Regenerating our Soils

Cases and success stories from the Regenerative Agriculture through the development of the pulses value chain Project in Embu and Makueni counties of Kenya

Disclaimer and Credits

This publication is produced with the funding support of AGRA as part of IIRR's partnership and contractual obligation towards the implementation of the Regenerative Agriculture project. IIRR has nearly a century of history in participatory, integrated and community-centered development. The Institute, through its 'learning community approach, has for decades documented community project approaches and experiences for purposes of learning, replication and up-scaling.

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ABBREVIATIONS AND ACRONYMS

AGRA   Alliance for a Green Revolution in Africa

CEV   Community Extension Volunteer

CGA   Cereal Growers Association

FAO   Food and Agricultural Organization

IIRR   International Institute of Rural Reconstruction

KALRO   Kenya Agriculture and Livestock Research Organization

RA   Regenerative Agriculture

VBA   Village Based Advisor

WAO   Ward Agricultural Officer

INTRODUCTION

For 16 months, from July 2020 to October 2021, AGRA, with funding from IKEA Foundation, and in partnership with Farm Africa and Cereal Growers Association (CGA), implemented a pilot project entitled "Regenerative agriculture through the development of the pulses value chain" in Embu and Makueni Counties of Kenya. The project sought to address the overall problem of food insecurity while at the same time develop local capacities for the implementation of regenerative agriculture practices. The project supported the strengthening of community level extension services – the Village-Based Advisors (VBAs) – through whom regenerative agriculture practices was promoted. As a third partner, IIRRs component of the programme was to ensure that the key project activities, evidence, lessons, success factors and case studies are documented and disseminated to key stakeholders and the general public, to facilitate replication and scale up of regenerative agriculture practices as a sustainable pathway for resilience building in Africa's agricultural transformation.

Project Objective

Overall, the project sought to achieve increased knowledge and awareness of regenerative agricultural practices, a sustainable VBA business model, and increased adoption of climate smart agricultural technologies and practices by smallholder farmers.

Development impact and reach

The project targeted a total of 20,000 smallholder farmers as direct beneficiaries and 50,000 indirect ones. In Embu county, Farm Africa implemented the project where it worked in four sub-Counties; Manyatta, Runyenjes, Mbeere South and Mbeere North, with the project reaching 10,239 (66% female, 34% male) smallholder farmers and recruiting 134 VBAs. In Makueni, Cereal Growers Association implemented the project where it worked in three sub-Counties; Kaiti, Kibwezi West and Makueni, with the project reaching 14,917 ((73% female, 27% male) smallholder farmers and 114 VBAs recruited.

The Learning process

In the project's partnership framework, IIRR was mandated to drive the learning agenda. The agenda entailed capacity needs assessment for knowledge management for the two implementing partners - Farm Africa and CGA, and which informed the development of two capacity building plans; one for each of the two partners. This was followed by a joint development of knowledge management and dissemination strategy, which prescribed how to capture and disseminate learnings from the RA project. A work plan was then developed to guide this process. The work plan included building the capacity of partners in: writing so readers can understand, through writing clinics, and; IIRR guiding the partners by providing writing guidelines. IIRR also made several coaching and mentoring visits to support the two partners in information management. Additionally, IIRR coordinated exchange learning visits for the two partners to enable them learn from each other. This learning process culminated in a four-day writeshop, which was held in Nairobi from August 31st to 3rd September 2021, to finalize different knowledge products that include case stories, success stories and a business case. At the writeshop, drafts of selected cases, success stories and the business case were put through a four-day intensive and rigorous process of draft presentation, critiquing and re-writing. This was done repeatedly until a final draft was achieved.

Participants at the writeshop.

About this book

This book, therefore, is a compilation of 5 selected case studies and 25 (13 from Makueni and 12 from Embu) success stories from the 16 months Regenerative Agriculture through the development of the pulses value chain pilot project. The stories are presented by County. The cases and success stories were purposely selected focusing on those with best practices in strengthening resilience of the smallholder farmers.

CASE STORIES

Institutionalizing community based advisor extension system in Makueni County

Regina in her farm input shop in Makindu town.

"It's like a dream. I never got an income of more than Ksh 5,000 (about US$45) a week. But this season I earned Ksh 15,000 (about US$136) per week on average from my business," says Regina Kamande Nzioki, a mother of four who runs an agro-dealer shop in Makindu town, Makueni county.

Regina who attributes her change of fortunes to more demand for farm inputs by farmers who have adopted regenerative agriculture practices and technologies, is also a Village Based Advisor (VBA). She says her life changed soon after she got involved in the RA project where she was trained as one of the VBAs. Regina also offers door-to-door vaccinations to poultry farmers and charges Ksh. 10 per chicken. In her farm, she has enjoyed improved production after she applied the RA practices.

Just like her fellow VBAs in the county, Regina has taken the advantage of increased demand by aggregating requests by farmers for improved seed varieties and extension services in the villages. She also sources for output markets for farmers.

Regina is one of the 114 Village Based Advisors trained by the project, through Cereal Growers Association (CGA) in Makueni County. The project aimed at enhancing food security and resilience among small holder farmers in the county through the adoption of Regenerative agriculture practices and technologies.

Challenges of extension gaps

The project's aim was informed by the realization that agricultural extension is very key in the transfer of innovations, knowledge, skills and technologies to farmers. However, like many other counties in Kenya, the extension-to-farmer gap in Makueni County has continued to widen as agricultural technical staff retire without replacement. As per the 2019 census, for instance, the extension-farmer ratio in Makueni County stood at 1: 1099. This is to mean that, one extension staff was serving 1099 farming households.

Besides the extension gap, the Makueni County Integrated Development plan (2017) recognizes enhancing access to production inputs (seeds, fertilizer and pesticides) as a major strategy towards achieving its Outcome 2 on improved food security. However, as per the Strategic Integrated Value Chain Action Plan (SIVCAP), a document developed by Agricultural Sector Development Support program (ASDSP II) to show the factors hindering commercialization of priority value chains in Makueni county, access to production inputs is still a major problem, especially towards agricultural productivity.

Addressing the extension gap

To address this gap in the three sub-counties of Makueni, Kaiti and Kibwezi West, the RA project targeted 10,000 farmers, directly and 50,000 indirectly, through building their capacities, using the VBAs as drivers, on regenerative agriculture practices and technologies, and servicing their farm input demands as they arise.

The project promoted eight regenerative agriculture practices and technologies that included soil and water conservation structures, minimum tillage, use of organic manure, crop rotation, inter-cropping, mulching, cover-cropping and agroforestry.

