

Report of Impact Assessment

Subaward Agreement Number: **RFH RR 33430S010**



June, 2022

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1 Introduction

1.1 Background

Rural Farmers Hub (RFH) is a business innovation leveraging ICT (*mobile phones & big data*) to support farmers, corporates and industries to make better agribusiness decisions through data-driven and precision advisory services on improving crop yield and market linkages. It was founded in 2018 by Segun Adegun, a development professional, and Gabriel Eze, a tech professional and commercial farmer. Both founders come from farming backgrounds and were inspired to start RFH after witnessing persistently low yields and a lack of agricultural support services in their home villages.

Private extension service providers tend to ignore smallholder farmers, who are the groups most in need of crop advisory, and rather focus on larger and more profitable farmers. Our proposal is the expansion of our proven (extension) business model of bundling of crop advisory services with the sale of other complimentary farm inputs and digital financial service products by village-based extension agents (EAs) through a physical/home kiosk with a digital management tool. The extension agent, using our digital tools, can function at the highest level of productivity, and service even more farmers at scale. She/he will serve as a conduit for stepping down the learning curve for farmers, lowering any barriers to access/use new, improved agricultural technologies and digital tools that will help farmers and market actors save time and cost while increasing productivity.

Extension agents, through our automated advisory tool, help smallholder farmers in the target states to remotely watch and analyse crop performance such as crop health monitoring, soil nutrient mapping with precise yield-based fertiliser recommendation, pre-planting planning for ecological advantage, and predictive analytics and placing orders for farm inputs on behalf of the farmers she/he is servicing. Similarly, the farmer also receives weather analytics (such as 5-day weekly forecast, seasonal forecast, optimal planting date prediction, pest and disease management, water stress, and soil condition).

1.2 RFH Business Model

RFH's core product offering is Capture, a crop and soil health advisory service, which costs approx. 2,500 naira per hectare a month or 10,000 naira per hectare for a season (calculated as 6 months max). Once farmers have been registered on our platform, RFH is also able to offer them additional agricultural services based on their needs (machine

rental, fertiliser sales, etc). Some of these services are currently operational which can bring in up to 50,000 naira in additional revenue per user.

1.2.1 Capture App

Capture is a data platform for precisely monitoring and managing soil and crop status using remotely sensed data. It smartly combines soil, crop and climate data into powerful insights for farmers or organisations that support farmers, leading to improved soil quality and crop yield, while helping government & corporates make better farming-related policy and business decisions. We have the best in class software design in precision farming, combining big data with best agronomic data that is processed through our proprietary algorithm and can be delivered to the user via SMS, voice call, mobile app or in person.



Capture provides the following insights:

- Soil physical properties: Texture (via % content of clay, sand, silt, and stone), Bulk density, Slope angle, etc
- Soil chemical properties: Aluminium, Carbon, Nitrogen, Organic matter, pH, Cation Exchange Capacity Nitrogen, etc
- Other properties: Phosphorus, Potassium, Calcium, Iron, Magnesium, Sulphur, Zinc, etc
- Soil fertility map with precise yield-based fertiliser recommendation
- Decision support system for crop health monitoring
- Weather and climate data

All these are provisioned in a single dashboard. Sources of data includes: satellite, SAR/radar, agronomic research, and abstractions (synthesised data). The output is

then post-processed relative to the BBCH-scale for a realtime, personalised precision advisory.

1.2.2 Pay Later (a ‘Discount-on-Hold’ Pricing Approach)

For digital services like ours, farmers struggle to pay the full fee because it is new to them (mostly). To reduce this barrier, we implemented a “pay later” model and this is how it works: For first-time farmers, we split the fee into 2 parts: we charge only 10% upfront and 90% post harvest. In other words, N1,000 per hectare gets you started. Where a farmer did not achieve the desired yield expectation, they don’t need to pay the remaining 90%. The attendant benefits is that we position our business model in lockstep with farmer impact; where successful, this result is improved yield with better outputs leading to improved income and livelihoods.

1.2.3 Access to Farm Inputs

During the needs assessment we conducted before designing our program, the farmers identified poor quality of inputs as a challenge and the limited availability of good farm inputs in the market, the delay in securing the inputs and the prices which were unaffordable for some SHFs. By facilitating, timely, quality and credit facilities, farmers are expected to have “all they need to realise their full potentials”.

