Government's Global Hunger & Food Security Initiative



## Feed the Future Ghana Agriculture and Natural Resources Management Project Annual Progress Report Fiscal Year 2017



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# Feed the Future Ghana Agriculture and Natural Resources Management Project Annual Progress Report

Fiscal Year 2017 | October 1, 2016 to September 30, 2017

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## ACTIVITY/MECHANISM Overview

<b>Activity/Mechanism Name:</b>	Feed the Future Ghana Agriculture and Natural Resource Management
<b>Activity/Mechanism Start Date and End Date:</b>	May 2, 2016 – April 30, 2021
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<b>Geographic Coverage (States/Provinces and Countries)</b>	Upper East, Upper West and Northern Regions, Ghana, West Africa
<b>Reporting Period:</b>	October 1, 2016 – September 30, 2017

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## ACRONYMS AND ABBREVIATIONS

ADVANCE	USAID Agricultural Development and Value Chain Enhancement Project
AgNRM	USAID Agriculture and Natural Resource Management Project
BVC	Black Volta Corridor
CA	Conservation Agriculture
CEC	CREMA Executive Committee
CECOTAPS	Center for Conflict Transformation and Peace Studies
CREMA	Community Resource Management Area
CRMC	Community Resource Management Committee
CRIG	Cocoa Research Institute of Ghana
CSA	Climate Smart Agriculture
EBC	Eastern Biodiversity Corridor
EPA	Environmental Protection Agency
EMMP	Environmental Mitigation and Monitoring Plan
ESDST	Ecosystem Services Decision Support Tool
FAO	United Nation's Food and Agriculture Organization
FC	Forestry Commission
FinGAP	USAID-Financing Ghanaian Agriculture Project
FSD	Forest Services Division
FtF	Feed the Future
FY	Fiscal Year
GIS	Geographic Information System
GoG	Government of Ghana
GPS	Global Positioning System
GSA	Global Shea Alliance
IBN	Interest Based Negotiations
IK	Indigenous Knowledge
M&E	Monitoring & Evaluation
MOFA	Ministry of Food and Agriculture
MoU	Memorandum of Understanding
MUS	Multiple-Use Water Services
NCRC	Nature Conservation Research Centre
NGO	Non-Governmental Organization
NRP	Natural Resource Product
OFSP	Orange Flesh Sweet Potato
PMEP	Project Monitoring and Evaluation Plan
Q	Quarter
RFA	Request for Applications
RING	USAID Resiliency in Northern Ghana Project
SAVIX	Savings Groups Information Exchange
SFC	Savannah Fruits Company Ltd
SKGK	Sanyiga Kasena Gavara Kara
TNS	TechnoServe
USAID	United States Agency for International Development
USFS	United States Forest Service

USGS	United States Geological Survey
VSLA	Village Savings and Loan Association
WBC	Western Biodiversity Corridor
WCHS	Wechiau Community Hippo Sanctuary
WD	Wildlife Division
WITAMA	Web Interactive Tool for AgNRM Management
WRC	Water Resources Commission
ZOI	Zone of Influence

# 1. ACTIVITY IMPLEMENTATION PROGRESS

The Feed the Future (FtF) Ghana Agriculture and Natural Resource Management (AgNRM) Project is a five-year, \$24,900,000 program that will run from May 2, 2016, to April 30, 2021. AgNRM is implemented by Winrock International, in partnership with TechnoServe (TNS), Nature Conservation Research Centre (NCRC), and Center for Conflict Transformation and Peace Studies (CECOTAPS).

The project supports USAID|Ghana's Development Objective 2 and the Ghana FtF Multi-Year Strategy. Winrock's AgNRM approach builds on USAID's resilience strategy and its investments in the FtF Zone of Influence (ZOI). AgNRM will achieve the project goal of poverty reduction through sustainable increases in wealth and nutrition from natural and non-traditional agriculture products by addressing environmental, agricultural, governance and natural resource management challenges. AgNRM project activities are being implemented under four project outcomes: 1) Increased Incomes from Natural Resource Products; 2) Improved Food and Nutritional Security; 3) Increased Farmer and Community Security/Access to Land and Natural Resources; and 4) Strengthened Environmental Stewardship. The annual progress report focuses on progress made toward achieving results under these four interrelated outcomes during FY 2017|Year 2 (October 1, 2016 to September 30, 2017).

## Progress Narrative & Implementation Status

FY 2017 was AgNRM's first full year of implementation, during which the team quickly shifted from project start-up to full implementation under all four project outcomes. The year started with AgNRM's official launch on October 2, 2016 at Mole National Park and ended with in-kind grant ceremonies in five of AgNRM's targeted Community Resource Management Areas (CREMAs). By the end of FY 2017 AgNRM was implementing activities in eight landscapes situated in three biodiversity corridors in northern Ghana.

The project made considerable progress toward the realization of its objectives and project goal in FY 2017. A total of 6,261 people in six targeted CREMAs benefited from an expansive portfolio of capacity building opportunities. Out of the total number of people trained, 1,221 reported an increase in economic benefits derived from sustainable natural resource management and conservation, with 405 indicating that their incomes from AgNRM's targeted natural resource products (NRPs) increased over the last 12 months. A total value of sales of \$201,000 was realized by NRP entrepreneurs in AgNRM's ZOI. The increase in the value of sales was positively influenced by improved market access and the introduction of new NRP production opportunities championed by the AgNRM project team during the reporting year. A total of 150 firms received technical assistance for improving business performance; these include Village Savings and Loan Associations (VSLA) (104), producer/collector groups that have entered a purchase agreement with an end-market shea buyer (16), moringa entrepreneurs (29) and the Wechiau CREMA, which receives premium for the sale of organic shea sold to the Wechiau organic shea processing center.

To increase women's access to land and tenure security, the team supported community members to identify and map land plots for 477 households and produced 251 land plot maps. The third and final stage of the land agreement process involves completing and signing an approved land agreement document, which will be completed in the first half of FY 2018. AgNRM's annual survey results indicate 1,347 people applied technologies or management practices learned through AgNRM training, and beneficiaries applied one or more of the newly learned improved technologies and management practices to approximately 1,942 hectares. See [Annex A](#) for AgNRM's FY 2017 Performance Indicator Matrix.

## Implementation Challenges

AgNRM faced some challenges during Year 2, as we worked with AgNRM's principle GoG partner, the Forest Commission's (FC) Wildlife Division (WD), to establish a clear protocol of engagement

between WD and the AgNRM project. The lag in establishing a clear partnership protocol resulted in slight delays in several CREMA focused activities under 4.1 and required a temporary suspension on all activities in AgNRM's Western Biodiversity Corridor CREMAs in Q3. However, with clear protocols now established, and with open and regular communication and joint planning between WD and the AgNRM management team, we have overcome these initial implementation challenges. By the year's end, a positive working relationship was solidly in place.

## 2. INTEGRATION OF CROSSCUTTING ISSUES

### Stakeholder Engagement and Partnerships

In the first full year of implementation, AgNRM expanded its stakeholder engagement with GoG partner agencies and developed partnerships with complementary USG agencies. For instance, to address the lack of high resolution maps (from remotely sensed data) and related technical capacity needs within GoG partner agencies, AgNRM collaborated with the United States Geological Survey (USGS) through an ongoing inter-agency collaboration with USAID|Ghana, to develop and provide Land Cover Land Use maps of project areas. Such maps will serve as a foundation for managing and monitoring the highly fragile savanna ecosystems of the AgNRM's ZOI. In Q2|FY 2017, a technical team consisting of AgNRM, USGS and USAID|Ghana visited the project sites and engaged regional heads of the Forest Services Division (FSD), Wildlife Division (WD), Environmental Protection Agency (EPA) and the Water Resources Commission (WRC) to conduct a needs assessment. The team identified the mapping and spatial data needs of the partner government agencies and AgNRM's targeted CREMAs, as well as their technical capacity needs. USGS has since developed detailed high-resolution land cover maps for the AgNRM CREMAs in the Black Volta Corridor (BVC) and a set of time-series maps for the GoG. AgNRM, with the support of USGS, will organize specialized training sessions and refresher courses for the project team and GoG partner agencies in FY 2018. This will advance and improve efforts to monitor the environment within AgNRM's ZOI, as well as promote a better understanding of the current condition of northern Ghana's ecosystems.

To mitigate the occurrence of wildfire, AgNRM partnered with the United States Forest Service (USFS). Wildfires undermine efforts by local communities to conserve their natural resources, as the seasonal fires eliminate or suppress natural regeneration, resulting in widespread environmental degradation. In Q2|FY 2, AgNRM and USFS conducted a technical fire regime assessment of the project sites. This collaboration has enabled AgNRM to establish baseline information on the frequency and extent of wildfire. The project team now has a better understanding of the underlying causes and ecological impact of wildfire on the natural resource base in AgNRM's targeted CREMAs. The resulting assessment report (USFS 2017)<sup>1</sup> highlights the importance of fire control in managing natural resources in AgNRM's ZOI and will inform the approach and design of fire management activities in the CREMAs in Year 3.

AgNRM deepened collaboration with GoG partner agencies in FY 2017 through regular meetings at the national, regional and district levels. The project team held consultative meetings with the Regional and District Agricultural Development Units of the Ministry of Food and Agriculture (MOFA) and with staff from the national and regional offices of the Forestry Commission (FC), EPA, and the WRC to share work plans and agreed on activities for collaboration and on protocols for effective engagement at the implementation level. Close collaboration with our GoG partners ensures that project interventions are well aligned with government programs and policies.

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<sup>1</sup> United States Forest Service [USFS]. 2017. Strategy for Wildfire Management in Northern Ghana. Unpublished Report, USFS Accra.



In Q2 of FY 2017, AgNRM and the WD organized a joint forum for stakeholders in the Western and Eastern Biodiversity Corridors on uncontrolled harvesting of rosewood and mining, leading to an increased awareness among key partners and commitment to working together to address these high-profile threats. In Q3, the project team and the northern zonal office of the WD worked together to develop a set of protocols for effective engagement and to enhance collaboration in the Western Biodiversity Corridor (WBC). As part of this effort, the project team held planning meetings with the WD in Q4 to agree on a set of activities for joint implementation in FY 2018 and AgNRM's partnership with the WD continues to strengthen in the WBC, a partnership that will be replicated in the Eastern Biodiversity Corridor (EBC).

Once every quarter, AgNRM and the WD met to identify joint activities to be implemented under the AgNRM project. These meetings are part of ongoing efforts to deepen collaboration and establish clear lines of communication. Joint activities include transboundary visits to Burkina Faso, biomonitoring and training of trainers for CREMA Executive Committees (CEC). WD and AgNRM also discussed the need for well-coordinated implementation strategies for specific AgNRM activities including beekeeping, shea processing, Village Savings and Loan Associations (VSLAs), moringa and orange flesh sweet potato (OFSP) cultivation and the adoption of Climate Smart Agriculture (CSA) practices in WBC CREMA communities, where the GoG is also implementing the World Bank funded Sustainable Land and Water Management project.

In the last quarter of FY 2017, the AgNRM team met with WD to solicit their input into the selection of AgNRM's last two targeted landscapes in the EBC. The teams discussed potential conflict zones in the EBC as well as factors that should be considered during the selection of the CREMAs. Participants agreed that creating CREMAs across chiefdoms will help reduce conflicts in the areas, and will support the conservation of key natural resources across the chiefdoms. The team agreed on a roadmap for the creation of the two EBC CREMAs.

AgNRM also met with the Upper East Regional Agricultural Development Unit of MOFA, as well as with selected District Agricultural Development Units in the WBC and EBC in Q3 of FY 2017. The project team and the Regional and District Directors of Agriculture (and their extension officers) exchanged activity plans and identified areas for cooperation and agreed on a protocol for engagement. This is to ensure synergy between the activities, plans and policies of the Regional and District Directorates of Agriculture and avoid duplication of efforts. As a result of the exchanges, the project team gained a better understanding of the District Directorates of Agriculture within the WBC and EBC. The Upper East Regional Extension Officer, Mr. Alhassan, highlighted the lack of capacity of women in quality shea processing as well as lack of guaranteed markets for the shea products in the Upper East Region. He indicated the Regional and District Agricultural Development Units will work hand in hand with the AgNRM to address some of the many challenges confronting farmers in the Districts where AgNRM is working.

The continued collaboration with other FtF projects has resulted in significant benefits for the AgNRM project. For instance, the Resiliency in Northern Ghana (RING) project provided quick and meaningful support as AgNRM introduced the OFSP in our targeted CREMAs. USAID's Agricultural Development and Value Chain Enhancement (ADVANCE) project joined forces with AgNRM to organize the first Climate Smart Agriculture Forum, in FY 2017|Q3 and to support AgNRM's efforts to educate farmers about the Fall Army Worm.

## Communications

AgNRM's Communications Strategy was completed in FY 2017|Q2. The strategy defines AgNRM's framework and approaches to communicate project activities, progress and successes with targeted audiences including GoG partner agencies, thought leaders and the public. During Year 2, AgNRM drafted several communications deliverables such as CREMA factsheets that highlight AgNRM activities in each of the targeted landscapes. In addition, AgNRM drafted thematic factsheets on

targeted value chains, land tenure activities, CSA, and VSLAs. This set of materials will be finalized in Year 3.

In Year 2, AgNRM visited media outlets in Wa to introduce the project to potential media partners, including the Daily Graphic, Ghanaian Times, Business and Financial Times, the Multimedia Group (Joy News/FM), Ghana Television and the Ghana News Agency, leading to coverage of several major AgNRM activities, including the project's CSA Forum and the in-kind grant ceremonies. The AgNRM communications team also developed content for social media platforms including Facebook, Twitter and Instagram. Sharing AgNRM's news through social media contributes to the project's visibility efforts. AgNRM worked with USAID|Ghana's Development Outreach and Communications team to ensure the USAID receives AgNRM's social media content and other project communications materials. The AgNRM team also developed and documented success stories; please see [Annex B](#) for AgNRM's featured success stories for FY 2017.

In the last quarter of the reporting period, AgNRM developed a communications framework to highlight gender activities that address existing inequalities between men and women in AgNRM target CREMAs. The framework, which will be implemented in Year 3, integrates inputs from AgNRM's behavior change communications activities.

**Behavior Change Communication.** In Year 2, AgNRM focused on educating community members about the cultivation and consumption of highly nutritious, Vitamin A rich crops, with a focus on the OFSP. The campaign to promote OFSP in the 2017 production season resulted in more farmers than anticipated requesting seed vines.

In Q4 the Behavior Change Communication Specialist worked closely with the Director of Communications and AgNRM's Gender Specialist to educate and train community leaders and households on prevailing child labor issues in project communities, training over 600 participants on this important topic.

## Gender Integration

AgNRM's Gender Integration Strategy<sup>2</sup> was finalized in FY 2017|Q3. The strategy outlines AgNRM's approach to transforming gender relations in the project communities. Successful implementation of the strategy will bridge gender gaps and ensure that women benefit from AgNRM's interventions. In Q1, AgNRM, with technical support from USAID's gender point of contact, Susan Bonney, held a training session for the project team to introduce the team to USAID's gender programming and frameworks. Following the workshop, AgNRM's Gender Specialist held 'training of trainers' sessions for the field staff. This equipped them to conduct gender training and sensitization sessions in targeted communities. Community participants discussed gender inequalities and the impacts of women's unequal access to and control over natural resources on their households and communities. As a result of the gender sensitization, community leaders now have greater appreciation of the negative consequences of gender inequalities on their communities' development and well-being and support AgNRM's efforts to address these inequalities. Feedback from the community-level gender trainings was incorporated into AgNRM's revised community gender training manual. Throughout FY 2017, AgNRM's Gender Specialist provided technical support to outcome leads to ensure gender considerations are prioritized in the planning and implementation of project activities. Gender issues were addressed during training sessions on entrepreneurship and leadership skills; activities that have strengthened women's effective participation and role in the project.

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<sup>2</sup> AgNRM Gender Integration Strategy (June 2017)

## AgNRM Small Grants

The AgNRM grants manual was finalized in FY 2017|Q3, paving the way for the team to begin implementing AgNRM grant activities. In Q4 USAID granted approval for AgNRM to issue subawards in the form of in-kind grants to five CREMAs. Before the end of FY 2017, AgNRM had delivered equipment and materials, valuing approximately \$15,000 for each CREMA, to the Wechiau and Zukpiri CREMAs in the BVC and for the three AgNRM-targeted CREMAs in the WBC: (Builsa Yening, Sanyiga Kassena Gavara Kara (SKGK) and Moagduri Wuntanluri Kuwansasi (MWK).

A request for applications (RFA) was issued on July 7, 2017, soliciting applications from qualified registered NGO's and private enterprises with experience in shea, moringa, dawadawa and/or tamarind value chains, and interested in investing in AgNRM-targeted CREMAs based in Wechiau, Dorimon and Zukpiri. A pre-application workshop was organized in Tamale by the AgNRM team on July 25th to educate potential grantees, during which the participants were given an overview of the project, a summary of the AgNRM small grants programs and the requirements under RFA 001. A technical review committee evaluated seven applications that met the minimum requirements. Before the end of FY 2017, four of the seven had been selected for further review before final selection, which will take place in early FY 2018.

AgNRM RFA 002 was issued in September 2017, which targets qualified firms with substantial experience in developing and disseminating quality information, knowledge and skills to promote new behaviors and attitudes and empower community members. One or more service providers will be selected in FY 2018|Q1.

## Monitoring and Evaluation (M&E) Plan & Implementation

Monitoring results through indicators is a critically important component of managing AgNRM's performance. Over the last year, several strategic actions have been taken by AgNRM management to strengthen the M&E team to effectively and efficiently collect and report quality data.

AgNRM's M&E Team was fully staffed by FY 2017|Q3 with the arrival of a new M&E Director and two M&E Officers assigned to AgNRM's satellite offices in Wa and Sandema. The M&E Officers have been an invaluable addition to the AgNRM project, allowing for more accurate and timely field monitoring and data collection, analysis and reporting.

AgNRM finalized and submitted the project's Project Monitoring and Evaluation Plan (PMEP), in accordance with comments from USAID|Ghana and the Bureau for Food Security (BFS), Washington. The PMEP was approved by USAID in Q3 and is being implemented accordingly, but will need to be further revised once the final two CREMAs in the EBC have been defined.

The project initiated the processes for the baseline survey and profiling of the project's beneficiaries early in FY 2017; however, this was delayed due to staffing transitions and the need to finalize the project's PMEP before moving forward. Documents related to the project's baseline were finalized and submitted to USAID in the third quarter of Year 2. These included: 1) the methodology for AgNRM's Annual Monitoring Survey; 2) AgNRM's Household Form and Baseline Questionnaire; and 3) a request for proposals to conduct the baseline survey work. These baseline documents received approval from USAID|Ghana in FY 2017|Q4, paving the way for AgNRM to initiate the process for engaging a service provider to conduct the survey and profile the project's beneficiaries in Q4. Data collection is currently underway and final report due FY 2018|Q1.

The M&E team designed the architecture of AgNRM's web-based M&E system in the first quarter of FY 2017. AgNRM has named the new system "WITAMA" which stands for "Web Interactive Tool for AgNRM Management." The firm engaged to develop WITAMA completed the design of the web and mobile applications (apps) for data collection and storage, which are being used for the baseline

survey and profiling of the project's beneficiaries. Subsequently, mobile apps will be developed and integrated with the beneficiaries' profiles for all routine data collection tools to ensure real time access to quality and credible data. An ArcGIS geo-database has also been created by the GIS Specialist to manage the spatial data. These data are stored locally as shapefiles, which will be migrated into WITAMA when completed. AgNRM expected WITAMA to be fully operational before the end of FY 2017; however, this could not be achieved because of delays in profiling AgNRM beneficiaries. WITAMA will be fully operational in the first quarter of FY 2018.