The village based advisor business model, a community-based extension model, was used to reach farmers for training and servicing their demands. The project, through CGA, trained Regina and her fellow VBAs on RA extension skills, and on linkages with input and service providers along the value chain approach which promoted grain value chains including pigeon peas, cowpeas, green grams, beans, dolichols, maize and sorghum.

The VBA Model Diagram
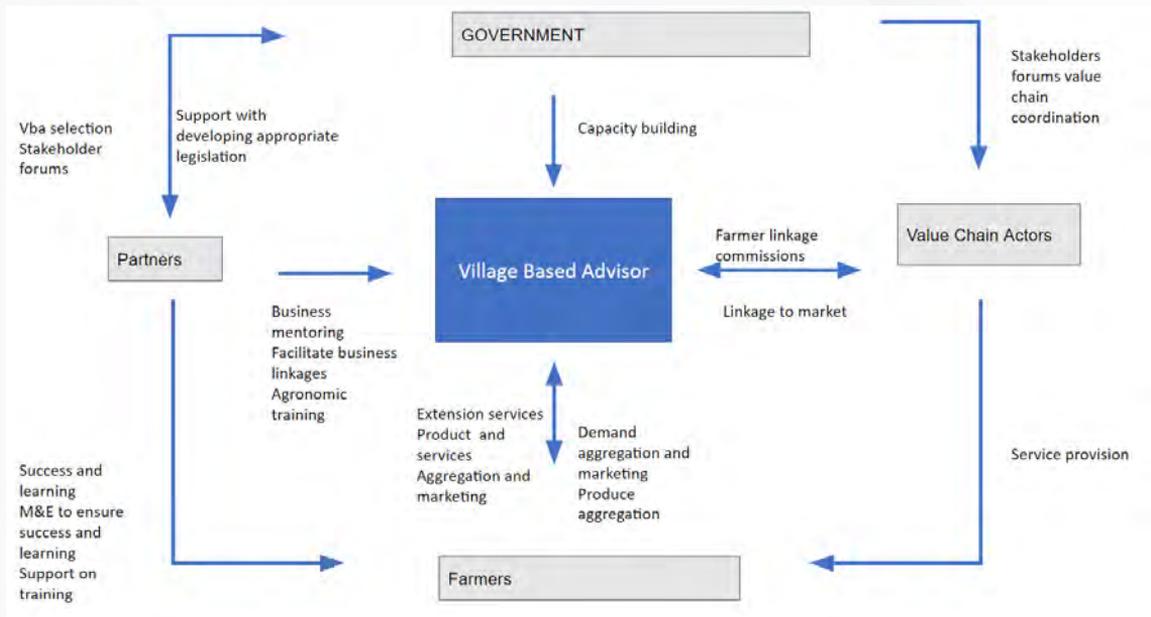
Assessing the needs: CGA kicked off its activities by first conducting a needs assessment. This was meant to assess the farmer needs and establish the magnitude of the extension gap. CGA then engaged the County government's Department of Agriculture, to get their participation and partnership.

Recruitment of VBAs: Following the engagement with the County government, 114 VBAs were recruited from a list of lead farmers. The list of lead farmers was proposed by the County government's department of agriculture.

Training of VBAs: The recruited VBAs were then trained on the RA technologies. The County agricultural officials were also trained alongside the VBAs for the purposes of sensitization and buy-in. At the initial stages the VBAs were trained on RA practices. However, with the progression of the project, they were trained on business skills including record-keeping, business planning, financial management, and entrepreneurship. This was done intentionally to support the VBA model

and its sustainability. Later, at the very end of the training programme, the VBAs were trained on post-harvest and aggregation.

Private partnership: The project also got into partnership with private sector companies, which played a key role in the value chains. This included seed companies, agro-dealers, aggregators, financial institutions and insurance firms. These private sector players supported the project with inputs for the 127 mother and 6,650 baby demo plots.

Training of farmers: The project supported the VBAs in training of 14,005 farmers in the county on RA technologies. The farmers were also trained on business skills. The VBAs established mother-demo plots as training tools. CGA supported the VBAs in the establishment of these mother demos, business mentoring and agronomic training. After the CGA training and support, the VBAs took up the role of training farmers on RA practices and technology. The farmers, after the training, in turn established

baby-demo plots as a confirmation that they had acquired the knowledge and skills for RA practices. The demo plots also served as dissemination tools where farmers converged during farmer field days to learn about RA practices and technologies.

In-put demand-creation: The use of inputs on the demo plots resulted in admirable general outlook of the crops. This attracted the farmers who also wanted to apply similar inputs on their farms to achieve similar results. This created demand for the input, and the VBA came in as the linkage between the farmer and the private sector companies supplying these inputs. From the linkages, the VBAs earned commissions. There were 4 VBAs who were linked to financial institutions while others got linked to insurance companies. The VBAs also offered services to farmers including ripping, spraying and aggregation, at a fee.

Evidence of results

Fridah Muendo, 33, a mother of 3, is one of the 114 lead farmers who were, in July 2020, selected by CGA, through the County government, and trained as a Village Based Advisor (VBA).

Upon completing the training, she helped form the Kinyongo farmers Self Help Group and trained all its 73 members on RA practices and technologies. Using Mother and Baby demonstration plots, Fridah demonstrated to the farmers how to prepare land, space seeds and how to apply manure and crop protection. The farmers also learnt how to use manure, mulching, fertilizer and minimum tillage to help increase production and thus earn more income.

"When the farmers were introduced for the first time to RA practices, they had concerns on its efficacy. Some farmers even opted out of the group. We tried it. When harvest time arrived, we got more yield than expected," says Fridah.

Using the knowledge from the training, Fridah developed entrepreneurial skills and was linked to grain value chain actors. She utilised those skills to set up a store where she off-takes grains from members of Kinyongo farmers Self Help Group, and farmers from the surrounding villages. She also sells post-harvest handling equipment such as hermetic bags, hand shellers and tarpaulins. She has increased her monthly net income from about Ksh 10,000 to Ksh 30,000 (about from US$99 to 297).

"I am currently aggregating beans not only from the 73 farmers but all farmers from the surrounding villages", she adds with a tinge of pride on her face.

Adoption of community based extension model by Makueni County Government.

In July 2021, the Makueni County government introduced its community based extension model, the Community Extension Volunteers (CEVs). This model is anchored within the Makueni Enhanced Extension Volunteer Program (MEEVP), a deliberate effort by the Makueni County Government to enhance community economic empowerment. The model seeks to enhance coordination among the development partners and stakeholders within the county; enhance linkages between actors in the various agriculture value chains; and help in structuring agro–marketing, especially through collective marketing. Through this model, the County has deployed 240 CEVs, 8 from each ward, to assist in enhancing knowledge and skills through training farmers and collecting data from farmers on various aspects and, more so, on production.