1.2.4 Cost of Service Delivery

Using a combination of Capture app and periodic meetings with farmers, 1 extension agent spends an average of 13,200 naira per month in order to provide personalised precision advisory and extension service. The average number of farmers served using this approach by 1 extension agent is 65 where the farmer meets face-to-face at least once per week or at least 4 times per month. This resulted in monthly unit cost of service provision per farmer of N203 (excluding software licensing/subscription costs. Below is a breakdown of how the costs was derived;

- 3,200 naira per month on the average is spent on internet subscription that enables them to access the Capture app (RFH’s climate-smart tool)
- For their mobility (bike or car), the average monthly cost is 10,000 naira; however, this is projected to increase if the Federal government of Nigeria goes ahead with the removal of fuel subsidy in the coming year
- In contrast, if the agent is to visit each farmer personally (an ideal situation that compares with methodology), it will cost 2,250 naira per farmer for at least 1 farm visit per month. At 65 farmers, that will amount to an average of 146,250 naira per month to service all 65 farmers.

- It can be argued that traditional farmer group meetings are a cheaper alternative to the pilot. However, without the data-driven and personalised crop advice, the uncertainty and unpredictability of crop yield creeps in. During such traditional meetings, additional cost may be incurred if refreshment (customary), external trainers and experts are to be included.

| Cost to Service 1 Farmer | Pilot Approach via Capture (Weekly check-in & Capture app) | Legacy Approach (Monthly check-in on farm) |
|--------------------------|--|--|
| Monthly | N200 | N2,250 |
| Annually | N2,500 | N27,000 |

Whether or not fuel price rises due to subsidy removal, our approach to extension delivery is still cheaper (see table above). At an annualised software subscription rate of N10,000 per unit/farmer, our offering is 54% cheaper than the legacy approach.

This evaluation, conducted from June 21st to June 28th 2022, is intended to provide an examination of the overall progress and accomplishments of the project to determine whether the assistance provided by USAID (United States Agency for International Development) through Mercy Corps Rural Resilience Activity Enterprise Innovation Fund achieved its development objectives.

2 Impact Survey

2.1 Objectives of the study

Rural Farmers Hub set out to demonstrate and understand the impact of Capture solution and share what lessons can be learnt from the implementation of her activities in Borno, Adamawa, Yobe, and Gombe States. The specific objectives are as follows:

- i. Further the uptake of e-extension services (via precision farming),
- ii. Increase income of agents with a focus on achieving a gender representation,
- iii. Uptake of digital finance service (DFS) and other complimentary products.

2.2 Sample selection Process

All the respondents for this impact survey were drawn from the network of extension agents recruited for this RRA batch. The sample selection was distributed across intervention states comprising five (5) farmers and three (3) extension agents. It also included a parallel interview of two (2) staff members and one (1) management member of Rural Farmers Hub. The sample size of the farmers was considerably small compared to the total size of the population under this intervention. The reason was that the majority of the farmers were yet to harvest their produce at the time this evaluation was conducted, most especially as the project and reporting must be closed by that same time too. The optimal planting condition materialised in mid February, an information we had communicated to the farmers via SMS in December 2021 and January 2022.

2.3 Data collection instruments

A closed-ended interview questionnaire was used to conduct a quantitative survey. Each respondent was required to complete the interview by answering questions that will help measure to what extent Rural Farmers Hub achieved the objectives of the RRA. The questions are coded into Rural Farmers Hub's '**Baseline**' app, a software instrument for android phones. This pathway helped to achieve faster and accurate data collection by directly synchronising with the Capture database; eliminating the possibility of interviewing the wrong farmer/respondent. Key Informant Interviews were also conducted to validate the quantitative data collected.

2.4 Data Quality Control

To ensure data quality and control, the '**Baseline**' app connects directly to the Capture app database, ensuring that configurations and conformity of data collected remain constant throughout the process. Furthermore, the enumerator worked directly with the Operations Manager (based in Borno) as well as the officers and extension agents in each of the intervention states to ensure smooth interfacing with farmers.

3 Results & Findings

The implementation of RRA by Rural Farmers Hub was inhibited from the start. Work plan was developed to commence intervention in the rainfed season of 2021, however, activities could not be started as the Enterprise Innovation Fund (EIF) contract award for the Rural Resilience Activity (RRA) was executed and commenced in August 2021, just as the rainy season was winding down. Important and time-bound activities such as mapping of farmlands, which are precursors to deliver climate-smart advisory, did not happen.