## 3. ACTIVITY PROGRESS BY OUTCOME

### Outcome 1 – Increased incomes from natural resource products

Outcome 1 facilitates improved incomes of beneficiaries from shea, moringa, dawadawa and tamarind using a value chain approach. In Year 2, Outcome 1 activities contributed to increased understanding of the income generation potential of targeted natural resource products (NRPs), as well as improving the quality of shea products to meet international standards. The team produced an interim Shea Roadmap,<sup>3</sup> finalized an economic tree inventory in the BVC, trained collector/producer groups on ways to increase the value of the NRPs collected and processed in targeted communities, established new market linkages, and introduced beneficiaries to energy-saving cook stoves.

#### *1.1 Natural resource value chains developed*

##### Prepared sector analyses and market systems upgrades

In FY 2017, the AgNRM team focused on analysing the shea, moringa, tamarind, and dawadawa value chains in the project's targeted landscapes to identify bottlenecks and opportunities to increase product competitiveness and provide baselines from which the project will measure the results and impact of project interventions. The analyses<sup>4</sup> indicated large numbers of women are involved in one or more of AgNRM's four targeted value chains, but the limited volumes and variable quality processed by the local collector/processor groups limit their market options and opportunities. NRP markets in northern Ghana are characterized by geographically-dispersed small producers who have limited access to improved processing technologies, little access to credit and poor access to markets. Based on the findings, the AgNRM team engaged and trained collector/processor groups in six CREMAs to strengthen their organizational capacity and improve the quality of their production and helped women develop a variety of market linkages. By the end of Year 2 AgNRM had developed and delivered customized training on moringa product production and marketing that has enabled at least 29 women to begin new NRP-based enterprises.

The AgNRM team engaged trade associations (Shea Network Ghana and Global Shea Alliance) and certification bodies (Ecocert and GoG's Food and Drugs Authority) to identify the most appropriate quality standards to apply to the project's four targeted value chains. In Year 2 two CREMAs, Zukpiri and SKGK, expressed a strong interest in pursuing organic certification for shea and moringa in portions of their CREMA landscapes. Many NRP collectors/processors are interested in meeting the international standards for selling their shea kernels in the conventional (non-organic) market, while others were motivated by the opportunity to produce value added NRP-based products, such as oil, cosmetics, soap, and food additives to sell in the local and regional markets. The team engaged the Food and Drugs Authority to begin the certification process for the products AgNRM-supported NRP entrepreneurs have begun producing and selling. Proper certification ensures that CREMA collectors and processors are able to produce and sell their NRPs to a wider market.

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<sup>3</sup> The Shea Roadmap will be updated in Year 3 to include AgNRM's sites in the EBC and to include an investment plan.

<sup>4</sup> NRP Sector Analyses, collector/producer group profiling, Inventory of Economic Trees in the Black Volta Corridor, see [Annex E](#) for a complete list of resources produced by AgNRM in Year 2.

In Year 2 AgNRM identified and profiled 10 moringa, tamarind and dawadawa small, medium and large-scale processors and end market actors to provide market avenues for the NRPs. A number of these private enterprises have indicated they are interested in investing in AgNRM's targeted CREMAs, and several made modest commitments in FY 2017. For example, Moringa Connect distributed 10 kilograms of seeds to 29 CREMA farmers in Dorimon and Savannah Fruits Company Ltd (SFC) expressed interest in purchasing both seeds and leaves from the farmers in the Wechiau CREMA. Boboboo Enterprise and Ghana Permaculture facilitated moringa utilization training sessions for BVC and WBC CREMAs, respectively.

AgNRM trained shea collectors/processors in organic certification and started working with an organic certification body, Ecocert, to audit and certify the Zukpiri CREMA, and a select number of shea entrepreneurs from CREMA communities on collecting, processing and marketing organic shea kernels and butter. Year 2 ended with the Zukpiri CREMA and 240 female collector/processors preparing to be audited by Ecocert, as one of the final steps required to obtain organic certification. The certificate will be held in the name of the CREMA and will provide the opportunity for additional shea entrepreneurs in the CREMA to access the niche organic market, which pays a premium for organic products.

#### Organized and strengthened producer/collector groups

To strengthen NRP groups in Year 2, AgNRM selected 800 CREMA residents to build their capacity on NRP utilization. This activity targeted group members to grow their nascent NRP enterprises by building their capacity to produce commodities that meet market specifications and linking them directly to market opportunities, which will empower these entrepreneurs to grow their businesses and enhance their incomes.

AgNRM trained interested community members on moringa processing, specifically on the production of moringa-based products including *tom brown* (a local porridge), baby food/porridge, soaps and cosmetics. As a result, the beneficiaries are earning



**Photo 1. AgNRM is helping shea collectors and processors to grow their businesses**

supplementary income that builds their household's resilience – extra cash enables them to more readily address both daily and unexpected needs. For example, every two days Pokua Solomon, of Dorimon CREMA, earns approximately \$14.00 (Ghc 60) from producing and selling moringa-based laundry soap. Following the initial training, AgNRM supported an additional 120 women and four men who expressed interest in starting up their own moringa-based enterprises. One such novice NRP entrepreneur, Kasim Sahadatu, enthusiastically reported: *"I prepare moringa-based tom brown and cerelac [infant cereal] and sell it in my community and at the local market. I make an average of \$23 (Ghc 100) a week!"*

AgNRM Year 2 ended with twelve of the new moringa entrepreneurs from the BVC participating in the 8<sup>th</sup> National Food and Agricultural Fair in Tamale, who earned \$278 (Ghc 979) from their sales. The budding entrepreneurs expressed their excitement about the event; Kaminang Mwini-ibu of the

Wechiau Community Hippo Sanctuary (WCHS) CREMA remarked: *“I was able to secure a market for my moringa oil – a soap production company in Tamale is interested in buying whatever I can produce. I quickly sold all my moringa oil at the fair and made over \$50 (Ghc 216). I am very grateful to AgNRM for this opportunity.”*

### *1.2 Increased income from the shea butter value chain*

Developed a comprehensive roadmap for shea sector investments

In Year 2 AgNRM completed a Shea Roadmap to guide project interventions and for use by industry players throughout the shea value chain. AgNRM also identified and profiled 18 potential shea buyers and investors, whom the project began linking to shea entrepreneurs in AgNRM’s targeted CREMAs.

Developing the Shea Roadmap involved engaging stakeholders nationwide to build knowledge and relationships with private and public-sector actors, to identify the necessary elements for improving the enabling environment and enhancing opportunities for shea value chain actors to collaborate within and beyond AgNRM’s targeted CREMAs. AgNRM’s Shea Roadmap articulates current shea supply and demand; explores domestic, international and niche markets; identifies opportunities to increase competitiveness and ways to address weaknesses in and threats to the industry. The document also provides the foundation on which AgNRM can build a robust activity plan for the coming years.

In August 2017, 124 stakeholders attended AgNRM’s Shea Roadmap validation workshop. Participants included project beneficiaries and partners (CREMA representatives, AgNRM project staff and USAID); government agencies (MOFA, FC); research institutions (University for Development Studies, Cocoa Research Institute of Ghana (CRIG)); international organizations (FAO); local and international NGOs (Mennonite Economic Development Associates, SNV, Catholic Relief Services); other USAID projects with concurrent interests (USAID FinGAP, RING); shea collectors; private companies throughout the value chain (aggregators, traders, international buyers and processors, local processors, and brands and retailers); and Ghana’s national shea trade association (Shea Network Ghana). Market players and research institutions expressed interest in collaborating with and supporting the AgNRM project. To remove market barriers, AgNRM is collaborating with Global Shea Alliance (GSA) to disseminate information about industry requirements to link shea collectors to improved market opportunities. AgNRM is addressing several issues affecting the quality of locally processed shea by partnering with InStove to provide AgNRM CREMA communities with highly-efficient, ‘cleaner and greener’ (less smoke and less fuel) cook stoves. And, in Year 3 AgNRM will collaborate with CRIG to implement shea propagation techniques in AgNRM’s targeted CREMAs to improve yield and reduce the gestation period of the shea crop.

Maximized market opportunities through private sector and collector/processing groups

In FY 2017 AgNRM focused on maximizing opportunities for AgNRM targeted shea collector/processors across shea markets. AgNRM targeted individual shea entrepreneurs and shea collector/processor groups in six CREMAs to implement ‘best practices’ for collecting and processing shea kernels to meet international standards established and agreed upon by the GSA. In Year 2, AgNRM trained 1,224 BVC and 800 WBC shea collectors on how to ensure consistent and high-quality processing of shea kernels. A number of shea collectors in the CREMA communities admitted that before the training, they did not remove germinated and rotten shea kernels, sticks, stones and other debris from the fruit before processing the kernels, which leads to an inferior product.

AgNRM also introduced shea collector/producer groups to the steps required to attain organic certification and outlined the benefits of becoming certified. The requirements for organic certification correspond well with the goals and objectives of the CREMA approach with respect to its focus on enhancing ecosystem services, promoting sustainable natural resource management and supporting farmer managed natural regeneration of indigenous tree species.

To improve CREMA residents' knowledge on shea propagation techniques, AgNRM organized an exposure visit to CRIG for 100 shea collectors/processors from Wechiau, Zukpiri and Dorimon CREMAs in Q2. After the visit to CRIG, AgNRM began implementing several activities aimed at increasing the quantity of shea kernels produced in the targeted CREMAs, as supply consistently falls short of the annual demand for shea. AgNRM began implementing three activities in FY 2017: 1) produce and plant more shea trees in the degraded shea parklands; 2) implement improved propagation techniques; and 3) facilitate pollination by supporting bee keeping; all of which will continue in FY 2018.

In FY 2017, the AgNRM project worked with the BVC CREMAs to install 10 beehives in each of the five communities selected for the activity; in addition, the CREMA activity coordinator received five beehives to manage. Prior to installing the beehives, the project team trained a total of 230 people (48 males, 230 females) on beekeeping and apiary management. AgNRM's nascent beekeeping activity is aimed at improving shea pollination, as well as diversifying household incomes from NRPs.

AgNRM introduced shea processors in the BVC CREMAs to InStove's highly efficient cook stove. Some of the processors in Wechiau's shea processing center remarked that, if not for the introduction of these clean cook stoves, they were considering quitting shea processing because of the smoke they inhale from the traditional cook stoves. InStove donated 20 cook stoves to AgNRM, which arrived in Ghana at the close of Year 2. The stoves, to be distributed to collector/processor groups in the BVC and WBC CREMAs, will contribute to reducing fire wood consumption by more than 60%, reduce carbon emissions and reduce the negative impact of smoke particulates on the health of shea processors. AgNRM also collaborated with the U.S.-based Burn Design Lab to explore improved designs for the shea kernel roasters.

As the 2017 shea season got under way, AgNRM, in collaboration with GSA, facilitated ten market linkage meetings between CREMA representatives and ten end market shea buyers. The CREMA representatives learned first-hand how to research and negotiate the best terms for their shea sales. The buyers included AAK, IOI Loders Crocklaan, Fuji Oils, Wilmar, Naasakle, Nuts for Growth and Tungteeya. With the notable exception of the Wechiau CREMA, which has a long-standing market relationship with SFC for the supply of organic shea kernel, the CREMA representatives of the five CREMAs led the discussions in all the sessions. At the end of the of deliberations, the five CREMAs unanimously agreed to sell their shea harvest to Wilmar for three reasons: 1) Wilmar has three centers (Wa, Tamale, and Tema) where the shea can be delivered; 2) payment is made within 24 hours of inspection, either by cash or check; and 3) Wilmar will issue Vendor Code to each CREMA, thus enabling them to sell directly to the firm in the future.

## Outcome 2 – Improved food and nutritional security

Farm families in AgNRM's ZOI face multiple challenges in attaining nutritional security. These include erratic rainfall, weathered soils with poor structure and low fertility, degraded land cover and destructive pests. Furthermore, many smallholder farmers in AgNRM's targeted landscapes are marginal players in the formal agriculture sector. This is particularly true for women. In Year 2, AgNRM assisted farmers to address some of these threats through the of CSA practices that increase both water and plant nutrient-use efficiencies. AgNRM is strengthening VSLAs so women can access loans to start small enterprises and adopt a culture of savings – thus improving their resilience by enabling them to better respond to crises and the need for cash. In Year 2, AgNRM engaged with other FtF projects to promote activities that address the food security and nutrition challenges many households face.

Some of the major key achievements in Year 2 included training a total of 2,414 (505 men and 1,909 women) CREMA community members in CSA practices, including integrated soil fertility management, integrated pest management, agriculture water management, and improved seed varieties. AgNRM supported a total of 104 VSLAs (27 new and 73 existing groups in BVC and 4

new groups in WBC), with a total membership of 2,580 individuals; who were trained on VSLA governance, fund management and investment options, adopting a nine-module curriculum originally developed by Care International.

## 2.1 Intensified and diversified climate smart technologies for production

Promote conservation agriculture (CA) alongside indigenous crops and livestock

In FY 2017, the AgNRM team focused on transferring knowledge and demonstrating the benefits of CA and CSA to increase productivity, efficiency and adaptive capacity. AgNRM developed and administered a short survey on CSA technologies to key stakeholders, who indicated that they were most interested in incorporating improved seed varieties, minimum tillage/ripping, water harvesting techniques and improved soil fertility practices into their farming systems. As a result, AgNRM promoted the following CSA interventions to address low soil fertility, low soil moisture and declining crop yields:

- 1) Use of improved, drought tolerant seeds
- 2) Use of organic fertilizers, such as compost and livestock manure
- 3) Field preparation using oxen-drawn rippers
- 4) Zai pit construction
- 5) Mulching

AgNRM sponsored 18 members (9 men and 9 women) from the three BVC CREMAs to participate in the sixth Annual Pre-Harvest Event in October 2016, organized by USAID's ADVANCE II project. This provided an opportunity for CREMA members to learn about CSA technologies and engage with business and industry actors. AgNRM also hosted a Climate Smart Agriculture Forum in Wa on June 1, 2017, with the theme "Achieving Sustainable Development through Climate Smart Agriculture." The CSA forum brought together 371 stakeholders including 300 farmers, GoG agencies, paramount and divisional chiefs from AgNRM's targeted CREMAs and other USAID implementing partners.

Many farmers in the targeted communities learned about CSA from AgNRM-organized informational videos and on-farm visits. AgNRM's primary strategy was to expose beneficiary farmers to CSA practices at the farm level. AgNRM established 40 demonstration sites (28 in the BVC and 12 in the

### CREMA COMMUNITY MEMBERS ADOPT CLIMATE SMART AGRICULTURE TECHNIQUES



CREMA community members learned about Climate Smart Agriculture by working in and visiting AgNRM's demonstration fields in FY 2017.



WBC) featuring early maturing varieties of maize (Abontem) and soybean (Afayak). Abontem is a climate smart early maturing, open pollinated variety of maize rich in Vitamin A with average yield of 4-5Mt/ha. It matures within 90 days after emergence. Afayak is a high yielding variety, rich in protein with little shattering at maturity. Due to the great interest in both Abontem and Afayak, AgNRM supported 15 women's groups with improved seeds to grow Afayak soybeans and an additional six women's groups to grow the Vitamin A rich maize.

During the land demarcation exercises, the AgNRM team observed that many of the parcels given to women are of marginal quality and cannot support crop cultivation unless soil health is improved. Few women can afford fertilizer and soil amendments to enrich the soil. AgNRM therefore trained women to use organic materials they can obtain locally to improve the soil's health and water retention capabilities. Compost making, which uses animal manure as one of the ingredients, was used as an entry point to improve soil fertility and soil health for increased crop yields. One participant commented: *"Before the training, we did not appreciate the use of animal manure and compost as we saw this as a lot of work but now we will make and use our own compost."* The women were also trained on the zai pit technology for soil moisture management and concentrating soil nutrients for crop production. As a result, women have begun constructing zai pits before planting moringa seeds, thereby improving plant growth.

Many CREMA community members rear livestock, especially small ruminants, on a small scale to help meet household economic needs; livestock provide an especially important safety net for families in the dry season, when food production is extremely low. The lack of extension services and animal health services in many of AgNRM's targeted communities leads to regular disease outbreaks, which cause high mortality especially of small ruminants and poultry. To enhance livestock productivity, AgNRM, in collaboration with the Upper West Region's Veterinary Service Department, trained a total of 224 livestock owners comprising 77 men and 147 women from 13 communities. During the sessions, participants, learned about the availability of veterinary technician services and the importance of interacting regularly with the veterinary extension agent assigned to their district. Training participants also learned about the importance of supplementary feedings and well-ventilated housing units.

#### Promoting dry season gardening

Dry season gardening is a critical way of ensuring that families obtain green leafy vegetables during the dry season. To demonstrate this, AgNRM established a dry season garden on an acre of land in Dorimon. Water conservation technologies such as basins, zai pits and mulching were practiced in this garden. While the dry season demonstration garden was successful, it was started late in the season and women were not able to scale it up due to lack of water; issues the project will address in AgNRM's Year 3 dry season demonstration gardens.

Sixty-five (63) women were trained on constructing zai pits and basins and encouraged to use these practices in their backyard gardens. The dry season garden demonstration plot enabled women to produce fresh vegetables, including bean and pumpkin leaves, okro, hibiscus and amaranth for their household needs for the first time during the dry season. The women's bean leaf harvest had an estimated monetary value of \$467 (Ghc 2,100), 75% of which was divided among the participants and consumed at home, while 25% or \$122 (Ghc 525) was sold as surplus. The women's okra harvest had an estimated value of \$477 (Ghc 1,920), 50% of which they consumed and half was sold. In a cooking demonstration on vegetable utilization, one of the farmers remarked: *"the fact that AgNRM has supported us to be productive in the dry season is something we can never forget."* The production of green leafy vegetables in the dry season using CSA practices was an eye opener for the Dorimon women and they look forward to applying their knowledge in their home gardens next season.

AgNRM's training on the filtration and use of grey water for watering home gardens in the dry season also created excitement among the women in Dorimon. The technology involves the use of fine sand, neem leaves, moringa seeds and plastic water bottles to make a simple but effective filter; the filtered water is suitable for home garden cultivation.

### Support agroforestry systems

As part of the climate smart strategies, AgNRM promoted alley cropping, whereby moringa is intercropped between maize and soy bean rows, in all the BVC and WBC demonstration fields. Moringa is not only a valuable NRP, but also enhances soil fertility. AgNRM introduced live fencing to protect the moringa plantations against livestock. AgNRM encouraged farmers to plant live fences rather than cutting wood to construct fencing for their home gardens. Some of the varieties of vegetation used in live fencing have the added benefit of fixing nitrogen.

### Develop productive water management technologies and systems

AgNRM conducted a two-week training of project staff on Multiple-Use Water Services (MUS) in FY 2017/Q3. The training included an overview of MUS, a holistic approach to considering all water needs of a community – from domestic to productive uses. Following the training, AgNRM team members started to apply the assessment techniques, such as community mapping, water source surveying and focus group discussions. The new skills enable the AgNRM team to assess water needs throughout the target CREMAs and to identify sustainable solutions and improvements to water access. The training paves the way for the team to replicate MUS assessments and interventions in many communities across all target CREMAs in FY 2018.

## *2.2 Strengthened capacities for modifications to existing livelihoods and improved nutrition*

### Improve access to finance and promote time and labor-saving technologies for women

Since the project's inception, AgNRM has raised awareness on the importance of savings and investment to improve a household's ability to withstand economic, social and climatic shocks. In Year 2, AgNRM explored the options available to NRP groups to access financing for their NRP activities and enterprises.<sup>5</sup> Considering the isolated nature of many of the targeted communities, access to mainstream financial services is very limited; thus, VSLAs were identified as the most appropriate and reliable way to improve people's access to financial services. VSLAs are an effective mechanism by which micro-businesses in AgNRM's targeted CREMAs can access flexible start-up capital to grow their enterprises.