Institutionalization of VBAs:

As a result of partnership and collaboration, the County absorbed 20 VBAs into the CEV program. Furthermore, the County invited CGA to give technical advice on the model during introductory meetings for the CEVs. During the meetings, partnerships were mentioned as key towards enhancing the model. The CEV model is similar to the VBA model in many aspects. However, unlike the VBA model where VBAs are engaged indefinitely and are not entitled to any salary, CEVs are engaged on annual basis and are entitled to a stipend of Ksh 4,500 (about US$41) per month.

Analysis of the VBA business model

The VBA model is self-sustaining as the VBAs learn commissions from the linkages and other incomes from various services related to their work. This ensures sustainability of the model. By also being farmers who live within their own communities, they are readily available and trusted by the farmers. This facilitates faster dissemination of knowledge and skills among the farmers.

Smallholder Farmers/Groups	Off-takers
Increased Yield	Stable supply
Improved Knowledge	Increased volumes and quality
Reduced Logistics costs	Improved traceability and monitoring
Established credit history	Increased sourcing efficiency
Better prices through collective sales	Working capital loans
Village based Advisors	**Products and service providers**
Income Streams diversification	Higher value transactions
Increased business capacity	Lower transactions costs
Closing last mile linkage gap	Wider customer pool through VBAs
Connection to key agricultural suppliers	Improved Forecasting
Economies of Scale	Introduction of new products
County Governments	**Partners/Donors**
Higher County productivity	Opportunity to invest in activities aimed at improving local livelihoods through establishing working production and market systems for small holder farmer
Better farmer reach and coordination	
Complementary knowledge transfer system	
Advocacy/policies for adoption of RA	
Platforms for dissemination of RA information	

Lessons from the field

The VBA business model has proven to be a very strong tool in enhancing extension service delivery to farmers. However, a few lessons emerged.

- Set criterion for VBA selection. This could include aspects like level of education, previous work with community, agri-preneurship both in real farming and around the production nodes, attachment to the community, age, among others. The selected VBA should be one that has a strong connection with the community; believes that given the opportunity they can make wealth out of working with the community; obtains pleasure out of helping others grow; and of age less than 50 years. Married youth with well-established farms are more likely to perform well – in the case of targeting the youth.

- Partnerships is paramount to the model. VBAs offer training and ordered items from the service providers on behalf of farmers. They, therefore, require to know (especially know-how on use and efficacy) the products and services well before taking the same to farmers. This is very important, especially for inputs.

- Training by doing. Farmers learn better when you do together with them. Demonstration farms are,

therefore, important tools for the VBA to show farmers best practices or to test, for example, various seed varieties, before referring farmers to use the same.

- Use of technology to provide a platform where VBAs can share. This could be in form of WhatsApp. VBAs encourage each other by sharing what each is doing. Through such platforms, they also train each other and this enables faster dissemination of knowledge and skills.

- Anchoring the model within the existing county extension structure for sustainability. VBAs should not work in isolation. They should work closely with the county technical staff based within their area. For buy-in, the county should be involved right from the inception and in all activities. The VBAs should, therefore, be answerable to the county extension staff for better coordination.

- Business training that encompasses training on record-keeping and business mentorship/coaching is important for the VBAs. This will sprout the entrepreneurial seed within the VBAs and, therefore, sustainability of the model.

Using ICT to enhance village-based extension for smallholder farmers in Embu County

"Thanks to the Regenerative Agriculture Project, I now have access to agricultural, market and weather information," says Perpetuah Munyi, a mother of two who works as a Village Based Advisor (VBA) in Kithegi village, Kithimu ward of Embu county. Perpetuah is one of the 134 VBAs trained by the Regenerative Agriculture Project, which was implemented by Farm Africa in Embu county. As a VBA she continues to offer advisory services to farmers on agronomy as well as input and output markets.

She began by passing the knowledge to the 100 farmers in her village through weekly training sessions on her demonstration plot. She also had to visit the farmers in their farms to check on their progress on adopting the practices.

"Moving from one farmer to the other was time consuming and expensive. I ended up spending money from my pocket for transport," she observes. Her woes, however, came to an end when AGRA introduced her to a mobile phone-enabled service (AgriBot), to support the dissemination of weather information to the 10,000 farmers in Embu county.

Why ICT in extension?

Embu county, like all other counties in Kenya, experiences widening gap between extension officers to farmer ratio (1:3500, 2019 census report). This has limited farmers' access to extension information. On average, Perpetuah and her fellow VBAs are in charge of 100 farmers each. Even though they are volunteers, they incur transport costs and spend time moving from one farmer to the other just to deliver information. While mobilizing farmers to attend meetings and training sessions, or just to relay information through phone calls and short messages (SMS), the VBAs incur airtime costs. This made it difficult for the VBAs to achieve a satisfactory number of farmers during such meetings and training sessions. This, therefore, limited the number of farmers getting extension information services. The emergence of COVID-19 pandemic further complicated the situation; limiting the number of people participating in group activities and person-to-person interactions.

The interventions

To address these challenges, AGRA partnered with Microsoft to support Farm Africa in introducing digital RA extension services to County Government of Embu, VBAs, stakeholders and Farmers. The technology, AgriBot, which is a digital chat platform, enables communication through short messages (SMS), WhatsApp and Telegram. The use of the technology was aimed at strengthening collaborative learning and dissemination processes of key Regenerative Agriculture technologies and practices to farmers, County Government and other stakeholders.

AgriBot

AGRA AgriBot is an agricultural chatbot that supports AGRA's VBA program.

AGRA AgriBot facilitates VBAs and farmers to access information and services, via SMS (40139), WhatsApp (+254 758 318589) and Telegram (@AgraAgriBot).

The Chabot features include:

1. Maize
2. Climbing beans
3. Pigeon peas
4. Bush beans
5. Soybeans
6. Agroforestry
7. Manure
8. Fall armyworm
9. Fall armyworm feedback
10. Weather forecast
11. Reporting locusts
12. Agro-dealers
13. My Farmer's Information
14. Update profile
15. Seed variety feedback
16. General Feedback

Training and on-boarding: Microsoft trained and on-boarded 134 VBAs, 45 Embu county agricultural extension staff and 15 stakeholders on AgriBot. The Extension officers also provided lists of certified agro-dealers to be on-boarded on the platform, directly linking them to VBAs to ease access to certified inputs. The VBAs registered the farmers they serve into the system, creating a direct link among them.

Registration and on-boarding of farmers and agro-dealers: The VBAs on-boarded 9,258 farmers that were recruited in the RA project into the platform. Five (5) major input distributors in Embu county were also on-boarded and linked to VBAs to bridge the gap on the unavailability of certified inputs. The input distributors include Munya Suppliers, Mazao na Afya Limited, among others.