At the preparatory stage prior to the execution of this contract, Rural Farmers Hub was assured that there's data of farmers with GPS coordinates of their farmlands who are previous beneficiaries of RRA. This database was shared with Rural Farmers Hub only after contract execution; however, the GPS coordinates were that of the homes of the 'farmers'. Also, a significant number are not into crop production or recently retired from the venture.

This leaves only one (1) option: identifying new farmers and mapping their farms. This activity is a highly laborious physical one as indicated in the full application submitted in May 2021. This concern was also raised to the visiting RRA team at the office of Rural Farmers Hub in Abuja during their supervisory tour in December 2021 which was acknowledged but not documented.

These challenges altered the course of the implementation of the work plan throughout the project time. As resilience will demand, Rural Farmers Hub was able to accomplish some results during the dry/irrigated farming window in 2022.

3.1 Input Sales

Rural Farmers Hub struggled to find partners/vendors to supply fertiliser to farmers for dry season 2021/2022; as a result, did not meet this obligation for the period of intervention. Eventually, this obligation was met but for the wet season of 2022 which is outside the scope of this engagement. 171,700 kilograms of NPK 20:10:10 fertiliser representing 3,435 bags (50 kg/bag) was supplied to registered farmers/customers of Rural Farmers Hub. Over 1,000 kilograms of FARO 44 rice seed variety was also supplied. All sales are direct, no credit/loan. Here's the breakdown of sales by state:

| States | Volume (kilogram) | % (by Volume) |
|---------|----------------------|------------------|
| Borno | 75,000 | 43.68% |
| Adamawa | 10,000 | 5.82% |

| | | |
|--------------|----------------|-------------|
| Yobe | 3,200 | 1.86% |
| Gombe | 83,500 | 48.63% |
| Total | 171,700 | 100% |

| Month | Category | Sales Breakdown (NGN) | Total Sales (NGN) | % (by Volume by sales) |
|----------|--------------------------------|---------------------------------------|----------------------|------------------------------|
| Jan 2022 | Subscription Seed | 60,000 10,200 135,700 24,000 | 333,100 | 0.79% |
| Feb 2022 | Subscription Seed Others | 717,000 12,500 21,000 | 750,500 | 1.79% |
| Mar 2022 | Subscription Seed Others | 319,500 68,500 | 431,500 | 1.03% |
| Apr 2022 | Subscription Others | 133,000 32,000 | 165,000 | 0.39% |
| May 2022 | Subscription Seed | 60,000 10,200 | 229,900 | 0.55% |

| | | | | |
|--------------|--------------|------------|-----------------------|-------------|
| | Fertiliser | 135,700 | | |
| | Others | 24,000 | | |
| Jun 2022 | Subscription | 1,000 | 22,462,600 | 53.58% |
| | Seed | 95,000 | | |
| | Fertiliser | 21,403,000 | | |
| | Herbicide | 963,600 | | |
| Jul 2022 | Seed | 47,500 | 8,560,300 | 20.43% |
| | Fertiliser | 8,499,800 | | |
| | Others | 13,000 | | |
| Aug 2022 | Borno | 3,861,200 | 5,880,100 | 14.02% |
| | Adamawa | 153,800 | | |
| | Yobe | 974,100 | | |
| | Gombe | 891,000 | | |
| Sep 2022 | Borno | 2,450,000 | 3,113,900 | 7.43% |
| | Adamawa | 0 | | |
| | Yobe | 11,600 | | |
| | Gombe | 548,800 | | |
| Total | | | NGN 41,926,900 | 100% |

Note: All sales in August and September are fertiliser only

3.2 Precision and climate-smart advisory services

At the onset of irrigated farming 2021/2022, 1,269 farmers received climate-smart advisory; the advice was a critical warning on climate change and the urgency to delay planting of rice till mid-February of 2022. The warning also came with the good news of favourable weather conditions for wheat (outside the scope of the value chains) but useful information anyways. Reception was good at the initials but frustration on accessing fertiliser overshadowed this gain in the coming months.