In AgNRM targeted communities, VSLAs serve as a platform from which an NRP collector group is formed or an existing collector/processor group can access capital to grow their enterprises. RING shared with AgNRM a set of VSLA training and management tools. In Year 2 AgNRM trained VSLA members on good practice principles and equipped each association with a start-up kit comprising of a metal savings box, member passbooks, a calculator, notebooks, stamp pad, a money collection bowl, rulers, and pens. With the provision of these basic supplies, new skills, and improved accounting systems, the members now have confidence in their ability to manage their shared funds.

AgNRM identified and profiled a total of 123 NRP producer groups in the BVC that could benefit from VSLA training. Many of the trainees from existing VSLAs expressed a renewed interest in their VSLAs and 15 of them immediately increased their weekly savings "share" from \$0.50 (Ghc 2) to \$1.20 (Ghc 5). Some of the members invested their savings into stockpiling shea nuts, while others invested in the processing of moringa based products AgNRM had trained them to produce. All VSLAs have been registered using the online Savings Groups Information Exchange or SAVIX platform.

### Coordinate with community health centers to promote better nutrition

In FY 2017, AgNRM widely promoted the cultivation and consumption of OFSP to bolster household consumption of Vitamin A rich foods and add to their nutritional diversity. The OFSP is highly nutritious and has clear health benefits for pregnant women, nursing mothers and young children. AgNRM introduced CREMA communities to the OFSP through a sensitization program.

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<sup>5</sup> Value Chain Financing Arrangements and Options for some Selected Natural Resource Products (NRPs) in Community Resource Management Areas (CREMAs) of Northern Ghana

The project received strong support from USAID RING, which provided almost 200,000 seed vines to AgNRM. This enabled AgNRM to work with 94 groups (44 in the WBC and 50 in the BVC), with a total membership of 2,493 across six CREMAs to cultivate OFSP during the 2017 rainy season. The AgNRM project originally planned to only distribute 100,000 vines, but the project's sensitization and training sessions on the uses of OSFP created a huge demand. As a result, the team quickly acquired almost double the vines, which were planted on approximately 9.6 hectares (23.75 acres) of land. The targeted groups were given on-farm training on land preparation/planting and field care/management practices.

During the dry season garden activity in the Dorimon CREMA, AgNRM trained 50 women on the nutritional value of the vegetables they produced and the importance of these vegetables for household health and well-being. The women learned how to prepare dishes using the dry season garden vegetables and OFSP. The AgNRM team also trained community members on the health and nutritional benefits of moringa leaves in the three WBC CREMAs (Builsa Yening, SKGK, and MWK), as well as in the BVC, and encouraged both increased moringa production and consumption – especially for children. Follow-up visits in the BVC revealed that 30% of the participants now add moringa to their meals, especially to T.Z., the major staple food in the region. Jeriwana Jabia, of Kantu community, exclaimed: *“I now add moringa to the tom brown I cook for my family, and I regularly add moringa to T.Z., rice and porridge. I really appreciate the training! It was truly an eye opener.”*

To promote better household nutrition more broadly, AgNRM collaborated with a number of GoG agencies that work on nutrition related issues. Working together with staff from the relevant government agencies – Ghana Health Services, Ghana Education Services, Environmental Health and MOFA, the integrated team organized a session in SKGK that involved 178 community members (68 men, 110 women). AgNRM's objective was to reinforce the importance of good nutrition and to encourage community leaders to fight against all forms of malnutrition.

### Outcome 3 – Increased security of farmers and communities seeking access and rights to land and natural resources

In Year 2 AgNRM focused on strengthening women's access to land and natural resources by working closely with traditional authorities to obtain their support and involve them in the process from the beginning. AgNRM's training negotiation skills and on their legal rights strengthened the capacity of the women beneficiaries to negotiate for secure land access. The project team produced a tenure security document on land tenure outlining interventions that have the potential to change the narrative of women and vulnerable group's access and use rights. The team also trained CREMA executives and women leaders on

### CREMA COMMUNITY MEMBERS ENTHUSIASTICALLY CULTIVATE ORANGE FLESH SWEET POTATOES



AgNRM provided training and 200,000 orange flesh sweet potato seed vines to 2,493 people in six targeted CREMAs, to bolster household consumption of Vitamin A and improve household nutrition.

conflict analysis and resolution and designed an early warning and early response system for natural resource based conflicts. This suite of training focuses on building robust community structures with increased equality and improved ability to respond to conflicts and maintain peace.

### *3.1 Strengthening women's access and rights to land and natural resources*

The AgNRM team completed a desk review and field assessment on land access and rights in the six CREMA sites focusing on women and vulnerable groups early in Year 2. The desk review compiled previous studies on these issues, while the field assessment identified targeted interventions to improve women and other vulnerable group's land tenure security. The report, *Land Tenure and Natural Resource Access Issues Related to Women in Northern Ghana*, was validated in two fora held in Wa and Navrongo in Q3, and finalized in Q4 after incorporating key stakeholder input.

AgNRM helped hundreds of community members demarcate 335 parcels of land covering 420.74 acres (170.25 hectares), including home gardens, agricultural fields and uncultivated land. The demarcations took place in the Zukpiri, Dorimon, Builsa Yening and MWK CREMAs. The land demarcation exercise brings more than 200 women settlers one step closer to obtaining increased tenure security over parcels they farm. The next and final step in the process is to formalize the negotiated agreements by having all relevant parties sign written land use agreements.



**Photo 2. Women map their community resources during an AgNRM MUS training**

AgNRM achieved the quick uptake of negotiating secure land use agreements by working closely with traditional authorities and interweaving local practices with Ghana's current laws and policies. The team worked with traditional land authorities to solicit their knowledge and understanding of resource access and use rights to develop locally acceptable resource tenure options for women and other vulnerable groups. The AgNRM team also worked closely with the

Land Commission, Town and Country Planning, Northern Ghana Governance Activity, Customary Land Secretariat, West, Kasena-Nakana East, Builsa South and Mamprugu-Moaduri District Assemblies in negotiating access to and demarcation of land.

Women trained in Interest Based Negotiations (IBN) in Year 2 applied their newly acquired knowledge and skills to self-advocate for and broker better resource access arrangements. AgNRM guided women through engagement and negotiation sessions with traditional leaders and land owners prior to demarcating land plots. A major achievement of the IBN training was the successful negotiation of 60-acres of land by women in Dabozesi (MWK CREMA) for moringa cultivation.

In Year 2, AgNRM identified "Male Allies of Women's Rights." The selected men demonstrate leadership in supporting women's rights in the CREMA communities. Many of these men have given their own land to women to use for productive purposes and have been supportive of AgNRM's land demarcation work in their communities. The women in Dabozesi who negotiated rights to more than 60 acres of land did so with the support of several "Male Allies". By the end of Year 2, women across

AgNRM's six targeted CREMAs had begun negotiations with traditional landholders, with support from the male allies, using their new legal knowledge and negotiation skills.

### 3.2 Develop clear land boundaries for project interventions to avoid conflict

A preliminary conflict analysis and risk assessment of CREMA communities in AgNRM's targeted landscapes revealed potential conflict areas as shown below. In Year 2, AgNRM monitored these situations, trained CREMA executives to address these and other conflict issues and put in place an early warning mechanism to manage such risks. AgNRM is also closely monitoring farmer-pastoralist issues that regularly crop up in the CREMAs to establish mechanisms to prevent and address conflicts.

**Table 3: CREMA Community Risk Matrix**

CREMA Site	Community	Indicators	Risk Level
MWK	Yeizesi	Boundary dispute with Weisi community Unresolved chieftaincy dispute	High
Builsa Yening	Wiesi	Boundary dispute with Yeizesi	Low
SKGK	Yendao	Boundary dispute with the Kayoro	Low
Wechiau	Dochere	Dispute over land and cashew plantation	Medium

## Outcome 4 – Environmental stewardship strengthened

### 4.1 Improved management and conservation of select CREMAs and biodiversity corridors in the Volta Basin

AgNRM drafted Memorandum of Understanding (MoU) with each of the beneficiary CREMAs in the BVC and WBC, of which four out of six were signed before September 30, 2017. The project team engaged and consulted chiefs, landowners (*tindaanas*), CREMA executives, youth groups, queen mothers and *magazias*, as well as local government representatives in each targeted CREMA. The MoUs detail provisions and responsibilities of the collaboration between the project and the CREMA, providing the CREMA with an assurance of AgNRM and other partners' commitment and support. Due to this participatory process, CREMA representatives are fully informed of their roles and responsibilities. The participants enthusiastically support this active engagement. For instance, the chief of Sirru and chairman of the Zukpiri CREMA, Naa Dakura Bapakrannige I, expressed his gratitude to USAID and thanked the AgNRM team for their patience in taking them through the MoU processes and pledged the CREMA's support for its successful implementation. Niamatu Braimah, one of the female CEC members from MWK CREMA, remarked "*we are grateful to USAID for the intervention and I urge all women to embrace the project because it is going to help us tremendously*". She continued "*This project is a divine intervention for women in the rural areas because it will help us not only to conserve our environment but also provide us with sustainable sources for our livelihoods.*" In the workshop for the Builsa Yening CREMA, Moses Abawire, the chairman of the Builsa Yening CREMA also remarked "*indeed, the project presents an opportunity for communities in the CREMA to conserve and sustainably use their natural resources.*" At SKGK, the Chairman of SKGK CREMA, Mohammed Adams, said "*We have just expelled a member of the CEC and are advocating for his prosecution because he facilitated the illegal harvesting of rosewood in the CREMA. This is just one of the ways of demonstrating our resolve to protect our CREMAs. We are grateful the project will complement our efforts to conserve the environment as well as empower us economically.*"

In Year 2, AgNRM drafted a CREMA institutional capacity assessment tool that the team will roll out in Year 3. The tool will allow CECs to complete self-evaluations of their strengths and weaknesses, and guide AgNRM and CREMA management in tailoring annual capacity building plans. The institutional capacity assessment will help improve each CREMA's overall performance and viability

by identifying key areas for improvement to achieve more effective management. Information from these assessments will also help the project team in planning and prioritizing project interventions based on each CREMA's needs.

Beginning in Q2, AgNRM engaged with key GoG collaborators and community leaders in the EBC. AgNRM conducted meetings throughout the selection process to ensure that areas of collaboration were identified and synergies with the FC's program for the EBC were established prior to actual interventions in the corridor. AgNRM also conducted a socio-economic assessment of the EBC, which examined the prevailing socio-economic, institutional and environmental conditions in the corridor to help AgNRM determine the best approach and most important interventions to pursue in the landscape. Significantly, the assessment revealed a year-round presence of elephants in some areas in the northern section of the corridor, demonstrating the corridor remains a high conservation value area and critical for Ghana's biodiversity, even though the assessment also provided ample evidence of rampant illegal rosewood harvesting and mining throughout the corridor. Following the socio-economic assessment, the project team held consultative meetings with prominent chiefs and community leaders to discuss project plans for supporting community initiatives on CREMA formation in the EBC.

Based on the report, AgNRM organized a workshop in Bolgatanga for 67 key stakeholders in the EBC on August 3, 2017 to share the results of the assessment to solicit input on AgNRM's pathway forward in the corridor. Some of the key stakeholders included paramount chiefs, WD, MOFA, WRC, the Minerals Commission, Fire Service and District Assembly representatives. During one discussion session, the chiefs lamented the increase in environment degradation in the area and pledged to allocate some of their lands to create buffer zones and riparian forest zones, and to motivate their populations to refrain from farming in the forest reserves. The chiefs also pledged to institute collective actions to stop the illegal exploitation of minerals and rosewood in forest reserves along the Red Volta river. The Bonaba, paramount chief of Bongo traditional area, remarked *"there have been many workshops and talks about developing the area but with very little commitment. However, we see the AgNRM project as a credible opportunity not only to stop the environmental degradation in our chiefdoms but to empower our people economically."*

In the first half of Year 2, the project team completed CREMA-level profiles in the three WBC CREMAs – SKGK, Builsa Yening and MWK. Information was gathered about each CREMA, including its stage of development, traditional and political structures and systems, the main economic activities and markets and existing (or historical) conservation values and traditional beliefs that underpin natural resource management. CREMA community members shared information, knowledge and experiences; for example, at SKGK, men and women from Kayoro, Nakong and Banu expressed concern regarding significant wildlife poaching, presence of herders and lack of dry season water holes. The information collected allowed the AgNRM team to identify important areas of intervention with each CREMA.

Throughout FY 2017, leaders and CEC members of the Dorimon, SKGK and Builsa Yening CREMAs worked with the AgNRM project to support the development of new and strengthening of existing Community Resource Management Committees (CRMCs). AgNRM strengthened the CRMCs by: 1) reviewing and reinforcing the roles and responsibilities of members, as well as suggesting improvements in the mode of operation; 2) encouraging women's participation in CRMCs; and 3) helping to resolve questions and confusion about CREMA membership. CRMCs function as the lowest level of CREMA governance (at the individual community level, with 7-9 members), and delegates from each member CRMC serve on the CEC.

In Dorimon, the AgNRM project worked in concert with the Traditional Council and Chiefs of the Dorimon CREMA area, its assembly members, and people from 32 communities to sensitize, implement and inaugurate its CRMCs, with approximately 10 members per CRMC (including at least 3 women per CRMC). Forming the CRMCs was the first formal step in building the CREMA

governance structure in the new Dorimon Paramountcy CREMA. In the SKGK and Builsa Yening CREMAs, representatives and leaders from 18 CRMCs, approximately one-third of which are women, worked with AgNRM to document and update their CRMC membership and to sensitize members on CRMC roles and responsibilities.

The AgNRM team supported leaders of the Dorimon CREMA to elect its CEC members before the end of FY 2017. Under the guidance of the Paramount Chief, the Assemblyman and the Queen Mother, five men and one woman were elected to the CEC. The CEC represents the highest level of CREMA governance and decision-making authority. The Dorimon CEC election was the final step in creating the Dorimon CREMA's governance structure, and enables the CREMA to enact its Constitution.

The WCHS and Dorimon CREMAs made significant progress in strengthening the foundation of their governance structures by revising and drafting their constitutions, respectively. The Dorimon CEC drafted and refined its constitution following a participatory and transparent process; the CEC has submitted their final draft to AgNRM for another review before voting on it. With AgNRM's technical support, WCHS CREMA revised its constitution for the first time in more than a decade, and CREMA leaders applauded the opportunity. In the revision process, WCHS added three communities - Sigiripari, Gojuyiri and Tuudouri to the CREMA, increasing the CREMA's constituency to 20 communities. In addition, and based on discussions with AgNRM's gender officer, the CEC voted to formally recognize the Queen Mothers as members of the CREMA leadership under a new article, Article XI, and changed the language to specify that both men and women should be represented on CRMCs.

Between November 2016 and July 2017, 49 representatives from the six BVC and WBC CREMAs (including 5 women) participated in three technical and biodiversity monitoring training sessions led and facilitated by experts from WD, the FC's Resource Management Support Centre and AgNRM project staff. During these classroom and field-based trainings, participants were taught natural resource management concepts, equipped with the skills to use monitoring equipment (GPS units, digital cameras and binoculars), introduced to biodiversity monitoring protocols and data collection practices and the collection and use of spatial data. Each BVC CREMA now has field personnel with the technical capacity to monitor biodiversity (including birds, hippos and ungulates) and the appreciation for the purpose and results of biodiversity monitoring.

Toward the end of the 2016 wet season (October 2016), WCHS CREMA added bird monitoring to their hippo monitoring as part of the semi-annual biomonitoring plan the CEC developed with AgNRM's technical guidance. This was followed by a 2017 dry season monitoring exercise during which the team collected data on birds and hippos from all three BVC CREMAs. This was the first time that Zukpiri and Dorimon CREMAs systematically monitored the hippo populations and species richness and diversity of birds within their core conservation zones. The 2017 wet season monitoring exercise was underway at the end of FY 2017. Biodiversity monitoring increases CREMA members and leaders' overall understanding of trends and changes in key wildlife populations, reinforces the underlying importance of CREMAs by documenting its conservation value, and increases the capacity of CREMA members in collecting key biological and ecological data over time.

In Year 1, Zukpiri CREMA communities and its core conservation zone boundaries were recorded, and Wechiau's external boundaries, communities and core conservation zone boundaries were delineated using GPS devices. In Year 2, work progressed in the Dorimon CREMA to record the GPS coordinates of the agreed Dorimon management zones (external boundaries and core conservation zone), after thorough discussions and negotiations that were led by the Paramount Chief and sub-chiefs, assembly members, the Queen Mother and other opinion leaders. Though boundary delineation exercises have the potential to lead to disagreement and/or conflict, the participants in Dorimon retained a remarkable openness and spirit of understanding and good-will, which speaks to a bright future for the CREMA.

In Year 2, the AgNRM drafted indigenous knowledge (IK) assessments for both the BV and WBC,<sup>6</sup> and a strategic planning document<sup>7</sup> for each of the corridors. AgNRM will finalize these documents early in Year 3; after which, much of the information from the two sets of studies will be integrated into CREMA-level management plans and shared with the public. The IK report provides information about natural resource traditional practices, conservation values and beliefs that could be instrumental to CREMA management. The IK fieldwork was conducted in six CREMA communities per basin and targeted individuals and focus groups using a set of IK tools and methods.

AgNRM supported the development of two documents that help WD develop the agency's strategic vision for the Western Biodiversity Corridor and the Black Volta Biodiversity Corridor. The WD will use the documents, still in draft form, to further develop their strategic planning for future CREMA development and corridor management. In the WBC, the WD's goal is to develop a global management plan for the entire corridor, that expands from the Mole National Park to the Nazinga Game Ranch in Burkina Faso and west to the Gbele Resource Reserve. The two reports will be finalized in the first half of Year 3.

#### *4.2 Ecosystem Services Improved*

In FY 2017, the focus of the work for this outcome was on the creation of the ecosystem services decision support tool (ESDST). The ESDST provides a valuation of ecosystem services and an economic appraisal of different land uses in northern Ghana and presents the appraisal in a manner that can be understood and used by CREMA and community members in their land use management planning process. By quantifying and giving value to the ecosystem services provided by land uses, such as natural forest, conventional agriculture and agroforestry, the ESDST allows land planners to fully understand the tradeoffs between these land uses as they make decisions.

The first step in the creation of the ESDST was to comprehensively identify the important ecosystem services provided in the landscape in northern Ghana. At the beginning of FY 2017, a stakeholder consultation workshop was organized in Tamale to present the findings of the ecosystem services background paper (completed in FY 2016) and receive input of key stakeholders on the key ecosystem services in their region. The workshop brought together representatives from key government institutions as well as experts from local universities and representatives from the six target CREMAs. The consensus through the workshops and the additional stakeholder consultation guided the subsequent formation of the ESDST and focused further work on the ecosystem services deemed most critical by the stakeholders.

A scientific analysis was then carried out to quantify the key ecosystem services on the major land uses and land use transitions in the region. Hydrological modeling was performed to analyze the major water-based ecosystem services including flood and erosion mitigation and groundwater recharge. Greenhouse gas emissions were analyzed using Intergovernmental Panel on Climate Change methodologies and local data obtained from governmental and academic sources. An economic analysis also was started in FY 2017, which takes advantage of local market data to determine the costs and revenues of each land use. The results of this analysis will be integrated into the ESDST using diagrams of each land use and ecosystem service indicator to indicate how the indicators change as one land use transitions to another.