Training of farmers: VBAs have actively been training and on-boarding farmers on the AgriBot platform enabling them to access e-extension information and services on RA practices and technologies in maize and pulses value chains remotely, with ease.

Results

Access to E-extension services: Through AgriBot platform, 9,258 farmers accessed RA information on maize and pulses value chains and other e-extension services from 134 VBAs.
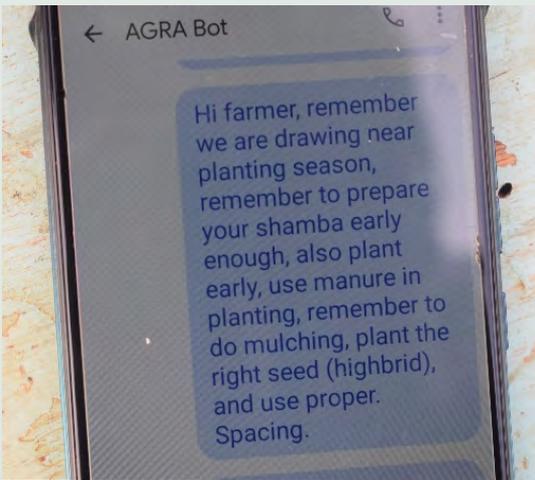
A message sent to farmers through Agribot.

Ruth Murage reaches more with less

Ruth Murage, 42, is one of the 134 VBAs taking part in the Regenerative Agriculture Project in Embu county. Her role is critical since other farmers in her Muthiru Village, Embu County, look up to her for guidance on RA Practices. In the beginning, she would cover long distances on foot to visit the farmers and was forced to use a motorbike, incurring transport cost.

"This AgriBot, which was introduced to us by Farm Africa has made my extension work easier. I am able to reach many farmers at a go by sending bulk messages for free," says Ruth who has so far registered 100 farmers on the platform. She adds that the digital extension service saves time and money, and is user friendly.

Before, the number of farmers who showed up for training sessions was very low compared to the current rate of 85%.

She is encouraging her farmers to make good use of AgriBot so that they can access valuable information on good agricultural practices for maize and legumes production. Currently, 3 of her farmers use the platform regularly but she is conducting more training among farmers to increase uptake.

"The information on AgriBot helps me in my extension work. Before I train the farmers, I make sure that I read through the RA practices so that I can share the correct information with the farmers," she adds.

Increased input demand: The Project used mother demonstration plots manged by VBAs to reach out and train farmers on RA. This attracted farmers who expressed interest in similar inputs and practices to apply on their farms creating a demand for inputs. A total of 11 VBAs, who had already been linked with the input suppliers through the Agribot, aggregated the demand and ordered supplies from the dealers, with the bot becoming a direct linkage between the farmer and the input suppliers. Through the platform, the farmers were able to purchase 3000kgs of certified maize seeds, with the VBAs earning a cumulative commission of Ksh 49,200 (about US$447).

Recommendations

The AgriBot chat bot has proven to be a very strong tool in enhancing extension service delivery to farmers. However, a few lessons emerged.

- The digital service providers should develop the system to have a target farmer option and register of the farmers.

- The service providers to incorporate more value chains such as livestock and horticulture.

Using digital tools to propagate regenerative agriculture practices in Makueni county of Kenya

The use of information, communication and technology (ICT) in agriculture has quickly gained popularity among development agencies, the private sector and even the government in developing countries. ICT for agriculture (ICT4Ag) services such as trade platforms, notification platforms and advisory/extension services have been developed, and have become very useful tools among smallholder farmers given the dwindling numbers of government extension staff in the counties.

Deploying the e-extension platforms

In the case of Makueni county, the extension gap grew to a ratio of one extension officer serving 1,099 farmers (1:1099), way above FAO's recommended rate of 1: 400 (FAO).

In an attempt to address this problem, Cereal Growers Association (CGA), through the Regenerative Agriculture project, came up with an idea of how to reach more farmers and avail extension services to smallholder farmers in the county through the use of ICT platforms. The idea was to facilitate the Village Based Advisors (VBAs) to deliver extension services more efficiently and at minimal cost. This included the use of SMS, mobile applications, and social media (Whatsapp) to interact with farmers.

Creating farmer Whatsapp groups by VBAs: Each VBA was encouraged to create a Whatsapp group for the farmers they were serving under the project. Out of this initiative, 37 VBAs created Whatsapp groups for their farmers. On average, every Whatsapp group has 15 farmers, totaling 555 farmers. The groups were used to share agronomic information to farmers as well as to notify them about programs and events that would be of benefit to them.

Creating Whatsapp groups for VBAs and value chain actors: With the aim of building the sustainability of VBAs through building business cases around them, the project created digital platforms which brought together VBAs and the input and service providers so that they could share information and experiences. Two Whatsapp groups were created for this purpose. Members in these two Whatsapp groups shared information about new products, new technologies, demand aggregation for inputs and services, market information, adverts for products, photos for farm level adoption of technologies, availability and linkage to product and services, and notification for meetings and programs.

Introduction of Kilimo mobile application to VBAs: In order to digitize the VBA operations, the project developed and introduced the Kilimo Mobile application, which was used to collect data digitally from farmers, VBAs and distributors. It also enabled the VBAs to capture data for the services they offered to farmers and track their progress to enable them make sound decisions when it comes to services to be offered to farmers . Additionally, the App would enable the project partners to access real time reports of the VBAs from the Cloud. The system also enabled the VBAs and suppliers to interact in real time in order-making and servicing. A total 42 VBAs (25 of them women), out of the target 55, interacted with the mobile application, reflecting 76% success rate. Kibwezi West and Makueni sub-Counties each had 19 VBAs (45% achievement per sub-county) interacting with the App. The input and service providers developed digital adverts in native languages to make it easy for the farmers to digest.

AIS Kilimo is an entrepreneurship mobile-based digital application technology. The App is designed to support VBAs with a platform where they are able to: (i) register their farmers, and (ii) digitally record their business transactions; recording both farmer orders and purchase orders from distributors/stockist. From the App, the VBAs have visibility of their customer (farmers) database, can monitor their daily sales and revenues, assess their costs and track their business expenses. In addition, the VBAs are able to manage their stocks and inventory ensuring they have sufficient stocks to cater for their farmer inputs demands. The key attribute of the mobile App is in its ability to provide simple daily financial reports that inform significant business decisions. Moreover, the VBAs can generate and share credible information to financial providers to access required credit for their business operations.

An on-boarding App target of 50% of the VBAs (55 VBAs out of 110 VBAs) was set. The target was set in consideration of the short project duration (3 months) of learning and adoption by the VBAs.