All farmers whose farms had been mapped are subscribed to the 'pay later' model. As more farmers are onboarded (i.e. when farm is mapped), they will start receiving such related advisory immediately as it is automated.

| | Total SMS sent / Advisory delivered | # males | # female |
|---------------|--|--------------|--------------|
| December 2021 | 1,269 | - | - |
| January 2022 | 3,109 | 2,517 | 592 |
| February 2022 | 3,109 | 2,517 | 592 |
| March 2022 | 56 | 46 | 10 |
| April 2022 | 1,789 | 1,465 | 324 |
| Total | 9,332 | 6,545 | 2,787 |
| | | 70.14% | 29.86% |

Empirical observation shows that there's a direct correlation between farmer interest in information services and access to the requisite inputs required to apply those information. The inability of Rural Farmers Hub to find input partners/vendors in time needed for farming, especially fertilisers, led to mass disinterest in any advisory service. Although efforts have been made towards making the input available, the only option RFH could secure was 50 bags from Meadow Foods which was released quite very late (May 2022 ending).

3.3 Farmer Acceptance of the Business Model

Majority of farmers don't earn a living wage from farming alone, 89% of them say they are engaged in other activities (outside working on their own farm) to earn

supplemental income. It is our goal to reduce the dependence of farmers on such secondary activities by boosting their individual and crop productivity. Unfortunately, the odds of accomplishing this were much higher than anticipated for reasons initially highlighted at the beginning of this section.

Following months of stakeholder engagement across the four (4) states of intervention, farmer enthusiasm with Rural Farmers Hub was high (still is) vis-a-vis the promise of the possibility of boosting crop productivity. Acceptance was high as this was reflected in the willingness of farmers to pay the upfront 1,000 naira out of the 10,000 naira per hectare fee. Within the first month, sales momentum was growing fast resulting in an accumulated subscription revenue of 5,499,000 naira by the end of 2021.

Soon, farmers began sharing other needs of theirs such as lack of portable drinking water, credit for inputs (loan), among others. In response to these demands, extension agents (out of their individual volition and without authorisation from Rural Farmers Hub), were promising farmers that the company would give them loan. This was a turning point for us as the loan that was not promised became a source of discontent and bitterness; farmers pressuring the extension agents who in turn are now pressuring Rural Farmers Hub.

A series of reconciliatory meetings were held across affected locations, the conclusion was as follows;

- Aggrieved farmers, who are subscribers, can request for a refund of 1,000 naira advanced to Rural Farmers Hub. During sensitisation, the farmers were assured of a money-back policy within the company that can be invoked.
- Where farmers did not opt for a refund, their service period is extended by another season without any additional charge.

As of the time of this report, there were no refund requests arising from this dispute. The only refund to farmers was at Maiduguri and a part of Jere in Borno state where there was an insignificant dry season farming activity. So far, farmer acceptance of this business model is good, especially in Borno state.

3.4 Impact of Rural Resilience Activity Investment

From initial engagements with village stakeholders and farmers, the body language at the mention of Mercy Corps was suggesting '**free money**' leading to some entitlement mentality. This can be attributed to decades of interventions in the region by nongovernmental organisations that were not driven from a commercial standpoint. This however, eroded quickly with clear target communication and instant demonstration of value.

As a “for-profit” company, the investment in, and participation of Rural Farmers Hub in the Rural Resilience Activities meant a significant bump in the customer base (nearly 500 percent). Revenue also grew by about 10% in the period under review. This traction helped support the company

3.5 Off-aking

Rural Farmers Hub linked some groups of farmers in Yobe and Borno states to oftakers for rice and “beans+groundnut” value chains respectively. The deal did not materialise as buyer and seller could not agree on price.

4 Analysis of the Findings

4.1 Achievements on the Partnership with RRA

Here's a breakdown of how Rural Farmers Hub fared on a milestone by milestone basis;

| Milestone | | Completion Date | | Remark |
|-----------|---|-----------------|-------------------------------|-----------|
| # | Description | Expected | Actual | |
| 1 | Subaward agreement signed and work plan completed and submitted for approval | 30/7/2021 | 2/8/2021 | COMPLETED |
| 2 | Onboarding of 100 agents, in addition to other jobs created and submission of a database of these agents for approval. | 30/8/2021 | 21/9/2021 | COMPLETED |
| 3 | Digital identities and profiles for 10,000 smallholder farmers created and submitted for approval. | 30/9/2021 | 11/4/2022 | COMPLETED |
| 4 | Onboarding of ecosystem market actors and submission for approval | 30/10/2021 | 7/2/2022 | COMPLETED |
| 5 | Youth and women alongside ADP agents receive and use climate-smart agricultural and information, extension and advisory services on GAP | 30/11/2021 | 31/12/2021 To 30/4/2022 | COMPLETED |
| 10 | Customer/Farmer Impact Survey conducted and submitted for approval. | 30/4/2022 | 30/6/2022 | COMPLETED |