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<sup>6</sup> Millar, D. (Draft). *Rapid assessment of indigenous knowledge from the Western Corridor CREMAs: Builsa Yening, Monduri-Wuntalori-Konsasi, Sangyega-Kassena-Gavara-Kara*. Agriculture and Natural Resource Management project, USAID Feed the Future; Millar, D. (Draft). *Rapid assessment of indigenous knowledge from Black Volta River Basin CREMAs: Dorimon, Wechiau, and Zukpiri*. Agriculture and Natural Resource Management project, USAID Feed the Future.

<sup>7</sup> Lungren, C. and Naada, J. (Draft). *Strategy for the Mole-Nazinga biodiversity corridor ("Western Corridor")*. Agriculture and Natural Resource Management project, USAID Feed the Future; Lungren, C. and Naada, J. (Draft). *Strategic Vision for the Black Volta Biodiversity Corridor and Community Resource Management Areas*. Agriculture and Natural Resource Management project, USAID Feed the Future.



In FY 2017|Q4, the AgNRM team made progress on the economic analysis to be included in the ESDST. Initial estimates of net present value of each included land use were made along with the costs and revenue of switching between different land uses with special emphasis on the major land use change scenarios included in the ESDST. A “steady-state” analysis was also added to show how different land uses provide ecosystem services independent of the effects of land use change. This analysis allows for comparison of the value of each land use in ecosystem service provision.

AgNRM has designed a tool, the Eco Game, to complement the ESDST. This game is based on the same ecosystem valuation analysis used to develop the ESDST, but it is interactive. The Eco Game allows land managers and decision makers to role play and understand the impacts of decisions on ecosystem services and the value of ecosystem services to communities. Over 30-45 minutes, the game simulates the economic and ecological consequences of land use management, so players can see how their land use decisions affect their economy, community resilience, and overall landscape health. Through this game, players will also learn to avoid negative management choices, adapt to a changing landscape and climate, and understand the importance of resiliency when managing the land.

The AgNRM team also advanced on developing an approach for accounting for carbon impacts across Ghana’s landscapes, focusing on the supply chains of AgNRM’s target natural resource products. This analysis will help identify the greatest sources of emissions and where opportunities lie to reduce emissions. This will help producers add value to their products through a marketing approach that highlights the sustainability and climate-friendly production processes of the natural resource products AgNRM is working to promote. An initial approach has been conceived that will map the value chains of a selection of natural resource products (e.g., shea, moringa, tamarind, dawadawa), including conventional production and transportation practices. In FY 2018, the following outputs will be developed (1) quantification of emissions associated with the production of these natural resource products; (2) identification of the greatest opportunities for emission reductions; and (3) marketing materials and scientific backing for highlighting climate impacts and sustainability of products to potential buyers.

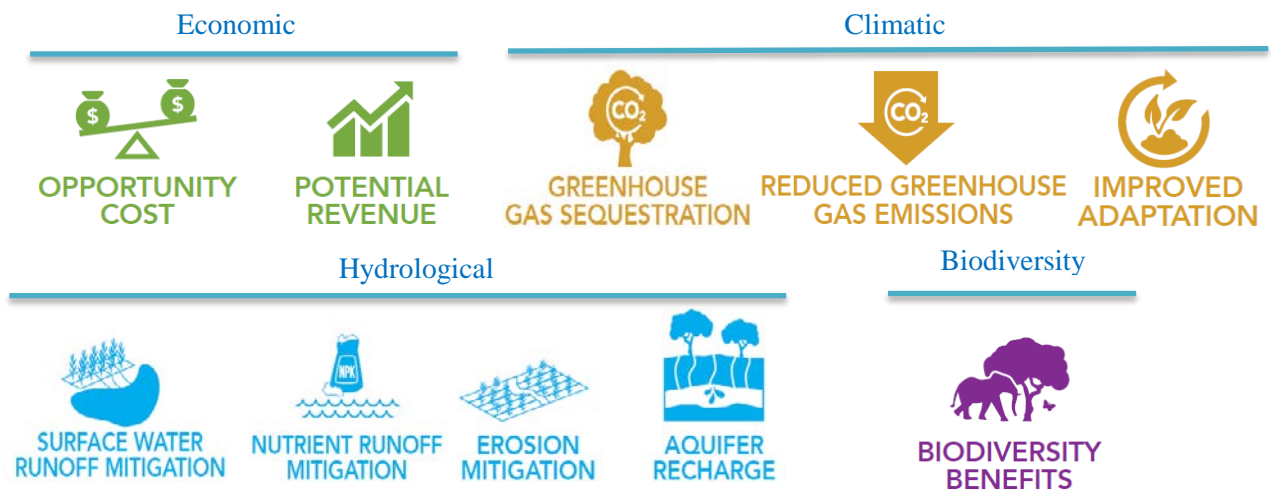


Figure 1. Indicators used to assess the value of economic, hydrological, climatic, and biodiversity ecosystem services in the ESDST

## 4. LESSONS LEARNED

- In Year 2, AgNRM recognized the need to increasingly direct gender and female empowerment messages specifically at men in the project’s targeted community, even though most project activities are targeted at women. Before the end of the reporting year, AgNRM had identified several approaches to reach more men, including aiming gender focused messages at the household level.
- Another lesson from the field has pointed to the importance of pairing economic empowerment activities for women with information and behavior change messaging about female empowerment, to inspire women’s interest and build confidence in the process.
- A key lesson learned was that CREMA farmers, especially in Wechiau and SKGK, were unwilling to use chemical fertilizers in their fields because they want to sell organic shea. This is despite the very low fertility of the soils in these areas. Going forward, AgNRM will work in close collaboration with CREMAs to determine what type of soil fertility interventions are appropriate and where. In areas where the focus is on organic shea, AgNRM will promote widespread and ‘best practice’ use of animal manure and compost to improve soil health to produce higher crop yields needed to meet household food and nutrition requirements.
- The AgNRM team learned that identifying and training Community Land Demarcation Volunteers was an effective approach for increasing community engagement and ownership of the land use negotiation process. In FY 2017, 45 community members, 30 men and 15 women, were trained to use GPS devices and other skills needed for land demarcation to serve as resources for further land demarcation throughout the life of the project and beyond. AgNRM encouraged CREMA and community-level executive committees to consider adding a Land Use Planning Committee to their governance structures to achieve greater sustainability of the activities. As part of the land demarcation exercise, AgNRM developed a comprehensive land database, which will be housed and managed within the targeted CREMAs.
- During Year 2, AgNRM began monitoring the relationship between farmers and pastoralists in the CREMAs more closely after the team realized with the view of engaging and initiating mechanisms to prevent conflicts. AgNRM will help to deploy an Early Warning and Early Response System to monitor and respond to farmer-pastoralist relations in Year 3.

## 5. EXPENDITURES FOR FY 2017 & FY 2018 Q1 PROJECTED EXPENDITURES\*

Budget Line Item	FY 2017 Expended	FY 2018 – Quarter I Projected			TOTAL FY 2018 Q1 (projected)
		Oct	Nov	Dec	
Direct	\$3,188,022	\$342,401	\$282,502	\$266,013	\$890,916
Indirect	\$774,623	\$74,919	\$81,890	\$77,623	\$234,432
<b>Total</b>	<b>\$3,962,645</b>	<b>\$417,320</b>	<b>\$364,392</b>	<b>\$343,636</b>	<b>\$1,125,348</b>

\*assumes requested funds are obligated

## 6. ANNEXES

## Annex A: FY 2017 Performance Indicator Matrix

FTF Ghana AgNRM Objective, Results and Indicators		FY2 Target	FY2 Achievement (Oct 2016 - Sept 2017)	% Achieved for FY2	LoP <sup>8</sup> Target	% of LoP Target Achieved	Deviation Narrative
<b>Goal: Poverty Reduction in Northern Ghana through sustainable increase and wealth and nutrition from natural and non-traditional agriculture products</b>							
1. EG.10.2-3 (Required)	Number of people with increased economic benefits derived from sustainable natural resource management and conservation as a result of USG assistance	1,000	1,221	122.10%	15,000	8%	The results of this indicator are based on data from AgNRM's survey work.
2. Custom	Number of households demonstrating improvement in score on resilience index	N/A	N/A	N/A	2,750	N/A	
<b>Outcome 1 Objective: Increased income from natural resource products</b>							
3. EG.5.2-1	Number of firms receiving USG-funded technical assistance for improving business performance	100	150	150.0%	700	21%	This indicator includes VSLAs (104), producer collector groups that have entered an agreement with an end-market shea buyer (16), the Wechiau CREMA (1), and moringa entrepreneurs (29).
4. Custom	Number of shea producer groups selling shea butter and kernels that meet international exporting standards as a result of USG assistance	0	N/A	N/A	150	N/A	
5. Custom	Number of individuals with increased income from targeted natural resource products (NRP) as a result of USG assistance	200	405	202.50%	4,000	10%	The results of this indicator are based on data from AgNRM's survey work.
6. Custom	Value of sales revenue received by MSMEs from natural resource products (NRP) as a result of USG assistance (\$'000)	\$193	\$201	104.15%	\$21,761	1%	
<b>Outcome 2 Objective: Improved food and nutritional security</b>							
7. Custom	Number of households with improved access to water	0	N/A	N/A	7,500	N/A	

<sup>8</sup> Life of Project

8. Custom	Number of people trained in child health and nutrition through USG-supported programs	500	1,983	396.6%	5,000	40%	The project introduced the utilization of moringa and orange flesh sweet potatoes in communities within six targeted CREMAs. The multiple uses of and value addition to these products for both home consumption and income generation are relatively new to people in the targeted locations. Hence trainings attracted large participation, exceeding the target for FY 2017.
<b>Outcome 3 Objective: Increased security of farmer access and use of community natural resources</b>							
9. EG.3.1-13	Number of households with formalized land with USG assistance.	250			4,000	0%	The project team identified three main steps required for land agreements to be formalized. The formalization process consists of: 1) identification and negotiation of the land plot, 2) development of a land plot map, and 3) formal agreement written and signed by the parties involved. The team was able to complete the first two stages by the end of FY 2017 and will accomplish the third and final stage, pending signature from local authorities, in the first half of FY 2018.
	<b>Stage 1:</b> Land identified and use/access rights negotiated		477				
	<b>Stage 2:</b> Development of land plot maps		251				
	<b>Stage 3:</b> Signing of Land Agreement		0				
10. Custom	Number of community land use plans proposed, adopted, or implemented as a result of USG assistance	0	N/A	N/A	150	N/A	
<b>Outcome 4 Objective: Strengthened environmental stewardship</b>							
11. 4.8-7 (Required)	Greenhouse gas (GHG) emissions, estimated in metric tons of Carbon Dioxide Equivalent (CO <sub>2</sub> e), reduced, sequestered and/or avoided as a result of USG assistance	227,000	173	0.1%	1,746,000	0.01%	The target for GHG emissions reductions was calculated prior to finalization of the CREMA boundaries and represented emissions reduction potential based on a much larger area. CREMA selection was finalized at the end of Year 2 and the indicator target will subsequently be updated to reflect emissions reduction potential in AgNRM's targeted areas. Furthermore, activities contributing to GHG emissions reductions in Year 2 are nascent, thus the team was conservative in its effectiveness ratings on forest protection activities. As AgNRM builds capacity on forest protection and fire prevention, effectiveness ratings will increase.
12. EG.10.2-2 (Required)	Number of hectares of biological significance areas under improved natural resources management as a result of USG assistance	N/A	N/A	N/A	250,000	N/A	
13. EG.10.2-1 (Required)	Number of hectares of biological significance areas showing improved biophysical conditions as a result of USG assistance	0	N/A	N/A	100,000	N/A	

Crosscutting Indicators							
14. EG.3.2-1 (Required)	Number of individuals who have received USG supported short-term agricultural sector or food security training	2,000	5,332	266.6%	15,000	36%	AgNRM engaged in a diverse group of trainings implemented across six targeted CREMAS. There was particular demand for training sessions on moringa utilization, shea quality improvements, orange flesh sweet potato, and composting. Due to sustained interest, AgNRM reached more people than originally anticipated.
15. EG.3.2-4 (Required)	Number of food security private enterprises (for profit), producer organizations, water user associations, women's groups, trade and business associations, and community based organizations (CBOs) receiving USG assistance	55	138	250.9%	210	66%	This indicator includes VSLAs (104), producer/collector groups that have demonstrated that they are acting as producer organizations (16), and community resource management committees (CRMCs) established in Dorimon (18).
16. EG.3.2-17 (Required)	Number of farmers and others who have applied improved technologies or management practices as a result of USG assistance	1,000	1,347	134.70%	10,500	13%	More beneficiaries than anticipated, as confirmed through AgNRM survey work, applied technologies or management practices learned through AgNRM training including cultural practices, conservation agriculture, and soil fertility.
17. EG.3.2-18 (Required)	Number of hectares under improved technologies or management practices as a result of USG assistance	2,250	1,942	86.31%	21,750	9%	The plot size where technologies were applied were smaller than anticipated, as confirmed in AgNRM's survey work.
18. EG.3.2-20 (Required)	Number of private enterprises, producer organizations, water user associations, women's groups, trade and business associations and community-based organizations (CBOs) that applied improved technologies or management practices as a result of USG assistance	39	104	266.67%	183	57%	This includes VSLAs applying the tools and management practices they have accessed through AgNRM.
19. Custom	Number of people trained in sensitization to trafficking in persons and child labor practices	600	693	115.50%	6,600	11%	The project team trained beneficiaries on trafficking in persons and child labor practices using five video episodes that highlight child labor activities in shea, fishing, farming, domestic activities and industry. The audiovisual nature of the training attracted large audience resulting in over 115% achievement of the FY 2017 target.
20. EG.11-6	Number of people using climate information or implementing risk-reducing actions to improve resilience to climate change as supported by USG assistance	0	N/A	N/A	6,000	N/A	

## Annex B: AgNRM Success Stories

“My husband and I have since seen many benefits and we are very grateful for this support.”  
- Alima Sulemana, land holder



## Land tenure security for women inspires sustainable gardening practices

### Alima sets herself apart from the crowd

*“I am grateful to USAID AgNRM for teaching my community about land tenure security for women. Without them I would never have discovered my abilities in sustainable household gardening; I would never have imagined planting moringa trees and using my newly-learned techniques for improving soil fertility and fighting pest infestations in my garden.”- Alima Sulemana*

Alima Sulemana, a married mother of five, had a simple dream: to grow a small vegetable garden behind her house in Dorimon, in the Wa West district of Ghana’s Upper West region. Though she received support from the Sumbula Village Savings and Loan Association, which conducts various activities to improve members’ incomes, she wanted more – improved nutrition for her family and a little extra money from selling produce. However, she found herself facing a larger challenge. As a woman, Alima had little to no control over the land behind her house, making investing time and effort into a vegetable garden unappealing.

Land security is a huge challenge for women like Alima across northern Ghana – especially in rural communities where the value of land is tied to agricultural productivity. In the Upper West region, women play an important role in the agricultural sector and are generally recognized as the main producers and processors of agricultural produce, both for household consumption and livelihood purposes. But despite their enormous contributions, women earn minimal incomes because they have limited access to and control over the land. This lack of tenure and income security affects long term investments both in the land itself and in perennial crops, holding women like Alima back



But in October 2016, Alima became a beneficiary of the USAID-funded Feed the Future Ghana Agriculture and Natural Resource Management (AgNRM) project. AgNRM works to secure land tenure rights for women and vulnerable groups through negotiation and respect for local norms. Through this USAID support and collaboration with the Dorimon Traditional Council, Alima successfully obtained her own land from her husband, which she now uses for home gardening. Having secured her tenure rights, Alima now dictates what crops grow on her land, with little interference from her husband or relatives.

“I was unaware of a lot of things about home gardening,” Alima says. “Now I have a garden where I grow okra, pepper, pumpkin leaves, eggplant, and moringa trees.”

To ensure her plants grow well, Alima is applying knowledge and skills she gained through AgNRM trainings. In modified zai pits, she adds the compost she makes from a mixture of kitchen waste, animal droppings, ash, and neem leaves to improve soil fertility. She also filters used household water and uses it to water the garden, especially during the dry season.

“Before receiving AgNRM’s support, my husband would at times take over the land for no specific reason. As a result, the land could lie idle for months,” Alima says. “AgNRM explained to my husband the benefits of allowing me to have control of the land and put it into productive use, and he agreed. My husband and I have since seen many benefits and we are very grateful for this support.”

The garden has allowed Alima to diversify her family’s diet, providing them with more meal choices and health benefits. By eating more vegetables, the family has even reduced their spending at the local health clinic, since they don’t fall ill very often.

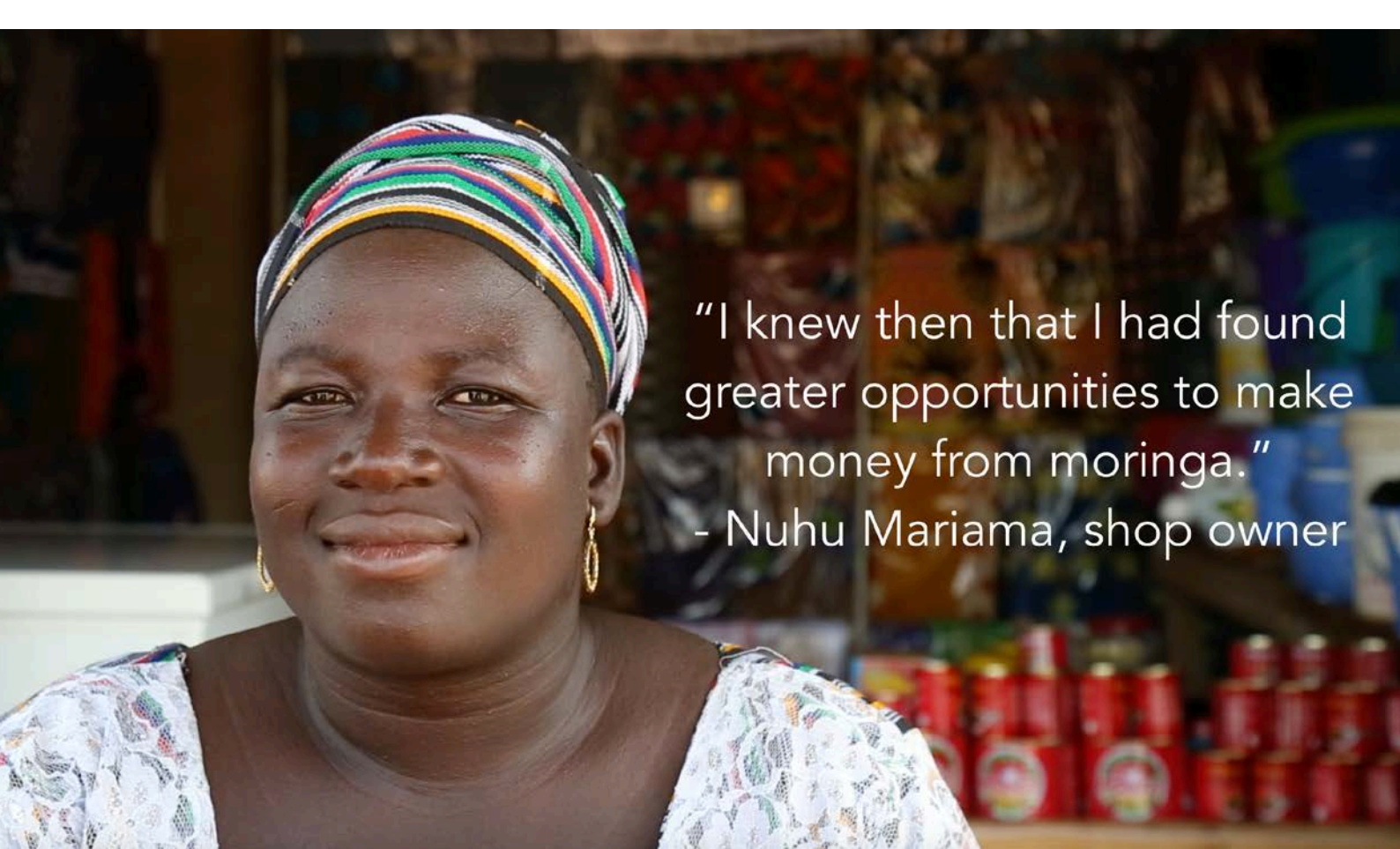
“Previously, we only ate vegetables if we had the money to buy them. But now we can get the vegetables from our home garden we grow ourselves and make choices on what to eat,” she says. “Thanks to USAID, I am now supporting my husband to improve our household’s nutrition and ensure a healthier family life.”