Results of the intervention

The deployment of and access to the e-extension platforms by the VBAs and farmers in Makueni county has led to the following results:

- Up to 37 VBA/farmer Whatsapp groups are currently actively sharing digital agronomic information on regenerative agriculture practices in Makueni county. Out of these, 555 farmers are directly receiving digital agronomic information through the Whatsapp groups, while 37 VBAs are benefiting directly, through improved earnings, from serving their farmers with e-extension services through the Whatsapp groups.

- Value chain actors have directly benefited, through improved sales, from the platforms where they share information and digital adverts about their products and services.

- The Whatsapp groups also provided the project team with a platform for efficient coordination and mobilization of farmers. One notification sent in a Whatsapp group can reach hundreds of recipients in real time. By posting the evidence of a photo, one can tell what is happening where, when and how.

- Through sharing of real time achievements, the VBAs were able to challenge each other and duplicate the achievements for their growth and sustainability of livelihoods.

Lessons learnt

- Low literacy levels can be a hindrance for use and adoption of digital technology in extension service delivery.

Illustration on rate of access to digital information in relation to age bracket.

Rate of
access to
E-extension

40 years
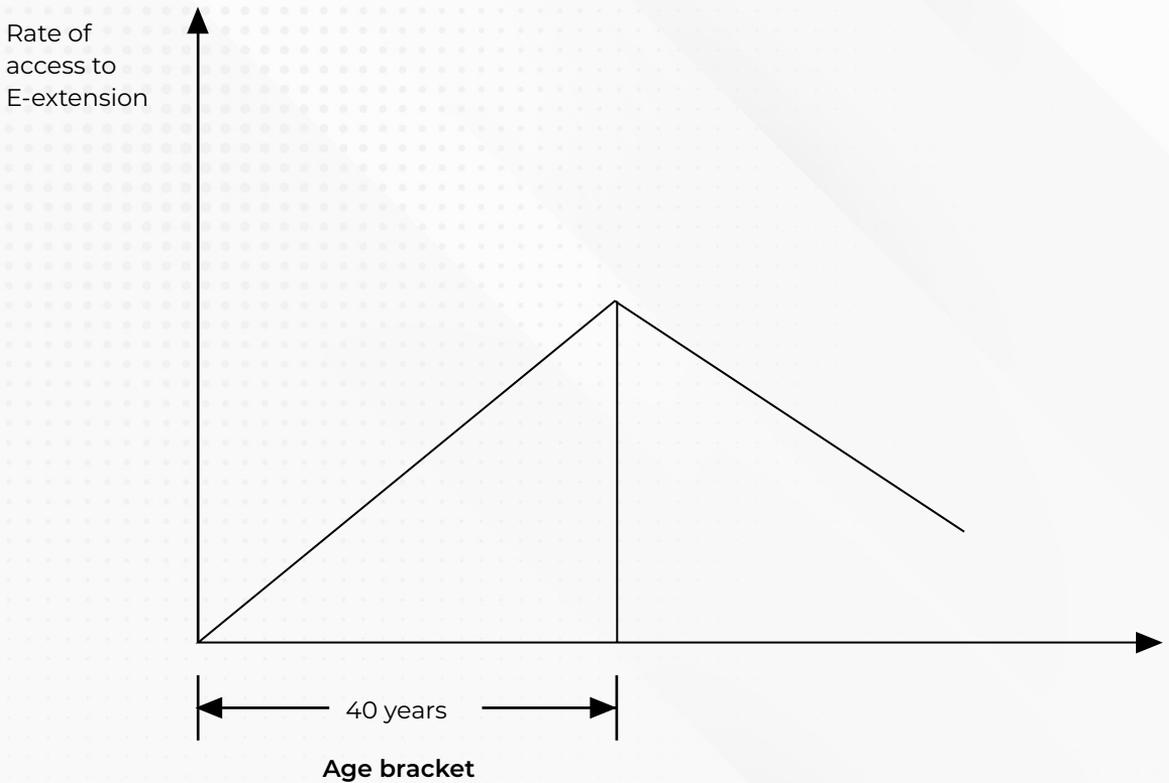
Age bracket

The above diagram illustrates the rate of access to e-extension in relation to age bracket. In the diagram, farmers aged below 40 years are accessing more digital content than the older ones. This means literacy level has a direct relation to how easily one will be able to access digital information. The campaign should be geared towards getting more young people to embrace agribusiness. This system, being at development stage, gives hope for a fully digitized VBA operations.

- Digital tools have a high potential in making extension an easier job. With the world's increasing number of people accessing the internet, e-extension is an opportunity that can no longer be ignored.

- The use of digital tools leverages partners' coordination for efficiency. From the digital platforms, partners were able to share areas of collaboration, while sourcing of relevant manpower was made easier by referrals from the relevant digital groups.

- Target advertisements in native language have become popular with the Whatsapp groups since farmers consume them readily.

- Access to digital tools is popular with the youthful farmers but very unpopular with the older farmers. This poses a challenge on e-extension since the bigger population of farmers comprise of the elderly. 'The elderly are challenged on navigating through the digital gadgets and tools and therefore they are inactive in social media," says Caroline Ndoni, a VBA in Makueni.

Recommendations.

- As more farmers gradually get to access digital content, there is need to incorporate content creators as part of core actors in agriculture. This will help in targeting audiences with content that informs the direction of the world in matters agriculture i.e content on regenerative agriculture, sustainable agriculture and agro-ecology, among others.

- Due to low levels of literacy among smallholder farmers, content need to be packaged and delivered in a way that it is easy to transfer and consume. Low levels of literacy among farmers makes a strong case for the use of native languages to reach marginalized groups while using such technology.

- Diversification of the form of content is important in order to reach many regardless of the gadgets they own. For example, a text message can reach many farmers compared to a video which may reach only those with smart phones.

Citation

1. *International journal of innovative studies in sciences and engineering technology.* Available at: (PDF) International Journal of Innovative Research in Science, Engineering and Technology (researchgate.net)

Taking up Regenerative Agriculture practices for food security and community resilience: The case of Makueni County

Just like many other farmers in her village in Muani, Kaiti sub-County of Makueni County, Mercy Musyoki, 38, has been using oxen drawn plough to till her farm. Every season she got low yields. But she continued tilling the same farm the same way and planting the same crop. This continued until July 2020 when she, alongside her fellow Matithini Self Help group members, was trained on regenerative agriculture practices and technologies. Soon after, she started realizing improved yields. This was after she applied the practices in her 2-acre farm. She has also planted pumpkins in her farm as a cover crop. This helped in curbing the outgrowth of weeds, hence saving her costs relating to weed control. "I have been able to cut down on expenses when it comes to weeding through the use of cover crops in my farm," she says.