From the findings of the survey, 6 of 10 milestones were completed. Assuming each milestone carries equal statistical weight, the completion rate of the Rural Resilience Activity by Rural Farmers Hub is 60%; not the best nor expected outcome, definitely something to build on. By academic grading standard, that would be a B or merit.

4.2 *Lessons from the Program*

4.2.1 *Reliance on partners is good, but have backups*

Partnerships are great but failure of one partner can result in an unexpected exposure to great commercial risks and losses. Rural Farmers Hub relied heavily on input vendors for ready access to farming essentials (e.g. fertiliser, financial services, etc); however, the outcome of such partnerships did not turn out as expected. To mitigate this, Rural Farmers Hub is diversifying its mix of partners especially in the area of credit guarantee for input manufacturers to supply on request without fear of not getting paid. This paid off!

4.2.2 *Hire slow, fire fast*

In striving to meet the deadline for recruiting extension agents across the intervention states, we had to speed up the process; and in the process, we hired wrongly. This is reflected in the high churn rate (75 per cent) of extension agents during the period under review. In the course of this intervention, 176 field staff (extension agents only) were recruited; started with an initial 100 headcount and ended with 45 as at the end June 2022. Needless to say, the majority of those termination/exit were done amicably and on the basis of unmet performance indicators (except for a few).

The salary of extension agents (and every other staff of Rural Farmers Hub) were tied to performance coded into the contract. A lack of understanding of the performance terms in the contract resulted in animosity from a few extension agents when their contract terminated on either performance grounds or insubordination. At the peak of this animosity, one extension agent in Gombe withheld over 100 bags of fertiliser meant for farmers to purchase. Through dialogue and mediation with the agricultural desk officer of the LGA, the matter was resolved.

It is worth noting that the field staff that were found in this type of act are usually the ones that are least performing (in sales) or productivity or both. They are also usually the ones at the lower end of RFH's recruitment ranking. To nip this, we query such staff fast, apply suspension fast, and ultimately fire fast where corrective improvement by the staff is inadequate..

4.2.3 *Inadequate programmatic support from RRA*

Apart from training and workshops, Rural Farmers Hub did not receive significant and tailored operational support. Reports were submitted on a monthly basis from September 2021 to February 2022, then weekly from March to June 2022. Not once was feedback shared by the RRA on ways to improve operations, or on areas that can be improved to increase activity completion rate.

Worthy of note, Rural Farmers Hub appreciates the RRA team for the effort to connect her with the ministry of agriculture in Gombe and Adamawa states. Also, the connection with Meadow Food to provide some succour on the fertiliser supply drought.

Rural Farmers Hub expected more involvement from RRA beyond vetting payment request vouchers and writing cheques. As operators at the high level, there are a handful of levers that could've been deployed to help partners succeed better; for instance, a bit more transparency on past learnings (wins and fails) with current partners can only make the entire north-east ecosystem stronger. It should be okay to point out to partners, in the middle of activities, failure points with recommendations on how to improve them, for these constitute stepping stones (not stumbling blocks).