And the garden’s benefits go beyond health. Alima sells fresh moringa leaves and other vegetables from her garden, helping to reduce the family’s economic burden. By using entirely local inputs on farm land management, Alima has also avoided the cost of inorganic fertilizer and pesticides. This additional steady stream of income has enabled her to buy school supplies for her daughters, as well as food and other household items.

Having benefited so much from AgNRM’s work, Alima has become a champion for land tenure rights and improved techniques for home gardening in her community. She is determined to share her experiences with other households, particularly women. So far, she knows of three women in Dorimon who are putting into practice techniques she taught them.

Alima’s husband Sulemana has been supportive and encouraging. He helps her take care of the garden even as he works on the family’s maize and millet fields farther away from home. Alima describes her husband as an honest and hardworking man who takes pride in caring for household needs and who equally recognizes his wife’s support.

The more women and families like Alima and her husband are empowered, communities in rural Ghana will see a vast improvement in health, land security and economic resilience.



“I knew then that I had found greater opportunities to make money from moringa.”  
- Nuhu Mariama, shop owner

## Moringa processing diversifies income sources for women entrepreneurs

Until recently, 45-year-old Nuhu Mariama, a resident of Dorimon, Ghana, had only used moringa leaves for cooking and eating. Like many people in rural communities, she had little to no knowledge about the potential of this “magic tree.” But moringa products are growing in popularity within both local and international markets because of their medicinal and cosmetic values, as well as their nutritional ones. Thanks to the United States Agency for International Development (USAID)-funded Feed the Future Ghana Agriculture and Natural Resource Management (AgNRM) project, Mariama has participated in several moringa diversification trainings, resulting in increased income and better health.

USAID AgNRM supports sustainable economic development and rural livelihoods and strengthens natural resource management in northern Ghana. Project beneficiaries like Mariama have received training on moringa’s nutritional value and product production opportunities, learning how to process moringa into tea, oil, infant feed and cosmetics.

Mariama describes her first practical training: “The AgNRM team assembled us in the chief’s palace, and arranged us into groups based on different products. One group was instructed to pound the seeds and boil them until oil was produced; another group ripped and pounded the leaves, then added shea butter and fragrance to produce pomade, soap and ointment. I was surprised seeing the products for the first time.”

Within two months of the initial AgNRM training, Mariama felt confident in her ability to produce and sell moringa products. Her biggest challenge was securing the necessary start-up capital, but after a few sales, she gradually increased her production and expanded her opportunities by selling in the local weekly markets near her home. Today she sells her

products in community marketplaces. Mariama’s strategy quickly paid off, and she has already acquired a supply point in Wa, the Upper West regional capital, after just two months in business.

Mariama also embraced the opportunity to join eleven fellow female beneficiaries to travel to Tamale to participate in a national trade fair. She said the fair taught her how to market her products better and exposed her to other business initiatives in the processing of natural resource products, like air fresheners made from shea butter.

“For my products, I made sales of about GHc180.00,” (US \$41.00) she says. “It was an eye-opener and I thank AgNRM for the opportunity.”

Mariama assures her clients that her high-quality moringa products really do work; she tests them herself. She explains that she once used her moringa ointment on a fast-spreading skin rash – both on herself and her child.

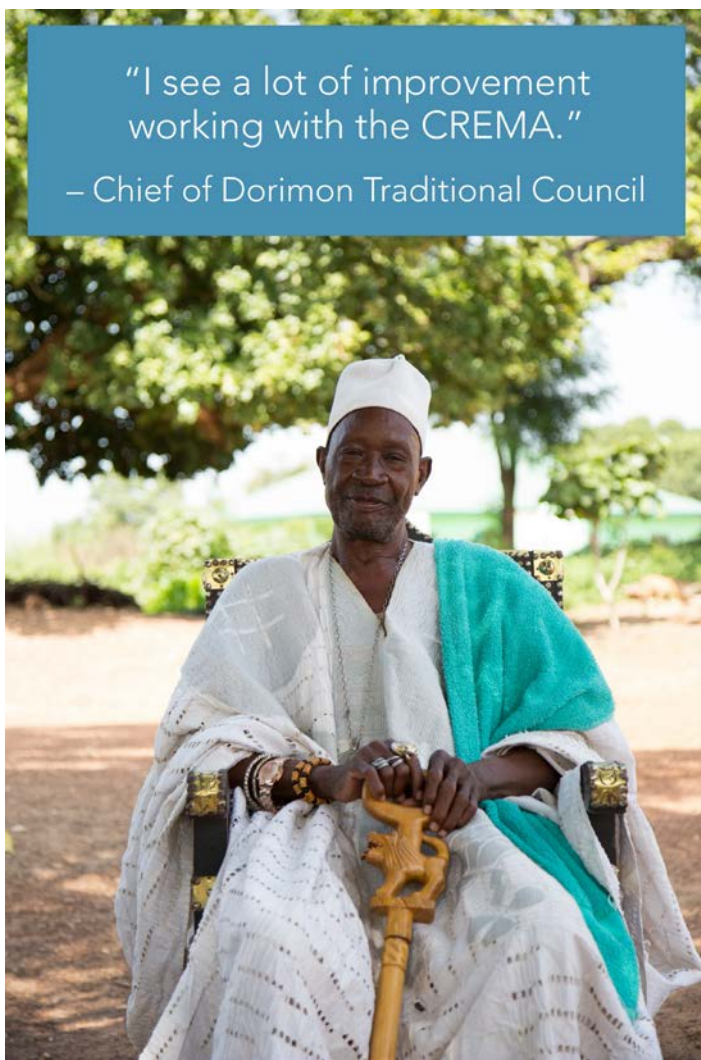
“My skin rashes disappeared within a week,” she says. “I could not believe it. I knew then that I had found greater opportunities to make money from moringa.”

As a mother of five, Mariama previously struggled to contribute to the family’s income and keep her family healthy at the same time. Now, with a growing customer base, Mariama hopes to expand her business in the future. Already an entrepreneur, she has owned her own thriving store for several years. She also belongs to Tiehinye Village Savings and Loan Association (VSLA), a micro-finance management group supported by the AgNRM project in the Dorimon Community Resource Management Area. With the VSLA initiative, she contributes weekly to her savings account from her business proceeds.

“I thank AgNRM for this opportunity to generate income and support my family in general,” she said.

By spreading awareness of the nutritional and economic values of moringa, the USAID AgNRM project is contributing to improved livelihoods and ensuring food security among women in rural communities across northern Ghana.

“I see a lot of improvement working with the CREMA.”  
– Chief of Dorimon Traditional Council



## COMMUNITY NATURAL RESOURCE CONSERVATION EFFORTS YIELD RESULTS FOR THE PEOPLE OF DORIMON PARAMOUNTCY

### Local communities have high hopes for a new approach to natural resource management

For centuries, communities across northern Ghana have depended on natural resources like shea and dawadawa for their livelihoods. While local resource governance systems led by chiefs and land priests once ensured sustainable use and protection of the environment, modernization, religious diversity and increased demands on land and other natural resources have rendered many of these traditional measures less effective. The Community Resource Management Area (CREMA) approach to natural resources conservation and management not only complements government efforts, but also secures

local and external support for community-based initiatives. This method motivates and empowers local people to work across community boundaries and other barriers to jointly manage and share the benefits of sustainable natural resource management.

Since its inception in May 2016, the Feed the Future Ghana Agriculture and Natural Resource Management (AgNRM) project has worked with communities in the Dorimon Paramountcy to ascertain the interest of traditional leaders in forming a CREMA. AgNRM found a ready and willing partner in Dorimon, home of both the largest remaining hippo population in Ghana and a significant population of shea trees. Recognizing the value of these natural resources, traditional leaders and people from nearby communities had begun their own conservation efforts and climate-friendly activities even before the project's support.

“We have long had specific areas, plant and animal species within the landscape that are protected by traditional norms and practices,” explains newly-elected CREMA chairman Naa Ingah Mwiniseori II. “It is a taboo to encroach on a sacred groove, cut a shea tree or kill hippos and crocodiles, according to the rules made by the traditional council to protect these natural resources.”

But despite community efforts, the surrounding natural vegetation and riverine areas have been seriously degraded over the years, driving traditional authorities and community members to recognize the need for a new approach to natural resource management.

“What the community started was the development of a green belt along the Black Volta River,” says CREMA Secretary Olinaa Ababaasah, who is also the assemblyman for Dorimon. “But we were constrained because peoples' livelihoods, in terms of agricultural activities, depended so much on the area we want to protect. AgNRM intervened to provide us with livelihood opportunities and support us to develop new governance structures to help us protect and manage our natural resource base.”

AgNRM's support to local communities also helped them catch up with their neighbors in surrounding areas, as explained by CREMA patron Suhimwininye Danaah Gori II, the paramount chief of the Dorimon Traditional Council.

"This CREMA concept has come to us as a timely intervention to help address our efforts to manage our natural resources," he says. "Our neighbors in Wechiau and Zukpiri have CREMAs and we are left in the middle. AgNRM offered to help bridge the gap and we are grateful."

In the process of forming the CREMA, the AgNRM team prioritized consultation with stakeholders, especially the chiefs who control most of the land in the area. "We didn't know how to negotiate with the communities to accept the concept," explains Mwiniseori. "The AgNRM team discussed with chiefs and people in our communities to accept the broader efforts and benefits of coming together to conserve the environment."

With AgNRM's support, Dorimon has put in place the essential governance and management structures required under the CREMA formation process. These new institutions have motivated community members to make decisions about how they want to improve the management of their natural resources. According to Mwiniseori, the new CREMA is still drafting the necessary guiding documents, including the CREMA constitution and by-laws – but with the CREMA governance structures in place, the selected representatives are empowered to make and implement decisions on behalf of the member communities.

Because they are particularly involved in the processing of natural resources products in the area, and because the CREMA is democratic in nature, women have been included on CREMA committees at all levels. They will therefore be involved in critical decisions on natural resource governance.

"On an average, females constitute 40 percent of all CREMA representatives," Mwiniseori explains. "This position of the Queen Mother emphasizes the CREMA's recognition of the role women play in effective resource conservation and management." The paramount Queen Mother serves as a voice for the women of the CREMA.

And the Queen Mother is glad to see this work begin. "I see the project as development in all directions," she says. "It is one of the best things to happen to us women here."

CREMA patron Gori also emphasized the efforts AgNRM has made to empower women by encouraging them to actively participate in livelihood activities and natural resource management issues.

"I must say emphatically that women are even more excited about this project than the men," he says. "Our women are empowered. I see them produce soap and infant feed from moringa. I see a lot of improvement working with the CREMA, and I thank USAID AgNRM."

AgNRM's efforts to strengthen natural resource management in northern Ghana have helped Dorimon to take a new approach to managing their landscape and natural resources. In its success, the CREMA not only rewards its people for their initiative and sacrifice, but also inspires other communities in the Black Volta basin to embark on similar initiatives.

“As a group, we also decided to invest our income in our Village Saving and Loan Association account.”

– Karim Amina,  
smallholder farmer



## Dry season gardening builds resilience and bridges the food security and nutrition gap for vulnerable families

How homegrown vegetables are impacting nutrition and income generation

During Ghana’s wet season, Karim Amina, a smallholder farmer in Dorimon, relies almost exclusively on family labor to grow groundnuts and maize on a small piece of land. But when the dry season sets in, Amina and her entire family face the challenge of securing sufficient quantities of nutritious food for their meals.

Because farmers like Amina in northern Ghana largely depend on rain-fed agriculture, they are limited to a single harvest following the six-month rainy season. Many households cope with the dry season by shifting to other livelihood activities or seeking temporary employment elsewhere. Some can plant dry season gardens, but since this approach requires a reliable water source, it’s not an option available to everyone.

In March 2017, Amina and 55 other women in Dorimon participated in dry season garden activities hosted by the USAID Feed the Future Ghana Agriculture and Natural Resource Management (AgNRM) project. AgNRM is working to improve the food access of vulnerable households by promoting household production of several nutrient-rich crops. From January to April 2017, the women’s group in Dorimon grew leafy vegetables such as pumpkin and bean leaves, along with a few other vegetables, on two hectares of land. Using treadle pumps and hoses, Amina and her colleagues relied on a nearby dam to irrigate their crops.

“Previously, I used to sit idle during the dry season, looking for alternative activities that could help me support my family,” Amina says. “AgNRM’s dry season garden activities helped me and my colleagues produce nutritious food during the off-season.”

Through on-field practical training, Amina and the other participants learned to enrich the soil using environmentally sound, and less expensive, methods, such as applying livestock and poultry manure. AgNRM also organized a participatory cooking demonstration for the women to emphasize the many ways vegetables can be used to prepare their favorite dishes. Amina is excited to have gained this practical knowledge.

“I saw pumpkin leaves for the first time and also learnt about the health benefits of leafy vegetables helping families to grow well,” she says. “Normally, we used to grow vegetables only during the rainy season, but we now realized that we can also grow them throughout the year with high yields.”

Amina and her group harvested a bumper crop of vegetables in April 2017. Group members divided up about 40 percent of the harvest for their own use; the rest was sold in the local market. Amina says:

“We prepared tasty soups with the vegetables we grow on our own, thanks to AgNRM. As a group, we also decided to invest our income in our Village Saving and Loan Association account.”

Working together in the dry season garden has also instilled a team spirit in the group, Amina explained. She says the group members worked well together, and enjoyed the opportunity to discuss other issues and ideas in the process.

Dorimon’s dry season garden has been a hit among the women in the community, who look forward to replicating these methods in their own home gardens in the upcoming dry season. But Amina didn’t wait to put her newfound knowledge into practice. This farming season, she applied some of the new techniques, like the use of animal manure as fertilizer, on her main farm, with proven results. She explained that other group members did the same.

The women’s dry season garden put Dorimon one step closer to AgNRM’s goal of improved food security and nutrition for vulnerable Ghanaian communities.

Annex C: Detailed Gantt Chart of Planned and Actual Activity Implementation for FY 2017

Activity	End of FY 2017 Activity Status	Quarter 1			Quarter 2			Quarter 3			Quarter 4		
		O	N	D	J	F	M	A	M	J	J	A	S
Procurement													
<i>Project vehicle procurements</i>	Complete for FY17. Additional planned for FY18.												
Establish AgNRM Satellite Offices													
<i>Set up AgNRM office in Wa</i>	Complete												
<i>Set up AgNRM office in Sandema</i>	Complete												
Recruitment													
<i>GIS Specialist, Behavior Change Communications Specialist, Senior Operations and Human Resources Manager, NRM/MUS Manager, M&amp;E Officers</i>	Complete. Third M&E Officer will be recruited in FY18 with activities starting in the Eastern Biodiversity Corridor.												
Finalized AgNRM Operations Manual, Employee Manual of Procedures, and AgNRM Project Security Manual	Complete												
USAID Ghana trainings on Gender and Communications	Complete												
Winrock's Mobilize Community Action and Youth Employment (MOCA) trainings on child-labor and relevant Ghanaian labor laws by Kumasi-based staff	Complete												
Engagement of Short-Term Technical Experts for development of a shea road map and shea related capacity building activities for Outcome 1, Red Volta Basin CREMA assessment, EMMP	Complete												
Development of grant activities	Ongoing due to delay												
Quarterly Partner Meetings	Ongoing as planned												
Entry work in first six (6) CREMA sites	Complete												
Activities in Black Volta CREMAs	Ongoing as planned												
Activities in Western Biodiversity Corridor CREMAs	Ongoing as planned												
Red Volta River Basin CREMA Assessment	Complete												
Activities in Red Volta River Basin CREMAs	Ongoing as planned												





Annex C. FY 2017|Year 2 AgNRM Gantt Chart

Activity	End of FY 2017 Activity Status	Quarter 1			Quarter 2			Quarter 3			Quarter 4		
		O	N	D	J	F	M	A	M	J	J	A	S
<b>1.1.1 Greater understanding of the income generation potential of select natural resource products</b>													
Conduct sector and market systems analysis on selected natural resource products (NRPs)	Complete												
Engage trade associations and certification bodies in review and implementation of quality standards	Complete												
<b>1.1.2 Organize and strengthen producer/collector groups</b>													
Improve organization and structures of collector/producer groups in targeted CREMAs	Ongoing as planned												
Develop and implement tailored training program for collector/producer groups	Complete												
Strengthen market linkages and investments for three selected NRPs	Ongoing due to delay												
Build the capacity of select trade associations	Postponed to FY 18 as the project identifies formalized trade associations												
Facilitate collector/producer groups' access to finance	Complete												

Annex C. FY 2017|Year 2 AgNRM Gantt Chart

Activity	End of FY 2017 Activity Status	Quarter 1			Quarter 2			Quarter 3			Quarter 4		
		O	N	D	J	F	M	A	M	J	J	A	S
<b>1.2.1 Develop a comprehensive roadmap for shea sector investments</b>													
Map existing shea laws of Ghana and other relevant literature on developing a sustainable shea value chain	Complete	█	█	█	█	█	█						
Engage potential shea investors (e.g., Global Shea Alliance and exporters) on opportunities and weaknesses of the shea sector in	Ongoing as planned	█	█	█	█	█				█	█	█	
Collect and analyze data on shea production, processing and marketing in Ghana	Complete	█	█	█	█	█							
Engage Cocoa Research Institute of Ghana on the measures to reduce the gestation period for shea seedlings	Ongoing as planned	█	█	█	█	█	█				█	█	
Engage large scale shea buyers, processors and exporters on demand and supply of shea in northern Ghana	Ongoing as planned	█	█	█	█	█				█	█	█	
Determine the commercialization margins of shea	Ongoing due to delay	█	█	█	█	█				█	█	█	
Map out a strategy to establish a relationship between the key market actors and the collector/producer groups	Ongoing due to delay	█	█	█	█	█				█	█	█	
Determine the shea infrastructure needs in six (6) targeted CREMAs	Complete	█	█	█	█	█	█	█	█	█	█	█	
Produce and validate a roadmap for a sustainable shea value chain in the AgNRM targeted CREMAs	Complete						█	█		█	█	█	
<b>1.2.2 Maximize market opportunities through private sector and collector/processing groups</b>													
Identify and engage key actors to assess market dynamics for shea kernel and butter	Complete	█	█	█	█	█							
Develop guiding principles for market engagements	Ongoing as planned	█	█	█	█	█	█				█	█	
Select forty (40) collector/processor groups in six (6) CREMAs	Complete	█	█	█	█	█							
Conduct needs assessment of selected collector/processor groups	Complete				█	█	█	█	█	█			
Develop training materials based on identified needs	Ongoing as planned								█	█	█	█	