Farmer challenges

Farmers in Makueni County have been facing several agricultural challenges in the maize and pulses value chains. These include:

Climate change: Climatic crisis has fundamentally altered the water cycle around the world and Makueni County of Kenya is no exception. The result is shifting precipitation patterns and increased evaporation that causes frequent rainfall and more severe droughts. This has resulted in low agricultural productivity and weak economic resilience among farmers in the county.

Biodiversity crisis: This arises out of use of mono-culture along with strong dependence on external inputs. Genetically, uniform crops can be susceptible to rapid spread of pest and diseases. The increase in human population and clearance of native habitats has a major impact on the land.

In Makueni, farmers widely practiced mono-cropping. Additionally, the county experiences high incidences of soil erosion due to poor soil conservation practices as a result of desertification and deforestation.

Limited access to agricultural extension services: For the past years, the county government of Makueni has deployed very limited personnel to help carry out agricultural extension services. For instance, the current ratio of extension officer to farmer stands at 1:1099 compared to the optimum extension service ratio of 1: 400 (FAO). Although agriculture remains the main economic activity in the county, access to agricultural services remain very low in a county with estimated 193,531 farming households against 176 extension officers. This situation has hindered many small holder farmers from catching up with the changing technological trends in agriculture and modern farming practices.

Land degradation: In Makueni, it is a common practice for smallholder farmers to use conventional ways of farming. This include oxen-drawn ploughing, mono-cropping, and tilling of the same piece of land and planting it with the same crop over a long period of time without enriching the soil. This has resulted in land degradation, which has manifested itself in the county through low yields, soil erosion, and reduced water infiltration. Ploughing also exposes the soils to wind and water erosion.

The interventions

In response to these challenges, the Cereal Growers Association (CGA), through the Regenerative Agriculture (RA) project, worked with the farmers, the County Government of Makueni and private sector companies to build

community resilience. In Makueni county, the project targeted 10,000 farmers directly and another 50,000 indirectly in three sub-counties- Kaiti, Makueni and Kibwezi West.

The project also supported strengthening of community level extension services, through the village based advisors, as a driver to the promotion of regenerative agriculture practices and technologies. This was besides an adaptive learning component which promoted elaborate learning to generate and disseminate evidence on the institutional arrangements, farmer services, and financial solutions required to develop a successful small holder farming system. Among the farmers, the project focused on the development of pulse value chains, which include maize, sorghum, green grams, pigeon peas and cow peas.

Regenerative Agriculture is an approach to farming that focuses on **restoring** degraded soils to promote healthier ecosystems and plant growth by rebuilding soil organic matter through holistic farming and grazing techniques that try to mimic what would happen in nature. Regenerative agriculture is a mix of farming techniques/practices that have been tested to improve yields, create drought-resistant soil, revitalize local economies, preserve traditional knowledge, nurture biodiversity, improve nutrition, restore grasslands and ensure less disturbance of soil which is important in carbon sinking.

RA Practices

1. **Mulching** which is the use of plant or crop residues to cover the soil. This can be used as a source of weed control, and improve moisture conservation in the Soil. Mulching controls soil erosion and leads to healthy crop growth.

2. **Cover cropping** whereby crops are grown over the soil to protect the soil and as a soil amendment.

3. **Inter-cropping** which is the practice of growing two or more crops to produce a greater yield on a given piece of land and this helps in stability and diversity of fields as well as increase in yields due to higher growth rate , reduction of weeds ,pest and diseases.

4. **Minimum tillage** which involves of no till hence reduces soil erosion and encourages water to infiltrate soils

5. **Agro –forestry** which involves integration of trees with crops to help conserve and protect natural resources by controlling soil erosion hence attaining substantial improvement of the economic sustainability.

6. **Use of organic manure** to supply the soil with nutrients hence benefiting the plant growth rate.

7. **Soil and water conservation structure** such as use of terraces and basins.

8. **Crop rotation** which involves planting of different types of crops in the same piece of land in different seasons.

The Approaches

Training on VBA model: To start off the process, AGRA trained CGA and the County government agricultural extension staff on the VBA model and the VBA selection criteria.

Aggregating farmer needs: After the training, CGA, through the County Government, conducted a needs assessment with the aim of aggregating the farmer needs. The assessment focused on farmer needs in regard to production, market needs, access to inputs, financial needs and knowledge gaps.

Recruitment of VBAs: With the help of the County government extension staff, CGA then recruited 114 VBAs from a list of lead farmers from the three sub-counties. The list had been provided by the County government staff after community consultation. The VBAs were then sensitised about the project and its objectives, besides being linked with value chain actors including input suppliers and aggregators among others.

Training on RA: The project then trained County extension workers on RA practices and technologies. The county extension workers then, in turn, trained the 114 VBAs.

Profiling of farmers: The VBAs went back to their various locations where they profiled farmers who would be engaged in the project. Each VBA was tasked to profile at least 100 farmers.

Training of farmers: The VBAs then trained the profiled farmers on the RA practices and technologies. They also informed them of the existence of various service providers. During the farmer training sessions the VBAs would then aggregate the demands for products and services that the farmers had.

Ward meetings: At the ward level in the respective three sub-counties, CGA organised advocacy meetings which were meant to reach and sensitize those farmers who had not had a chance to interact with the VBAs.

Results

Adoption of RA practices: In Makueni County, the project trained 14,917 farmers (67 percent of whom are women and 31 percent youth) on the RA technologies and practices in Kaiti, Makueni and Kibwezi West sub-counties of Makueni. The trained farmers have taken up the practices.

FARMERS			
Sub-county	**Male**	**Female**	**Total**
Makueni	1706	5710	7416
Kaiti	703	1601	2304
Kibwezi west	1591	3606	5197
Total	**4000**	**10917**	**14917**

Table 1. Illustrating the number of farmers trained on regenerative agriculture

Farmers in the county have adopted the regenerative agriculture practices as well

Number of farmers up-taking RA practices in Makueni County					
	Total	Male	Female	Age (18-34 years (youth)	Age-+35 years
Minimum tillage	4412	1183	3229	900	3512
Inter-cropping	4580	1162	3418	760	3820
Cover cropping	3127	931	2196	646	2481
Mulching	2561	776	1785	489	2072
Use of organic manure	4826	1322	3504	849	3977
Soil and water conservation	4409	1002	3407	729	3680
Agroforestry	2648	744	1904	451	2197

Table 2. Illustrating the number of farmers up-taking the different Regenerative Agriculture practices.