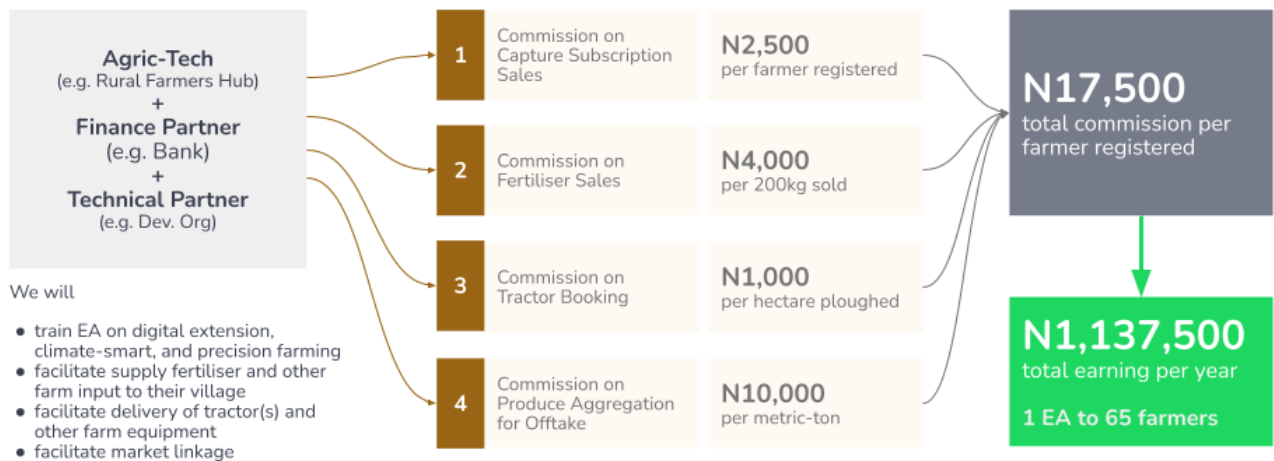
4.3 Market Opportunities

There is a big business opportunity for the use of technology in agriculture in the northeast of Nigeria, especially as communities continue their social and economic recovery post-insurgency. Technology such as Capture can play a role in stimulating rural economy by boosting crop productivity. However, for technology to work efficiently, other non-technology needs such as timely access to quality inputs and financial services at the right price point is key. Rural Farmers Hub will continue to operate in most of the current locations in the northeast region but success is dependent on plugging a few key gaps;

- RFH should strengthen its value proposition by making Capture an end-to-end solution which includes advisory, finance, and marketplace all on its digital platform. It should transition from a specialisation app into a multi-function super app.
- By including financial services, RFH can then revise her compensation model for extension agents from fixed income to commission-based. Agents must be transitioned into entrepreneurs leveraging the company's technology platform to grow and self-manage farmers, keeping all the revenue generated and paying Rural Farmers Hub a tiny fee for using the platform, accessing input supply financing, etc. See image below;

How we secure the job of EAs

How much can an Extension Agent potentially earn using our business model?



- Farmers are overly expectant of humanitarian response due to long periods of exposure to it as a result of insurgency in the intervention states; they want free items and direct loans without collateral. A new business where free interventions are converted into long-term financing implemented by the private sector is a pathway forward. It can help reorient perception of such aids and align such aids for sustainable economic prosperity.

5 Conclusion & Recommendations

Despite all the challenges, the few farmers who participated in the dry season farming reported a considerable level of increase in crop yield. Rural Farmers Hub has already decided to remain in the northeast and continue building the business it started. Should Rural Resilience Activity consider supporting this free-will extension of the engagement in related capacity, taking into account key learning previously highlighted, we can continue to provide resilience to the people in northeast Nigeria. Rural Farmers Hub recommends the following;

- i. As a backup to the supply gaps in fertiliser, RRA should consider bringing in small to medium-scale manufacturers of organic fertiliser into the fold. These kinds of fertiliser are made mainly from locally sourced materials.
- ii. There should be a clear framework for managing relationships between the RRA programs team and partner's team. A tabula rasa methodology leaves room to change and reduces accountability, making it difficult to measure and see what meaningful progression should look like in near-realtime.
- iii. Rural Farmers Hub should explore ways of improving its feedback system with her customers. Often, farmers complain of inability to receive SMS due to technical failure in the delivery system. Channels for by-passing Do-Not-Disturb settings on mobile numbers can help deliver crop-critical warnings and advice to farmers, leaving no farmer behind.
- iv. All the feedback and complaints of the extension agents must be urgently evaluated and remedied. It is a win-win for all.
- v. Introducing digital payment and finance products on top of extension services expands the income band that can be earned by the extension agent. It should be introduced. Similarly, tractor ordering and produce aggregation should be an integral part of the Capture app.

Finally, we appreciate you and yours truly:

Everyone within and outside the RRA who supported this journey.

We recognize the board of directors, staff members, field team, retail managers and extension agents at Rural Farmers Hub; your hard work is paying off. Special mention to all the village heads, district chiefs, and farmers who welcomed us to their various homes and communities. The work is just getting started!