Annex C. FY 2017|Year 2 AgNRM Gantt Chart

Activity	End of FY 2017 Activity Status	Quarter 1			Quarter 2			Quarter 3			Quarter 4		
		O	N	D	J	F	M	A	M	J	J	A	S
Review existing VSLA systems in six (6) CREMAs	Complete												
Sensitize forty (40) collector/producer groups on VSLA improvements	Ongoing due to delay												
Map and engage financial service providers and other value chain actors to invest in identified market systems	Complete												
Engage financial service providers to develop and implement innovative and female-friendly products for collector/processor groups and members of trade associations	Ongoing due to delay												
Collaborate with trade association(s) to set up warehousing facilities in three (3) target CREMA (e.g., Global Shea Alliance)	Ongoing												
<b>1.2.3 Increase quality and quantity of shea products</b>													
Assess both quality and quantity of shea demand and supply	Complete												
Conduct a needs assessment of the collector/producer groups capacity around quality and quantity issues	Complete												
Conduct a series of training sessions on quality and quantity of shea supplies	Complete												
Facilitate use and production of appropriate clean energy cook stoves, dryers and roasters	Complete												
Identify and engage organic certification bodies on prospects of certification of collector/producer groups	Ongoing due to delay												
Facilitate organic certification of collector/producer groups	Ongoing as planned												
<b>2.1.1 Promote conservation agriculture and agroforestry adopted by farmers at scale across project zones</b>													
Collaborate on a regional forum on CA/CSA to share and learn known/adoptable technologies	Complete												

Annex C. FY 2017|Year 2 AgNRM Gantt Chart

Activity	End of FY 2017 Activity Status	Quarter 1			Quarter 2			Quarter 3			Quarter 4		
		O	N	D	J	F	M	A	M	J	J	A	S
Establish and train farmer groups on adaptable and profitable tools and methods for conservation agriculture	Ongoing as planned												
Support learning and sharing visits to on-going demos for willing individuals, organized groups and institutions on afforestation/agroforestry interventions	Postponed to FY18 due to armyworm issues at field demo sites												
Support educational efforts/ awareness creation on CS mitigation tools and methods	Complete												
<b>2.1.2 Promote integrated soil fertility management, agriculture water management, and integrated pest management adopted by farmers</b>													
Support farmer field schools of IPM for participants drawn from CREMAs	Complete												
<b>2.1.3 Develop productive water management technologies and systems</b>													
Develop water strategy and collect water-related data	Ongoing due to delay												
Engage stakeholders on appropriate water management ('key-hole garden' and drip irrigation) and technology	Postponed to address tenure and water availability issues												
<b>2.2.1 Increase women's ability to save and manage finances</b>													
Organize community forums of women to discuss intent and purpose of VSLA	Complete												
Support registration and required documentation exercise	Ongoing as planned												
Provide twelve (12) savings boxes for VSLAs	Complete												
<b>2.2.2 Increased diversity of nutritious plants produced and consumed by households</b>													
Improve the productivity of home gardens	Ongoing as planned												
Support education on utilization of nutritious plants	Complete												

Annex C. FY 2017|Year 2 AgNRM Gantt Chart

Activity	End of FY 2017 Activity Status	Quarter 1			Quarter 2			Quarter 3			Quarter 4		
		O	N	D	J	F	M	A	M	J	J	A	S
<b>2.2.3 Develop women's time saving activities</b>													
Identify women participants for livestock raising	Complete												
Organise sensitization programs on aims and objectives of women's livestock program	Complete												
Provide support for the construction of needed infrastructure to house livestock	Cancelled due to approach modified and activity deleted												
<b>3.1.1 Increase understanding of land and water access rights and ownership</b>													
Complete an assessment on access to land, resource tenure security, and resource-related decision-making processes in targeted CREMAs sites	Complete												
Convene stakeholder forums with community, district and regional leaders to present findings and formulate recommendations on strengthening access to land	Complete												
Train women leaders in interest-based negotiation skills and strategies	Complete												
Educate women leaders on laws protecting women's rights and access to natural resources	Ongoing as planned												
<b>3.1.2 Establish and apply a clear hierarchy of resource access and use rights for each community</b>													
Facilitate discussion sessions with local leaders and community members to clarify and hierarchy of resource access and use rights	Ongoing as planned												
Build stakeholder capacity on concepts of land rights and mechanisms to increase tenure security	Ongoing as planned												

Annex C. FY 2017|Year 2 AgNRM Gantt Chart

Activity	End of FY 2017 Activity Status	Quarter 1			Quarter 2			Quarter 3			Quarter 4		
		O	N	D	J	F	M	A	M	J	J	A	S
<b>3.1.3 Set up geospatial data base for project intervention sites to support and record access and rights agreements</b>	-												
Build capacity to engage in basic boundary demarcation with GPS and GIS	Complete												
<b>3.2.1 Facilitate community demarcation of land boundaries</b>													
Conduct participatory mapping exercises to agree on CREMA and individual community boundaries	Ongoing as planned												
Facilitate landscape zonation in targeted CREMAs	Ongoing as planned												
<b>3.2.2 Increase community awareness of public land boundaries and limitations to their use</b>													
Select and train community land advocates on land use regulations	Ongoing as planned												
Facilitate community wide advocacy for and awareness about land and resource use boundaries	Ongoing as planned												
<b>3.2.3 Develop mechanisms to mediate land disputes and promote peace and order</b>													
Develop early warning and response system to prevent conflict	Postponed to FY18 due to discussions on where to house the system												
Build capacity for managing the early warning and early response systems in six (6) CREMAs	Ongoing due to delay												
Develop an ADR training manual tailored to natural resource conflicts	Ongoing due to delay												
Build capacity for conflict analysis and resolution of CREMA management teams	Ongoing due to delay												
Put in place an early warning and early response system to prevent natural resource conflicts	Postponed to FY18 due to discussions on where to house the system												

Annex C. FY 2017|Year 2 AgNRM Gantt Chart

Activity	End of FY 2017 Activity Status	Quarter 1			Quarter 2			Quarter 3			Quarter 4	
		O	N	D	J	F	M	A	M	J	J	A
<b>4.1.1 CREMA and Farmer Managed Natural Regeneration (FMNR) associations established</b>												
Community engagement on CREMA foundation (3 sites)	Complete (Dorimon, SKGK, MWK)	█	█	█	█	█	█	█	█	█		
Formalization of Community Resource Management Committees (2 sites)	Complete in 2 CREMAs (Dorimon, SKGK)	█	█	█	█	█	█	█	█	█		
Engagement with relevant local government agencies	Complete (WD, District Assembly)	█	█	█	█	█	█	█	█	█	█	█
Development/revision of CREMA constitutions	Complete for 2 CREMAs, Ongoing elsewhere			█	█	█	█	█	█	█	█	█
Development/revision of CREMA by-laws	Ongoing as planned			█	█			█	█	█	█	█
Training of CREMAs patrol teams	Postponed to FY18	█	█	█	█	█	█	█	█	█	█	█
Support to CREMA field teams (4 sites)	Ongoing	█	█	█	█	█	█	█	█	█	█	█
Learning exchange visits to Wechiau Community Hippo Sanctuary (4 sites)	Ongoing with some revisions: Dorimon completed; Zukpiri pending			█	█	█	█	█	█			
Learning exchange visits to Burkina Faso (4 sites)	Postponed to FY18									█	█	█
<b>4.1.2 Improve NRM through community based initiatives</b>												
Natural Resource Management and CREMA training	Completed as planned		█	█			█	█		█	█	█
Boundary agreement and zoning	Complete in 3 CREMAs (Black Volta), Ongoing as planned in SKGK, yet to start in BY and MW			█	█	█	█	█	█	█	█	█
Opening of management and NRP access trails	Cancelled				█	█	█	█	█	█	█	█
Development/Revision of CREMA Management Plans	Ongoing as planned				█	█	█	█	█	█	█	█



Annex C. FY 2017|Year 2 AgNRM Gantt Chart

Activity	End of FY 2017 Activity Status	Quarter 1			Quarter 2			Quarter 3			Quarter 4		
		O	N	D	J	F	M	A	M	J	J	A	S
Monitoring of CREMA biodiversity	Ongoing as planned												
NRP negotiations between CREMAs and concessionaires (3 sites)	Completed												
CREMA grant program for riparian actions	Delayed until FY18												
CREMA grant program for CREMA development	Delayed until FY18												
<b>4.2.1 Develop values for ecosystem services in targeted areas</b>													
Convene stakeholder and expert meeting	Complete												
Spatial analysis of Payment for Ecosystem Services (PES) in northern Ghana	Complete, but for ecosystem valuation												
Economic Analysis	Ongoing due to delay in identifying economist to conduct the analysis												
Design options for regional PES market	Ongoing – this has been altered slightly into an ecosystem valuation analysis and guidance document for CREMAs and other local communities												
Stakeholder event to present analyses and market mechanism options	Postponed to the first quarter of FY18 because of delays with economic analysis												
Stakeholder consultation with selected CREMAs	Completed for FY17 and is ongoing as planned												
Finalization of regional PES market plan	Ongoing with delay because of economic analysis. Will be finalized in Q1 of FY18												

Annex C. FY 2017|Year 2 AgNRM Gantt Chart

Activity	End of FY 2017 Activity Status	Quarter 1			Quarter 2			Quarter 3			Quarter 4		
		O	N	D	J	F	M	A	M	J	J	A	S
		Begin pilot of PES plan in selected CREMAs	Postponed to FY18 because of delays in economic analysis and in integrating ecosystem valuation into community/CREMA management plans										
<b>4.2.2 Increase understanding of the links between ecosystem services and livelihoods on the part of all stakeholders</b>													
Introductory training on PES in northern Ghana	Complete												
Secondary training on PES selected for northern Ghana	Complete												
<b>4.2.3 Improved accounting of carbon stocks in target zones</b>													
Establishment of national Forest RL and assessment of data gaps for northern Ghana	Complete												
Agriculture land use remote sensing analysis for northern Ghana	Complete												
Forest carbon stock field work	Postponed to FY18 – planned field work with the Forestry Commission was determined to be a lower priority because sufficient carbon data exists for forest carbon stocks for the FC's purposes. A refocused field effort that would focus on value chains is being reassessed for FY18.												
Tier 2 carbon stock data for forest in northern Ghana	Cancelled because of reasons identified directly above.												
Remote sensing analysis to assess carbon stock in non-forested land	Complete												
Modeling for non-forest emission factors	Cancelled because of reasons listed above.												

## Annex D: FY 2017 EMMP table

Mitigation Measure from EMMP	Status of Mitigation Measure	Outstanding Mitigation Issues	Remarks
<b>Outcome I – Increased income from natural resource products</b>			
1.1 Natural resource value chains developed			
1.1.1 Greater understanding of the income generation potential of select natural resources products	NA	NA	Categorical Exclusion
1.1.2 Organize and strengthen producer/ collector groups <ul style="list-style-type: none"> <li>Ensure that training and organizational capacity-building will integrate and promote general awareness of the environmental, health and safety risks presented by AgNRM promoted agriculture and NRP activities, and appropriate choices and measures to manage these risks.</li> <li>Ensure that training and capacity building activities promote techniques that are appropriate to the specific local context.</li> </ul>	<ul style="list-style-type: none"> <li>A health and safety manual has been developed and is being followed during training sessions and field demonstrations; Environmental safeguards have been incorporated in curricula</li> <li>Environmentally sound NRP harvesting and processing practices promoted by AgNRM financing efforts</li> </ul>	<ul style="list-style-type: none"> <li>Environmentally sound NRP harvesting and processing practices promoted by AgNRM financing efforts.</li> </ul>	Outcome I grants which are the main tools of the project in promoting environmentally sound NRP harvesting/processing through financing efforts will be deployed in FY 2018.
1.2 Increased income from the shea butter value chain			
1.2.1 Develop a comprehensive roadmap for shea sector investments <ul style="list-style-type: none"> <li>Ensure that the roadmap includes measures and recommendations to: <ul style="list-style-type: none"> <li>Avoid potential adverse impacts of the use of nonnative species for afforestation or other purposes</li> <li>Prevent conversion of relatively intact natural forest to plantations</li> <li>Address adverse economic consequences on local communities, including from loss of usual and customary use of resources</li> <li>Integrate significant stakeholder consultation, including customary users of resources</li> <li>Fully integrate the principles of adaptive management</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Shea roadmap has been developed to guide sustainable development of the shea sector in line with mitigations measures of the EMMP</li> <li>Shea propagation strategy for environmentally friendly and sustainable propagation of shea is in place</li> </ul>	<ul style="list-style-type: none"> <li>Validation of the shea roadmap at the CREMA level</li> </ul>	This will commence in FY 2018
1.2.2 Maximize market opportunities through private sector and collector/ processing groups			No activities relating to warehouse development/ construction

Mitigation Measure from EMMP	Status of Mitigation Measure	Outstanding Mitigation Issues	Remarks
<ul style="list-style-type: none"> <li>• Ensure that training and organizational capacity-building will integrate and promote general awareness of the environmental, health and safety risks presented by AgNRM promoted agriculture and NRP activities, and appropriate choices and measures to manage these risks.</li> <li>• Ensure that training and capacity building activities promote techniques are appropriate to the specific local context.</li> <li>• Include training in environmental safeguards such as sustained yield harvesting practices for NRP collection and cleaner production practices for NRP processing.</li> <li>• Conduct an assessment of the financial services entities' environmental due diligence procedures against the requirements for such procedures stipulated in the IEE.</li> </ul>	<ul style="list-style-type: none"> <li>• Environmentally sound NRP harvesting and processing practices promoted by AgNRM financing effort</li> <li>• Promoted techniques are appropriate to the specific local context</li> <li>• Environmental safeguards considerations were included in training events for processor groups</li> <li>• Assessment of the financial services entities' environmental due diligence are yet to be conducted</li> </ul>	<ul style="list-style-type: none"> <li>• Environmental safeguards will be incorporated in training curricula</li> <li>• Warehousing infrastructure development plans and as built inspections are in compliance with USAID Sector Guidelines for Small Scale Construction and this EMMP</li> <li>• Assessment of the financial services entities' environmental due diligence is outstanding</li> </ul>	were implemented in Year 2
<p>1.2.3 Increase quality and quantity of shea products</p> <ul style="list-style-type: none"> <li>• Ensure that training and organizational capacity building will integrate and promote general awareness of the environmental, health and safety risks presented by AgNRM promoted agriculture and NRP activities</li> <li>• Ensure that training and capacity building activities promote techniques are appropriate to the specific local context</li> <li>• Specifically, fuelwood supply and demand will be assessed and a plan for sustainable supply will be prepared as part of activities supporting expanded processing of NRPs.</li> <li>• Trail construction and maintenance activity plans in core protected areas will be reviewed and approved by appropriate Wildlife Division authorities to ensure that proposed activities are consistent with local and national regulations.</li> <li>• Development and/or rehabilitation of small-scale irrigation works must be generally consistent with good-</li> </ul>	<ul style="list-style-type: none"> <li>• Training and organizational capacity building integrate and promote general awareness of the environmental, health and safety risks</li> <li>• Training and capacity building activities promoted techniques appropriate to the specific local context</li> </ul> <p>N/A</p> <p>N/A</p>	<ul style="list-style-type: none"> <li>• Fuelwood supply and demand assessments are yet to be conducted</li> </ul>	There was no construction activities during the period under review

Mitigation Measure from EMMP	Status of Mitigation Measure	Outstanding Mitigation Issues	Remarks
<p>practice guidance of USAID's <i>Sector Environmental Guidelines</i>.</p> <ul style="list-style-type: none"> <li>Provision of potable water for drinking or agro-processing must be generally consistent with good-practice guidance of USAID's <i>Sector Environmental Guidelines: Water Supply and Sanitation</i>.</li> <li>Establishment or expansion of agricultural/agroforestry/silviculture nurseries and plots must comply with the siting criteria below and promoted tree and agroforestry species must be endorsed for use by the relevant governmental authority.</li> </ul>	<p>N/A</p> <ul style="list-style-type: none"> <li>Establishment of nurseries and plots complied with the siting criteria included in AgNRM's EMMP</li> </ul>		
<b>Outcome 2 – Improved food and nutritional security</b>			
2.1 Intensified and diversified climate smart technologies for production			
<p>2.1.1 Promote conservation agriculture and agroforestry adopted by farmers at scale across project zones</p> <ul style="list-style-type: none"> <li>Ensure that training integrates and promotes general awareness of the environmental, health and safety risks presented by AgNRM promoted agriculture and NRP activities, and appropriate choices and measures to manage these risks.</li> <li>Ensure that training and capacity building activities promote techniques are appropriate to the specific local context.</li> <li>Ensure that at demonstrations: only crops and varieties appropriate for the agro-climatic zone are being introduced; 2) exotic invasive species are not being introduced; 3) GMOs are not provided or promoted, and 4) promoted crops have been endorsed for use by the relevant governmental authority.</li> <li>Only provide, recommend or otherwise support pesticide use in conformity with the provisions the more relevant of either the approved ATT or ADVANCE PERSUAPs and an AgNRM specific Safer Use Action Plan (SUAP) to ensure safe application of inputs including biological/organic/natural inputs.</li> </ul>	<ul style="list-style-type: none"> <li>Training under the CSA interventions integrated and promoted general awareness of the environmental, health and safety risks</li> <li>Training and capacity building activities and techniques are appropriate to the specific local context</li> <li>Only approved crop varieties endorsed by MoFA were promoted</li> <li>The ADVANCE and ATT PERSUAPs were followed</li> </ul>	<ul style="list-style-type: none"> <li>Development of a CSA strategy to guide implementation of CSA practices</li> <li>AgNRM will develop a SUAP in Year 3</li> </ul>	<ul style="list-style-type: none"> <li>AgNRM will develop a CSA strategy in Year 3</li> </ul>

Mitigation Measure from EMMP	Status of Mitigation Measure	Outstanding Mitigation Issues	Remarks
<ul style="list-style-type: none"> <li>For soil fertility management, promote the use of measures from the USAID/Africa Bureau Fertilizer Factsheet.</li> <li>Ensure promoted/utilized biologic agents for soil fertility enhancement are approved for use in Ghana by the cognizant GoG entity and must be used/promoted in conformity with the directives and restrictions attached to such approval.</li> <li>Incorporate and promote good agricultural and irrigation practices in general conformity with the USAID Sector Guidelines for Agriculture.</li> <li>Ensure that no activities involve the conversion of any primary or secondary forested land; and</li> <li>Ensure that no activities will be carried out in any protected areas.</li> </ul>	<ul style="list-style-type: none"> <li>This mitigation measure was followed</li> <li>This mitigation measure was followed</li> <li>This mitigation measure was followed</li> <li>This mitigation measure was followed</li> <li>This mitigation measure was followed</li> </ul>		
<p>2.1.2 Promote integrated soil fertility management, agriculture water management, and integrated pest management adopted by farmers</p> <ul style="list-style-type: none"> <li>AgNRM will incorporate into training curriculum and trainings the use of measures from the USAID/Africa Bureau Fertilizer Factsheet.</li> <li>AgNRM will ensure that at demonstrations: only seeds appropriate for the agro-climatic zone are being introduced; 2) exotic invasive species are not being introduced; and 3) GMOs and LMOs are not provided or promoted.</li> </ul>	<ul style="list-style-type: none"> <li>This mitigation measure was followed</li> <li>This mitigation measure was followed</li> </ul>	<ul style="list-style-type: none"> <li>Full implementation of this measure is outstanding</li> </ul>	
<p>2.1.3 Develop productive water management technologies and systems developed</p> <ul style="list-style-type: none"> <li>Ensure that training and organizational capacity-building will integrate and promote general awareness of the environmental, health and safety risks presented by AgNRM promoted MUS activities, and appropriate choices and measures to manage these risks.</li> </ul>	<ul style="list-style-type: none"> <li>Training and capacity building interventions integrated and promoted general awareness of the environmental, health and safety measures</li> </ul>		