Reduced cost of production: Farmers in the County have witnessed a relative increase (12%) in the adoption rate of RA practices. Some of the popular practices are minimum tillage, inter-cropping, cover cropping, soil and water conservation structures, and use of organic manure. Farmers testified that application of RA practices has regenerated the fertility of the soil, and to their surprise, the cost of production has also gone down even with increased production.

Enhanced access to extension services: Through the project intervention, farmers are now able to acquire extension-based services through the village based advisors. Cereal Growers Association, with the help of the Ministry of Agriculture, recruited the 114 VBAs who offer direct services to farmers. As a result, majority of farmers in the county have enhanced access to agricultural extension services.

Livelihood transformation: The project has transformed the livelihood of many VBAs in Makueni. Most of the VBAs, before the project, would struggle to make ends meet, including providing for their basic needs and those of their respective families. However, following the project's interventions, the VBAs have turned into village entrepreneurs earning sufficient income to cater for their livelihood. The VBAs offered services to farmers worth Ksh 28,680,832 (about US$260,735) of service, earning Ksh 4,586,110 (about US$41,692) in commission. The lead farmers have also enhanced their income through improved yields and reduced production costs.

The training, in October 2020 for Mercy and her Self-Help group members, by a VBA through the RA project, implemented by CGA and supported by AGRA, focused on RA practices which include mulching, use of organic manure, cover cropping, mulching and minimum tillage.

In Makueni County, the project trained 14,917 farmers (67 percent of whom are women and 31 percent youth) on the RA technologies and practices.

After the training, Mercy established two baby demo plots, each measuring 10 meters by 10 metres, on which she applied a number of RA practices such as use of organic manure, minimum tillage, mulching and inter-cropping.

Besides the baby demo plot, she inter-cropped maize and beans and used organic manure on the 2-acre farm. As a result of these interventions, despite depressed rains experienced in the last season, Mercy's maize yields from the farm increased, from 6 - 90kg bags on average to 15 - 90kgs bags. "I am surprised that I am spending less on production...while the yield is going up," she says. She wishes that more farmers in the county would adopt the use of the RA practices in order to minimize production costs and maximize yields from their farms.

Raphael Kyalo, a farmer, in his farm where he has done the uptake of different Regenerative Agriculture practices.

What made it work?

The Mother - Baby demo concept suited different needs of farmers at different levels. This included farm input needs, knowledge and skills, and training venues which were highly accessible to the farmers. The demos allowed the farmers to practice what they have learnt from the comfort of their farms.

The VBA adopted a sustainable model of transferring knowledge and technology from experts (county government, CGA and actors) to farmers. Training the farmers on the RA practices ad technologies and linking the VBAs with suppliers and market off-takers aggregated the demand and supply chain.

Support by the actors (the project, farmers, VBAs, the government, input suppliers, market-off takers, mechanization providers and service providers) guaranteed a value proposition for all the stakeholders involved.

Cordial collaboration with the county government made it possible for the seamless flow of activities and desired results. The staff at the Agricultural Department of the County Government facilitated the quick identification of the lead farmers who were then trained as the VBAs. At the grassroots, the county staff introduced the VBAs as their support staff in the respective villages, thus facilitating community entrance.

Additionally, the integration of the VBA model within the county government's extension service system, by introducing a similar program of community extension volunteers (CEV), is a sustainability measure that will mitigating the shortage of agricultural extension services in the county. The county government has identified and trained 240 community extensions volunteers for this purpose.

Taking up Regenerative Agriculture practices for food security and community resilience: The case of Embu County

A group of farmers from Mbeere Mwangaza Cereals Cooperative are on a hot Friday afternoon, in the month of October, sitting below tree shrubs at the Makima Chief's camp discussing their bumper harvest with great excitement. Mrs. Margret Muunde, their chairperson, is addressing them on the benefits of regenerative agriculture practices and technologies that are being emphasized in the county through the Regenerative Agriculture (RA) project. The RA project is being implemented in the county by Farm Africa, through the support of AGRA. The discussion revolves around the bumper maize and pulses harvest, which they got after applying some of the regenerative agriculture practices and technologies.

The farmer problems

The Mbeere Mwangaza Cereals Cooperative group members were excited about the harvest because for a long time their farms have been recording very low yields due to many challenges. Embu County has two different agro-climatic zones that range from cold and wet upper zone to hot and dry lower zone. Despite the wide range of variance in the climatic conditions, the county relies heavily on the agricultural sector with 70% of the population deriving its livelihood from agricultural production. The county has high agricultural potential but the smallholder farmers have been facing a threat in agricultural productivity. This has accrued due to several constraints, and these include:

Declining soil fertility: Many smallholder farmers have been practicing continuous cultivation of their land without soil fertility improvers. This is because they lacked the knowledge on how to improve soil fertility. Others believed maize and pulses did not need any soil fertility improvement. In addition, the farmers did not have skills on the right application of fertilizers and manure.

Climate change: As it has been with many other parts of the world, Embu County has been experiencing dramatic changes in the weather patterns which have had a great impact on farmers. For instance, during the March - May 2021 long rains, most parts of the county experienced diminished rainfall, which led to low yields and, in some instances, total crop failure.

Inadequate extension support: Due to the low number of extension officers in the county with a ratio of 1:3000 (Ministry of Agriculture, Livestock and Fisheries), many farmers hardly receive any extension support, especially on field crop and this has significantly impacted on the yields.

Poor farming methods: Farmers in the county applied poor farming practices such as use of conventional seed, poor spacing and seed rate, inappropriate agro-forestry systems, increased use of inorganic fertilizers, seasonal ploughing of land, ploughing across the contours and burning crop residues, all which have had negative impact on agricultural productivity.

Tackling the problems

The members of the Mbeere Mwangaza Cereals Cooperative form part of the 10,000 farmers that Farm Africa had targeted to work with in the 16 months RA project, to intensify production in maize and pulses value chains. Through its interventions, the project focused on combining the local knowledge with advanced farming technologies to increase yields and improve incomes and livelihoods of small holder farmers in the county.

Farmer training: As an entry point, the project identified 100 private village

based advisors (VBAs) who were trained together with Ward Agricultural Officers (WAOs). The 100 VBAs were identified from a list of lead farmers by the County Government's department of agriculture. After the training, the VBAs and WAOs in turn trained the 10,000 farmers. The training focused on good agricultural practices including correct spacing, use of certified seed and crop protection. Additionally, the project created awareness among farmers about the RA practices and about VBAs and their role.

Setting up demo plots: To spur uptake of the RA practices and technologies by farmers, Farm Africa assisted the VBAs to establish mother-demo plots on which the RA practices were showcased. They then invited the farmers to the demo plots for skills training and field days. This enhanced transfer and adoption of the technologies and skills to the individual farmers. Each VBA was tasked to train 100 farmers from their villages. The farmers, in turn, went back to their individual farms where they established baby-demo plots to showcase how much they had learnt from the mother-demos. The baby-demos also encouraged peer learning among farmers as fellow farmers visited the plots to learn from one another. The demo plots were set up in pairs; one with the RA practices and another one without, to act as a control plot.