Mitigation Measure from EMMP	Status of Mitigation Measure	Outstanding Mitigation Issues	Remarks
<ul style="list-style-type: none"> <li>• Ensure that training and capacity building activities promote techniques are appropriate to the specific local context.</li> <li>• Ensure that development and/or rehabilitation of small-scale irrigation works are in general conformity with good-practice guidance of USAID's Sector Environmental Guidelines</li> <li>• Provide complementary support to irrigation facility users association or other management entity to ensure suitable capacity for managing the scheme otherwise, consistent with the requirements established under IEE.</li> <li>• Conduct, as described more fully in the Development of Grant Activities section above, jointly with the sub-grantee, an environmental review of proposed sub-grant activities in accordance with the USAID Africa Bureau Environmental Review Form (ERF).</li> <li>• Ensure that no activities involve the conversion of any primary or secondary forested land, and for MUS:</li> <li>• Ensure that provision of potable water for drinking or agro-processing must be generally consistent with good-practice guidance of USAID's Sector Environmental Guidelines: Water Supply and Sanitation.</li> <li>• Any potable water supply rehabilitated or constructed with AgNRM direct or indirect support will be accompanied by a Water Quality Assurance Plan.</li> <li>• Capacity-building in equipment/system maintenance must be co-programmed with construction/installation of small scale water supply and sanitation infrastructure.</li> </ul>	<ul style="list-style-type: none"> <li>• This mitigation measure was met</li> <li>• N/A</li> <li>• N/A</li> <li>• N/A for period under review</li> <li>• This mitigation measure was met</li> <li>• N/A under the period under review</li> <li>• N/A under the period under review</li> <li>• N/A under the period under review</li> </ul>		
2.2 Strengthened capacities for modifications to existing livelihoods and improved nutrition			

Mitigation Measure from EMMP	Status of Mitigation Measure	Outstanding Mitigation Issues	Remarks
2.2.1 Increase women's ability to save and manage finances	N/A	N/A	Categorical Exclusion
<p>2.2.2 Increase diversity of nutritious plants produced and consumed by households</p> <ul style="list-style-type: none"> <li>Ensure that at demonstrations: 1) only crops and varieties appropriate for the agro-climatic zone are being introduced; 2) exotic invasive species are not being introduced; 3) GMOs and LMOs are not provided or promoted, and 4) promoted crops have been endorsed for use by the relevant governmental authority.</li> <li>Only provide, recommend or otherwise support pesticide use in conformity with the provisions the more relevant of either the approved ATT or ADVANCE PERSUAPs and an AgNRM specific Safer Use Action Plan (SUAP) to ensure safe application of inputs including biological/organic/natural inputs. In the absence of specific ATT or ADVANCE PERSUAP guidance, pesticide provision or support, pesticides and fumigants for crop storage, will not be supported.</li> <li>For soil fertility management promote the use of measures from the USAID/Africa Bureau Fertilizer Factsheet.</li> <li>Ensure promoted/utilized biologic agents for soil fertility enhancement are approved for use in Ghana by the cognizant GoG entity and must be used/promoted in conformity with the directives and restrictions attached to such approval.</li> <li>Incorporate and promote good agricultural and irrigation practices.</li> </ul>	<ul style="list-style-type: none"> <li>Only approved crop varieties endorsed by MoFA were promoted</li> <li>The ADVANCE and ATT PERSUAPs were followed</li> <li>This mitigation measure was met through the use of ISFM practices</li> <li>This mitigation measure was met</li> <li>This mitigation measure was met</li> </ul>	<ul style="list-style-type: none"> <li>AgNRM will develop a SUAP in Year 3</li> <li>More soil conservation and agroforestry systems need to be put in place to minimize nutrient loss</li> </ul>	



Mitigation Measure from EMMP	Status of Mitigation Measure	Outstanding Mitigation Issues	Remarks
<ul style="list-style-type: none"> <li>Ensure that no activities involve the conversion of any primary or secondary forested land.</li> </ul>	<ul style="list-style-type: none"> <li>This mitigation measure was met</li> </ul>		
<p>2.2.3 Develop women's time saving activities</p> <ul style="list-style-type: none"> <li>Ensure that at demonstrations: only fodder crops and animal breeds appropriate for the agro climatic zone are being promoted; 2) exotic invasive species are not being introduced or promoted; and 3) GMOs are not provided or promoted, and 4) promoted fodder crops and animal breeds have been endorsed for use by the relevant governmental authority</li> <li>Ensure that no activities involve the conversion of any primary or secondary forested land, and</li> <li>Ensure that no activities will be carried out in any protected areas.</li> </ul>	<ul style="list-style-type: none"> <li>Only approved crop varieties endorsed by MoFA were promoted</li> <li>This mitigation measure was met</li> <li>This mitigation measure was met</li> </ul>		
<b>Outcome 3 – Increased security of farmer access and use of community natural resources</b>			
3.1 Women's access to land and natural resources strengthened			
3.1.1 Increase understanding of land and water access rights and ownership	N/A	N/A	Categorical exclusion
<p>3.1.2 Establish and apply a clear hierarchy of resource access and use rights for each community</p> <p>I. Ensure that the project's technical assistance for development, reform, review and advocacy of land and resource rights and REDD+ readiness, is cognizant of and embody and strongly advocates measures to:</p> <p>a. Avoid potential adverse impacts of the use of nonnative species for afforestation or other purposes. Beyond this, assure careful selection of species</p>	<ul style="list-style-type: none"> <li>This mitigation measure was met</li> </ul>		

Mitigation Measure from EMMP	Status of Mitigation Measure	Outstanding Mitigation Issues	Remarks
<p>for reforestation /afforestation to maintain/restore ecosystem balance and sustain biodiversity</p> <p>b. Prevent conversion of relatively intact natural forest to plantations.</p> <p>c. Prevent use of agrochemicals in forest areas except in conformity with the provisions of a duly approved PERSUAP specifically designated as covering the activity in question.</p> <p>d. Address adverse economic consequences on local communities, including from loss of usual and customary use of resources.</p> <p>e. Integrate significant stakeholder consultation, including customary users of resources.</p> <p>f. Fully integrate the principles of adaptive management</p>	<ul style="list-style-type: none"> <li>• This mitigation measure was met</li> <li>• This mitigation measure was met</li> <li>• This mitigation measure was met</li> <li>• This mitigation measure was met</li> </ul>		
3.1.3 Set up geospatial data base for project intervention sites to support and record access and rights agreements	N/A	N/A	Categorical Exclusion
3.2 Develop clear land boundaries for project interventions to avoid conflict			
<p>3.2.1 Facilitate community demarcation of land boundaries</p> <p>I. Ensure that the project's technical assistance for development, reform, review and advocacy of land and resource rights and REDD+ readiness, is cognizant of and embodies and strongly advocates measures to:</p> <ul style="list-style-type: none"> <li>• Prevent conversion of relatively intact natural forest to plantations</li> <li>• Address adverse economic consequences on local communities, including from loss of</li> </ul>	<ul style="list-style-type: none"> <li>• Mitigation measure was implemented</li> <li>• Mitigation measure was implemented</li> </ul>		

Mitigation Measure from EMMP	Status of Mitigation Measure	Outstanding Mitigation Issues	Remarks
<p>usual and customary use of resources</p> <ul style="list-style-type: none"> <li>• Integrate significant stakeholder consultation, including customary users of resources</li> <li>• Fully integrate the principles of adaptive management</li> </ul>	<ul style="list-style-type: none"> <li>• Mitigation measure was implemented</li> <li>• Mitigation measure was implemented</li> </ul>		
<p>3.2.2 Increase community awareness of public land boundaries and limitations to their use</p> <ul style="list-style-type: none"> <li>• Integrate and promote general awareness of the environmental, health and safety risks presented by AgNRM promoted agriculture and NRP activities, and appropriate choices and measures to manage these risks.</li> <li>• Promote techniques are appropriate to the specific local context. (i.e., do not contribute to destruction or degradation of natural habitat, including deforestation, land degradation and drainage of wetlands; lead to loss of biodiversity; erosion or loss of soil fertility, siltation of water bodies or reduction in water quality; or spread disease).</li> <li>• Ensure any activities that support sub-grantee and beneficiary activities in protected areas will: <ul style="list-style-type: none"> <li>– Be authorized by relevant government authorities</li> <li>– Not include activities in gazetted protected areas</li> <li>– Not support conversion of forest lands to agricultural lands both within and outside of protected areas</li> </ul> </li> <li>• Ensure the trainings and stakeholder advocacy and awareness raising address adverse economic consequences on local communities, including from loss of usual and customary</li> </ul>	<ul style="list-style-type: none"> <li>• Mitigation measure was implemented</li> <li>• Mitigation measure was implemented</li> <li>• Mitigation measure was implemented</li> <li>• Mitigation measure was implemented</li> </ul>		

Mitigation Measure from EMMP	Status of Mitigation Measure	Outstanding Mitigation Issues	Remarks
use of resources and will ensure protections for poor and vulnerable households equitable access to resources and land.			
<p>3.2.3 Develop mechanisms to mediate land disputes and promote peace and order</p> <ul style="list-style-type: none"> <li>For land and resource rights training materials development and trainings AgNRM will include appropriate environmental safeguards.</li> <li>The trainings and stakeholder forum will address adverse economic consequences on local communities, including from loss of usual and customary use of resources and will ensure protections for poor and vulnerable households equitable access to resources and land.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures were implemented</li> <li>Mitigation measure was implemented</li> </ul>		
<b>Outcome 4 – Strengthened Environmental Stewardship</b>			
<b>4.1 Improved management and conservation of select watersheds and biodiversity corridors in the Volta Basin</b>			
<p>4.1.1 Improve NRM through community based initiatives</p> <ul style="list-style-type: none"> <li>Ensure that training and organizational capacity-building will integrate and promote general awareness of the environmental, health and safety risks presented by AgNRM promoted agriculture and NRP activities, and appropriate choices and measures to manage these risks.</li> <li>Ensure that training and capacity building activities promote techniques are appropriate to the specific local context. (i.e., do not contribute to destruction or degradation of natural habitat, including deforestation, land degradation and drainage of wetlands; lead to loss of biodiversity; erosion or loss of soil fertility, siltation of water</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measure was implemented</li> <li>Mitigation measure was implemented</li> </ul>		

Mitigation Measure from EMMP	Status of Mitigation Measure	Outstanding Mitigation Issues	Remarks
<p>bodies or reduction in water quality; or spread disease).</p> <ul style="list-style-type: none"> <li>• Only provide, recommend or otherwise support pesticide use in conformity with the provisions the more relevant of either the approved ATT or ADVANCE PERSUAPs and an AgNRM specific Safer Use Action Plan (SUAP) to ensure safe application of inputs including</li> <li>• biological/organic/natural inputs. In the absence of specific ATT or ADVANCE PERSUAP guidance, pesticide provision or support, pesticides and fumigants for crop storage, will not be supported</li> <li>• Ensure any activities that support sub-grantee and beneficiary activities in protected areas will: <ul style="list-style-type: none"> <li>– Be authorized by relevant government authorities</li> <li>– Not include extension activities in gazetted protected areas</li> <li>– Not support conversion of forest lands to agricultural lands both within and outside of protected areas</li> <li>– Not include siting inside the boundaries of protected areas of nurseries, seed replication plots, demonstration plots, woodlots or land clearance for same.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Mitigation measure was put in place and approved PERSUAPs followed</li> <li>• Mitigation measure was put in place</li> <li>• Mitigation measure was put in place</li> </ul>	<ul style="list-style-type: none"> <li>• AgNRM will develop a SUAP in Year 3</li> </ul>	
<p>4.1.2 Establish CREMA and FMNR associations</p> <p>Ensure that no activities involve the conversion of any primary or secondary forested land and:</p> <p>Ensure any activities that support sub-grantee and beneficiary activities in protected areas will:</p> <ul style="list-style-type: none"> <li>• Be authorized by relevant government authorities</li> <li>• Not include activities in gazetted protected areas</li> <li>• Not support conversion of forest lands to agricultural lands both within and outside of protected areas</li> </ul>	<ul style="list-style-type: none"> <li>• Mitigation measure was met</li> <li>• N/A</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>	<p>Relevant activities were not implemented during the year in review</p>

Mitigation Measure from EMMP	Status of Mitigation Measure	Outstanding Mitigation Issues	Remarks
<p>Ensure that the project's technical assistance for management planning including determination of land and resource rights and REDD+ readiness, is cognizant of, embodies, and strongly advocates measures to:</p> <ul style="list-style-type: none"> <li>Avoid potential adverse impacts of the use of nonnative species for afforestation or other purposes. Beyond this, assure careful selection of species for reforestation /afforestation to maintain/restore ecosystem balance and sustain biodiversity</li> <li>Prevent conversion of relatively intact natural forest to plantations</li> <li>Prevent use of agrochemicals in forest areas except in conformity with the provisions of the more relevant of the ATT or ADVANCE PERSUAPs and an approved AgNRM SUAP</li> <li>Address adverse economic consequences on local communities, including from loss of usual and customary use of resources</li> <li>Integrate significant stakeholder consultation, including customary users of resources</li> <li>Fully integrate the principles of adaptive management</li> </ul> <p>Provide support for implementation, monitoring and enforcement as a required complementary activity following management plan development</p>	<ul style="list-style-type: none"> <li>Mitigation measure was implemented</li> <li>Mitigation measures were implemented</li> </ul>	<ul style="list-style-type: none"> <li>AgNRM will develop a SUAP in Year 3</li> </ul>	
<b>4.2 Ecosystem services improved</b>			
4.2.2 Increase understanding of the links between ecosystem services and livelihoods on the part of all stakeholders			
<p>4.2.3 Improve accounting of carbon stocks in target zones</p> <ul style="list-style-type: none"> <li>Ensure that the project's technical assistance for development, reform, review and advocacy of land and resource rights and REDD+ readiness, must be cognizant of and embody and strongly advocate measures to:</li> <li>Avoid potential adverse impacts of the use of nonnative species for</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures were implemented</li> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	There were not related activities

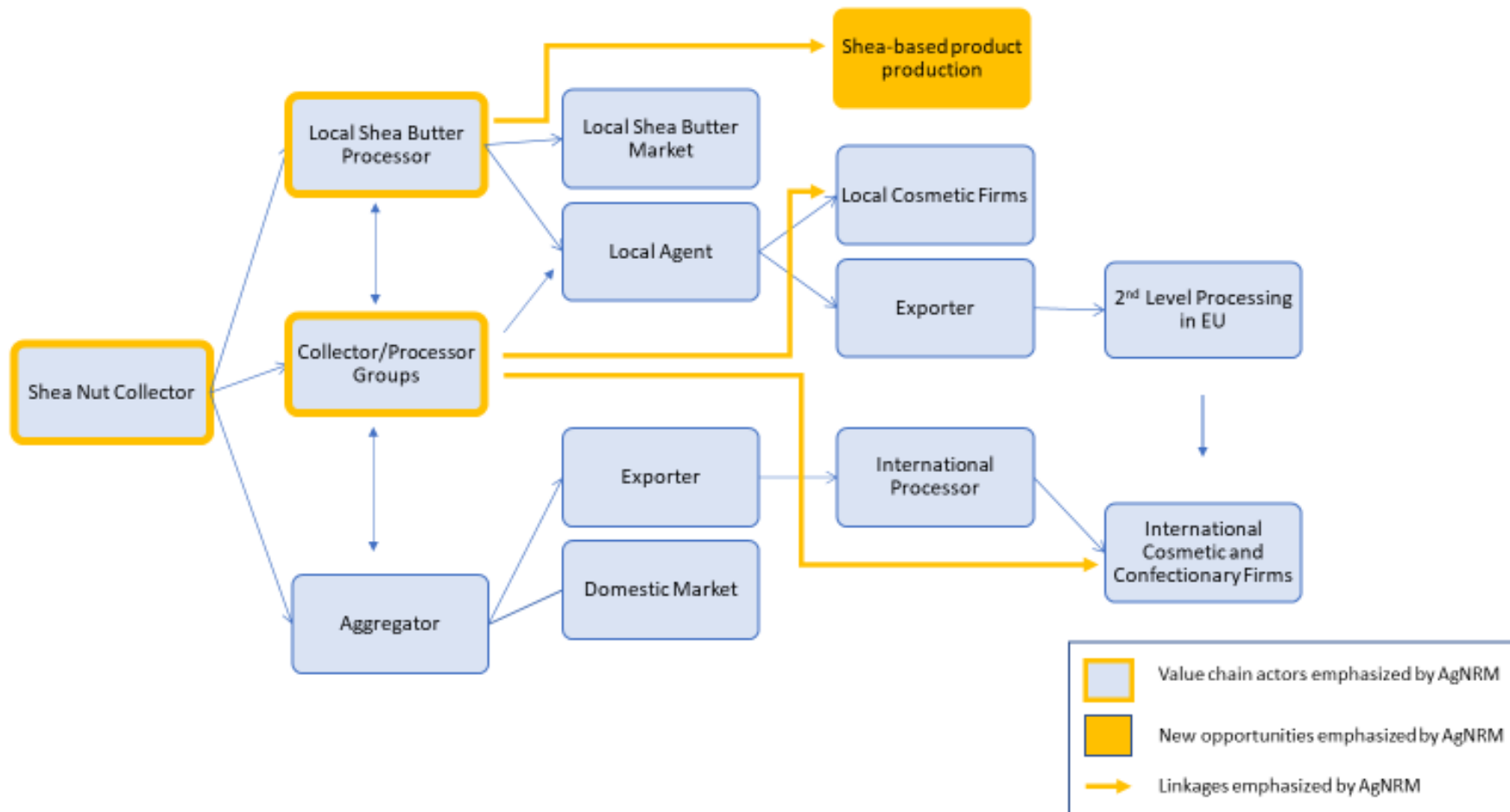
Mitigation Measure from EMMP	Status of Mitigation Measure	Outstanding Mitigation Issues	Remarks
<p>afforestation or other purposes. Beyond this, assure careful selection of species for reforestation /afforestation to maintain/restore ecosystem balance and sustain biodiversity</p> <ul style="list-style-type: none"> <li>• Prevent conversion of relatively intact natural forest to plantations</li> <li>• Prevent use of agrochemicals in forest areas except in conformity with the provisions of a duly approved PERSUAP specifically designated as covering the activity in question.</li> <li>• Address adverse economic consequences on local communities, including from loss of usual and customary use of resources</li> <li>• Integrate significant stakeholder consultation, including customary users of resources</li> <li>• Fully integrate the principles of adaptive management</li> </ul>			<p>implemented during the period in review</p>

## Annex E: List of assessments/technical documents completed in FY 2017

1. Gender Integration Strategy in Agriculture and Natural Resources Management in Northern Ghana
2. Black Volta CREMAs Land use land cover map from visual interpretation of Sentinel-2 image data (10-meter resolution) from November 2016, and ASTER 15-meter image data from November 2015
3. Shea Roadmap
4. Value Chain Financing Arrangements and Options for Selected Natural Resource Products (NRPs) in Community Resource Management Areas (CREMAs) of Northern Ghana
5. Analyzing the Visibility of NRPs in Black Volta CREMAs – Inventory Report
6. Land Tenure and Natural Resource Access in Northern Ghana – With a focus on women
7. Eastern Biodiversity Corridor Assessment Report
8. Ecosystem Valuation Background Paper



Annex F: AgNRM's Shea Value Chain Interventions in FY 2017



Annex G: AgNRM Staff List (as of September 30, 2017)

<b>No.</b>	<b>Title</b>	<b>AgNRM Partner Institution</b>	<b>Name</b>	<b>Status on September 30, 2017</b>
1	Chief of Party (COP) – Key Personnel	Winrock	Julie E. Fischer	At post
2	Deputy Chief of Party (DCOP) and Technical Office Chief – Key Personnel	Winrock	Patrick Adjewodah	At post
3	Governance, Land & Conflict (GL&C) Specialist – Key Personnel	Winrock	Martin Yelibora	At post
4	M&E Director	Winrock	Emmanuel Morna	At post
5	Finance Manager	Winrock	Antoinette Akanlise	At post
6	Management Information Specialist and Information Technology (MIS/IT) Specialist	Winrock	Eric Yartey	At post
7	Accountant	Winrock	Margaret Oketola	At post
8	Senior Operations and Human Resources Manager	Winrock	Baptista Sarah Gebu	At post
9	Procurement Officer	Winrock	Joyce Adongma Abugre	At post
10	Administrative Assistant	Winrock	Diana Donkoh	At post
11	Communications Director	Winrock	Abdul Wahab Gibrilu	At post
12	Gender Integration Specialist	Winrock	Diana Ndego	At post
13	Behavior Change Communications Specialist	Winrock	Abdul-Wahab Musah	At post
14	Grants Manager	Winrock	Modesta Asooh	At post
15	Geographic Information Systems Specialist	Winrock	Eric Forson	At post
16	Natural Resource Management/Multiple Use Water Systems Specialist	Winrock	Bright Boye Kumordzi	At post
17	Driver	Winrock	Michael Boakye	At post
18	Driver	Winrock	Julius Akolibila	At post
19	Driver	Winrock	Abdulai Seidu	At post

20	Driver	Winrock	Kyei Baffour	Assumed post on August 7, 2017
21	Driver	Winrock	Zakaria Asaah	At post
22	Driver	Winrock	Issah Ahmed	At post
23	M&E Officer	Winrock	David Oppong	At post
24	M&E Officer	Winrock	Nelson Osei	At post
25	Finance and Administrative Officer	Winrock	Musah Wuniche Abukari	Assumed post on August 7, 2017
26	Outcomes 1 & 2 Team Leader	TechnoServe	Kpebesaan Delle	Assumed post on July 17, 2017
27	Value Chain Expert (VCE) – Key Personnel	TechnoServe	Abdulai Abdul Nafeo	At post
28	Food Security and Agronomy (FS&A) Expert – Key Personnel	TechnoServe	Stella Obanyi-Brobbe	Assumed post on July 17, 2017
29	Market Strengthening Lead (MSL)	TechnoServe	Ruth Wallace	At post
30	Business Advisor	TechnoServe	Patricia Layo Matey-Akuffo	At post
31	Business Advisor	TechnoServe	Owusu Sampah	At post
32	Business Advisor	TechnoServe	Eric Ayamga	At post
33	Business Advisor	TechnoServe	Felix Ayambire	At post
34	Business Advisor	TechnoServe	James Kpengoy Dakora	At post
35	Business Advisor	TechnoServe	Christian Koduah	At post
36	Business Advisor	TechnoServe	Erik Heinno Botir	At post
37	Senior Business Advisor, Collector Groups	TechnoServe	Michael Kweku Dorgor	At post
38	Nutrition & Economic Empowerment Expert	TechnoServe	Christiana Yakubu	At post
39	Finance Lead	TechnoServe	Philemon Sumbo	At post
40	Business Advisor	TechnoServe	Joseph Addah Kantuwine	At post
41	Field Officer	NCRC	Thomas Awini	At post
42	Field Coordinator	NCRC	Haruna Eluysu	At post
43	Field Officer	NCRC	Sulamana Bawa	At post

44	Field Officer	NCRC	Dorcas Akanlugwai	At post
45	Team leader	CECOTAPS	Clement Aapengnuo	At post – Damongo
46	Programs Officer	CECOTAPS	Frank Dugasseh Akowuge	At post - Damongo
47	Field Officer	CECOTAPS	Bede Anyoka	At post – Damongo
48	Field Officer	CECOTAPS	Alpius Dery	At post – Damongo
49	M&E Officer	CECOTAPS	Anita Zimpah	At post – Damongo
50	Field Officer/ Communications	CECOTAPS	Richard Forgor	At post - Damongo
51	Finance Officer	CECOTAPS	Medrid Donneyong	At post – Damongo
52	Secretary	CECOTAPS	Felicity Aburiya	At post – Damongo
53	Cashier/ Reception	CECOTAPS	Juliana Kpeno	At post – Damongo
54	Junior Business Advisor	TechnoServe	Madona Donneyong	At post
55	Business Advisor	TechnoServe	Blessilla Na-Afoe Kandoh	At post
56	Senior Business Advisor	TechnoServe	Samuel Atia Ayamga	At post
57	Senior Business Advisor	TechnoServe	Letitia Sampoia Apam	At post
58	Contract Driver	Winrock	Ernest Tug – Uu	At post

## Annex H: AgNRM AFOLU Calculator Reports – FY 201

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# AFOLU Carbon Calculator Project Report

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## Ghana AgNRM

Submitted by: Lauren Keller



October 26, 2017

USAID reporting: No

### Project Summary

Component 1,2, and 4

Table 1: Summary of project activities

Name		Location	Type	Area	Benefit t CO <sub>2</sub>	
Zukpiri Core Zone		Ghana	Upper West	Forest Protection	7,800	<b>25</b>
Wechiau Core Zone		Ghana	Upper West	Forest Protection	4,235	<b>14</b>
<b>Total</b>				<b>12,035</b>	<b>39</b>	

## Activity Reports

The following pages give descriptions of each activity in this project. Each activity description includes:

- a high-level summary of the activity for the reporting year
- the projected benefits for this activity (if inputs are complete)
- a list of the parameters used by the calculator

Note that an asterisk ( \* ) indicates that a default value for that parameter was provided by the calculator.

**Activity Name:** Zukpiri Core Zone

**Activity Name:** Zukpiri Core Zone

**Summary**

**Type** Forest Protection  
**Year** 2017  
**Area** 7,800 hectares  
**Benefits** 25 tons CO<sub>2</sub> equivalent  
**Location**  Ghana, Upper West

**Projected Benefits**

Year	Estimated effectiveness for avoided deforestation and logging (%)	Annual benefit from avoided deforestation (t CO <sub>2</sub> )	Annual benefit from illegal logging (t CO <sub>2</sub> )	Estimated effectiveness for avoided fire (%)	Annual benefit from avoided fire (t CO <sub>2</sub> )	Annual emission from community offtake (t CO <sub>2</sub> )	Total Annual Benefit (t CO <sub>2</sub> )	Cumulative Benefit (t CO <sub>2</sub> )
2017	10	25	0	20	0	0	25	25
2018	20	75	0	40	0	0	75	100
2019	30	150	0	60	0	0	150	249
2020	40	249	0	80	0	0	249	498
2021	40	348	0	80	0	0	348	846
2022	40	447	0	80	0	0	447	1,293
2023	40	546	0	80	0	0	546	1,839
2024	40	644	0	80	0	0	644	2,483
2025	40	743	0	80	0	0	743	3,225
2026	40	841	0	80	0	0	841	4,066
2027	40	939	0	80	0	0	939	5,005
2028	40	1,037	0	80	0	0	1,037	6,041
2029	40	1,134	0	80	0	0	1,134	7,176
2030	40	1,232	0	80	0	0	1,232	8,407
2031	40	1,329	0	80	0	0	1,329	9,736
2032	40	1,426	0	80	0	0	1,426	11,163
2033	40	1,523	0	80	0	0	1,523	12,686
2034	40	1,620	0	80	0	0	1,620	14,305
2035	40	1,716	0	80	0	0	1,716	16,022
2036	40	1,813	0	80	0	0	1,813	17,835
2037	40	1,279	0	80	0	0	1,279	19,103
2038	40	1,344	0	80	0	0	1,344	20,415
2039	40	1,408	0	80	0	0	1,408	21,760
2040	40	1,472	0	80	0	0	1,472	23,126
2041	40	1,536	0	80	0	0	1,536	24,514
2042	40	1,600	0	80	0	0	1,600	25,925



## Activity Name: Zukpiri Core Zone

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2043	40	1,664	0	80	0	0	1,664	27,357
2044	40	1,727	0	80	0	0	1,727	28,811
2045	40	1,791	0	80	0	0	1,791	30,287
2046	40	1,854	0	80	0	0	1,854	31,785

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### Inputs

- **Required Inputs:**

- **Name:** Zukpiri Core Zone
- **Forest type:** Forests
- **Avoided actions:** Fire, Deforestation, Illegal logging
- **Effectiveness:**
  - **Effectiveness in avoiding fire:** 80 %
  - **Effectiveness percent of override:**
  - **Effectiveness in avoiding deforestation/ illegal logging:** 40 %
  - **Effectiveness percent of override:**
  - **Age of project:** 1 years
  - **Years until full effectiveness:** 4 years

- **Advanced Inputs:**

- **Deforestation:**
  - **Deforestation Rate Before Intervention:** 0.31 %/yr \*
  - **Deforestation Rate After Intervention:** Not specified %/yr
  - **Annual Forest Growth (<20 olinebreak years):** 1.9 t C/ha \*
  - **Annual Forest Growth (>20 olinebreak years):** 0.7 t C/ha \*
  - **Soil Carbon Stock:** 38.99 t C/ha \*
- **Forest Characteristics:**
  - **Forest Carbon Stock:** 0.0 t C/ha \*
- **Community offtake during project implementation:**
  - **Community Area:** 0.0 ha \*
  - **Annual Community Wood Extraction Rate:** 0.0 m<sup>3</sup>/ha \*
- **Illegal Logging:**
  - :
  - **Illegal Fraction Before Intervention:** 0.0 % \*
  - **Or:**
    - **Total extraction rate before intervention:** Not specified m<sup>3</sup>/ha
  - **Wood density:** 0.57 g/cm<sup>3</sup> \*

**Activity Name:** Zukpiri Core Zone

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– **Fire:**

- **Annual Fire Frequency Before Intervention:** 0.0 fraction/yr \*

– **Peat Swamp Forests:**

- **Peat Swamp Percentage:** 0.0 % \*
- **Peat Carbon Density:** 0.06 g/cm<sup>3</sup> \*
- **Initial Burn Depth:** 0.15 m \*
- **Average Depth of Peat Drained:** 0.6 m \*
- **Average Depth of Peat Burned:** 0.15 m \*

– **Mangrove Deforestation:**

- **Mangrove Deforestation Rate Before Intervention:** Not specified %/yr
- **Mangrove Deforestation Rate After Intervention:** Not specified %/yr
- **Mangrove Growth:** Not specified t C/ha
- **Mangrove Carbon:** 0.0 t C/ha \*

● **Notes:**

– **Notes:**

**Activity Name: Wechiau Core Zone**

**Activity Name: Wechiau Core Zone**

**Summary**

**Type** Forest Protection  
**Year** 2017  
**Area** 4,235 hectares  
**Benefits** 14 tons CO<sub>2</sub> equivalent  
**Location**  Ghana, Upper West

**Projected Benefits**

Year	Estimated effectiveness for avoided deforestation and logging (%)	Annual benefit from avoided deforestation (t CO <sub>2</sub> )	Annual benefit from avoided illegal logging (t CO <sub>2</sub> )	Estimated effectiveness for avoided fire (%)	Annual benefit from avoided fire (t CO <sub>2</sub> )	Annual emission from community offtake (t CO <sub>2</sub> )	Total Annual Benefit (t CO <sub>2</sub> )	Cumulative Benefit (t CO <sub>2</sub> )
2017	10	14	0	10	0	0	14	14
2018	20	41	0	20	0	0	41	54
2019	30	81	0	30	0	0	81	135
2020	40	135	0	40	0	0	135	271
2021	40	189	0	40	0	0	189	459
2022	40	243	0	40	0	0	243	702
2023	40	296	0	40	0	0	296	998
2024	40	350	0	40	0	0	350	1,348
2025	40	403	0	40	0	0	403	1,751
2026	40	456	0	40	0	0	456	2,208
2027	40	510	0	40	0	0	510	2,717
2028	40	563	0	40	0	0	563	3,280
2029	40	616	0	40	0	0	616	3,896
2030	40	669	0	40	0	0	669	4,565
2031	40	722	0	40	0	0	722	5,286
2032	40	774	0	40	0	0	774	6,061
2033	40	827	0	40	0	0	827	6,887
2034	40	879	0	40	0	0	879	7,767
2035	40	932	0	40	0	0	932	8,699
2036	40	984	0	40	0	0	984	9,683
2037	40	695	0	40	0	0	695	10,372
2038	40	729	0	40	0	0	729	11,084
2039	40	764	0	40	0	0	764	11,814
2040	40	799	0	40	0	0	799	12,556
2041	40	834	0	40	0	0	834	13,310
2042	40	869	0	40	0	0	869	14,076

## Activity Name: Wechiau Core Zone

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2043	40	903	0	40	0	0	903	14,853
2044	40	938	0	40	0	0	938	15,643
2045	40	972	0	40	0	0	972	16,444
2046	40	1,007	0	40	0	0	1,007	17,257

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### Inputs

- **Required Inputs:**

- **Name:** Wechiau Core Zone
- **Forest type:** Forests
- **Avoided actions:** Fire, Deforestation, Illegal logging
- **Effectiveness:**
  - **Effectiveness in avoiding fire:** 40 %
  - **Effectivepercent af override:**
  - **Effectiveness in avoiding deforestation/ illegal logging:** 40 %
  - **Effectivepercent adil override:**
  - **Age of project:** 1 years
  - **Years until full effectiveness:** 4 years

- **Advanced Inputs:**

- **Deforestation:**
  - **Deforestation Rate Before Intervention:** 0.31 %/yr \*
  - **Deforestation Rate After Intervention:** Not specified %/yr
  - **Annual Forest Growth (<20 olinebreak years):** 1.9 t C/ha \*
  - **Annual Forest Growth (>20 olinebreak years):** 0.7 t C/ha \*
  - **Soil Carbon Stock:** 38.99 t C/ha \*
- **Forest Characteristics:**
  - **Forest Carbon Stock:** 0.0 t C/ha \*
- **Community offtake during project implementation:**
  - **Community Area:** 0.0 ha \*
  - **Annual Community Wood Extraction Rate:** 0.0 m<sup>3</sup>/ha \*
- **Illegal Logging:**
  - :
  - **Illegal Fraction Before Intervention:** 0.0 % \*
  - **Or:**
    - **Total extraction rate before intervention:** Not specified m<sup>3</sup>/ha
  - **Wood density:** 0.57 g/cm<sup>3</sup> \*

**Activity Name:** Wechiau Core Zone

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– **Fire:**

- **Annual Fire Frequency Before Intervention:** 0.0 fraction/yr \*

– **Peat Swamp Forests:**

- **Peat Swamp Percentage:** 0.0 % \*
- **Peat Carbon Density:** 0.06 g/cm<sup>3</sup> \*
- **Initial Burn Depth:** 0.15 m \*
- **Average Depth of Peat Drained:** 0.6 m \*
- **Average Depth of Peat Burned:** 0.15 m \*

– **Mangrove Deforestation:**

- **Mangrove Deforestation Rate Before Intervention:** Not specified %/yr
- **Mangrove Deforestation Rate After Intervention:** Not specified %/yr
- **Mangrove Growth:** Not specified t C/ha
- **Mangrove Carbon:** 0.0 t C/ha \*

● **Notes:**

– **Notes:**

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# AFOLU Carbon Calculator Project Report

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## Ghana AgNRM Year 1



Submitted by: Lara Murray

October 25, 2017

USAID reporting: No

### Project Summary

Table 1: Summary of project activities

Name		Location		Type	Area	Benefit t CO <sub>2</sub>
Moringa planting in fallow		Ghana	Northern	Afforestation/ Reforestation	4	<b>4</b>
Moringa Agroforestry		Ghana	Northern	Agroforestry	30	<b>130</b>
				<b>Total</b>	<b>34</b>	<b>134</b>

## Activity Reports

The following pages give descriptions of each activity in this project. Each activity description includes:

- a high-level summary of the activity for the reporting year
- the projected benefits for this activity (if inputs are complete)
- a list of the parameters used by the calculator


Note that an asterisk ( \* ) indicates that a default value for that parameter was provided by the calculator.

**Activity Name:** Moringa planting in fallow

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**Activity Name:** Moringa planting in fallow

**Summary**

**Type** Afforestation/Reforestation  
**Year** 2018  
**Area** 4 hectares  
**Benefits** 4 tons CO<sub>2</sub> equivalent  
**Location**  Ghana, Northern

**Projected Benefits**

<b>Year</b>	<b>Estimated Effectiveness (%)</b>	<b>Total Annual Benefit (t CO<sub>2</sub>)</b>	<b>Cumulative Benefit (t CO<sub>2</sub>)</b>
2018	50	4	4
2019	50	19	23
2020	50	36	59
2021	50	52	111
2022	50	65	176
2023	50	76	252
2024	50	84	336
2025	50	89	424
2026	50	92	516
2027	50	93	609
2028	50	92	701
2029	50	90	792
2030	50	88	879
2031	50	84	964
2032	50	80	1,044
2033	50	76	1,120
2034	50	72	1,192
2035	50	67	1,259
2036	50	63	1,322
2037	50	58	1,380
2038	50	54	1,435
2039	50	50	1,485
2040	50	46	1,531
2041	50	42	1,573
2042	50	39	1,612
2043	50	36	1,648
2044	50	33	1,681
2045	50	30	1,711
2046	50	27	1,738
2047	50	25	1,763



## Activity Name: Moringa planting in fallow

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### Inputs

- **Required Inputs:**
  - **Name:** Moringa planting in fallow
  - **Effective Percent:** 50 %
  - **Effective Percent Override:** Guided effectiveness: 100;  
Justification: The project is in early stages of development, and thus a conservative effectiveness rate has been adopted.;
  
  - **Species Type:** Plantations\_Tropical\_moist-wet\_Pterocarpus
- **Advanced Inputs:**
  - **Carbon accumulation rate:** Not specified t C/ha-1
  - **Age of plantation:** 1 years \*
- **Notes:**
  - **Notes:**

**Activity Name:** Moringa Agroforestry

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**Activity Name:** Moringa Agroforestry

**Summary**

**Type** Agroforestry  
**Year** 2018  
**Area** 30 hectares  
**Benefits** 130 tons CO<sub>2</sub> equivalent  
**Location**  Ghana, Northern

**Projected Benefits**

<b>Year</b>	<b>Estimated Effectiveness (%)</b>	<b>Total Annual Benefit (t CO<sub>2</sub>)</b>	<b>Cumulative Benefit (t CO<sub>2</sub>)</b>
2018	50	130	130
2019	50	130	259
2020	50	130	389
2021	50	130	519
2022	50	130	648
2023	50	130	778
2024	50	130	908
2025	50	130	1,038
2026	50	130	1,167
2027	50	130	1,297
2028	50	130	1,427
2029	50	130	1,556
2030	50	130	1,686
2031	50	130	1,816
2032	50	130	1,945
2033	50	130	2,075
2034	50	130	2,205
2035	50	130	2,335
2036	50	130	2,464
2037	50	130	2,594
2038	50	130	2,724
2039	50	130	2,853
2040	50	130	2,983
2041	50	130	3,113
2042	50	130	3,242
2043	50	130	3,372
2044	50	130	3,502
2045	50	130	3,632
2046	50	130	3,761
2047	50	130	3,891

## Activity Name: Moringa Agroforestry

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### Inputs

- **Required Inputs:**
  - **Name:** Moringa Agroforestry
  - **Effective Percent:** 50 %
  - **Effective Percent Override:** Guided effectiveness: 100;  
Justification: The project is in early stages of implementation, and thus a conservative effectiveness rate has been applied.;
  
- **Advanced Inputs:**
  - **Agroforestry Type:** Tree-Intercropping
  - **Age of plantation:** 1 years
  - **Carbon accumulation rate:** 2.37 t C/ha-1 \*
  
- **Notes:**
  - **Notes:**