Farm visits: To ensure consistency and uniformity in the application and adoption of the RA technologies by farmers, Farm Africa agronomists conducted regular farm visits to the targeted farms throughout the entire period of the project.

Awareness meetings: Farm Africa facilitated meetings with farmers, VBAs, Ministry of Agriculture staff, and private sector companies offering inputs and marketing services to enrich the VBAs with awareness of the RA practices and techniques as well as to promote public-private sectors partnership in the maize and pulses value chains in the county.

1. **Minimum soil disturbance:** This involves low tilling or no tilling of land to reduce disruption of the soil ecosystem. The main aim of this practice is to increase soil quality by reducing soil erosion and compaction while improving water availability and retention. In addition, it assists save on the cost of ploughing the land.

2. **Cover-cropping:** This involves planting crops that cover the soil surface. This helps the farmer in soil moisture conservation and suppressing weeds. In return, crops become climate resilient and also prevent soil erosion.

3. **Inter-cropping**- This is the cultivation of two or more crops simultaneously in the same field with an aim of maximizing use of resources on the same piece of land. Farmers also get to improve on the yield.

4. **Crop rotation:** This is intentional planting of different types of crops on the same field in different seasons. This helps to improve on yield by 10-25% (Farm Africa, 2021).

5. **Mulching:** This is spreading plant materials such as straw, fresh cut forage and tree leaves on the soil surface. As the plant material decomposes, it improves the soil fertility. Also, mulching helps to regulate the plant temperatures keeping the soil moist during very hot climatic conditions. In addition, it conserves the soil moisture.

6. **Organic manure:** This is using animal and plant residues containing plant nutrients to improve the soil structure and supply the soil with plant nutrients.

7. **Agro-forestry:** This is incorporating trees, shrubs and other woody perennials in the agricultural land with the aim of improving soil fertility and supporting biodiversity and increasing yields.

8. **Bio-phosphates and mycorrhizae:** This is using fungus to create a symbiotic relationship between the plant and the fungus, which helps the plant to uptake minerals and water from the soil.

BOX 1: Regenerative Agriculture practices incorporated in the project

Demo protocols

Demo; showing RA practices	Control; showing Non RA practices
• Farmyard manure	• No farmyard manure
• Agroforestry trees	• No Agroforestry trees
• Bio phosphates	• No Bio phosphates
• Minimum tillage	• No minimum tillage
• Intercropping	• Intercropping
• ½ rate application of inorganic manure	• ½ rate application of inorganic fertilizer
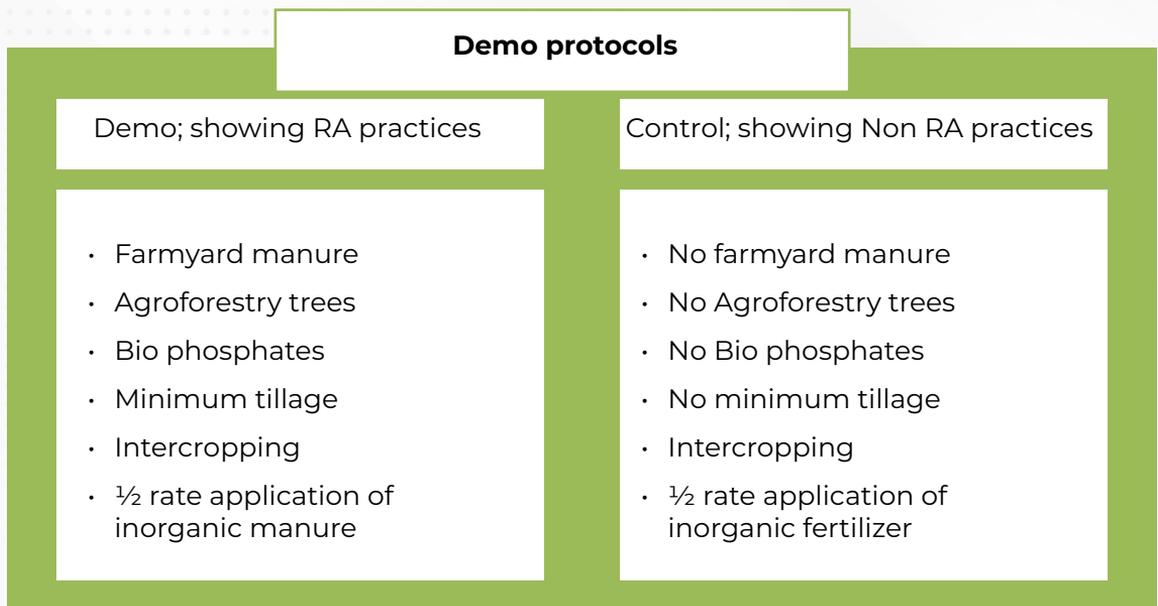
Figure 1: Demo protocol layout

The outcomes

Farmers were motivated to scale up the interventions in the second season (March-May 2021) of the project. As a result of the interventions:

Expanded reach: The project reached beneficiaries spread out in 15 wards in the 4 sub counties of Embu. A total of 134 VBAs (49 Males, 85Females; 16 being Youths) were recruited and 134 mother-demo plots established in the first season (October - November 2020 short rains). A total 10,239 (3,479 Males, 6,760 Females; with 1068 being Youths) farmers were trained on RA through various farmer groups in the area. In addition, 45 Ward Agricultural officers (WAOs) and Field Extension officers (FEOs) have been trained on RA.

Employment opportunities created: The project created employment opportunities, especially for the youth and women who adopted the RA practices and can now earn income from their small scale farms. Zipporah Wahu a 37 year old farmer in Nembure village was able to earn Ksh.14,000 from selling green maize, before harvesting 3 (90kg) bags for her own consumption, from a 2-acre piece of land where she applied RA practices. Before the project, she used to get only 3 (90kg) bags from the same farm. Zipporah is now intending to roll out RA practices on all her 3 ½ acres. VBAs within the project have identified various income streams like linking farmers to inputs from where they earn commission.

Enhanced access to extension services: Through the project, farmers in Embu County can now access extension services more easily from their VBAs, and the ratio of extension service provider has been reduced from 1:3000 to about 1:110.

Strengthened public-private partnership: Through the strong collaboration promoted by the project of the County Ministry of Agriculture, Farm Africa and private sector companies in the project, an enhanced partnership has been created for the benefit of the smallholder farmers.

% ADOPTION OF RA
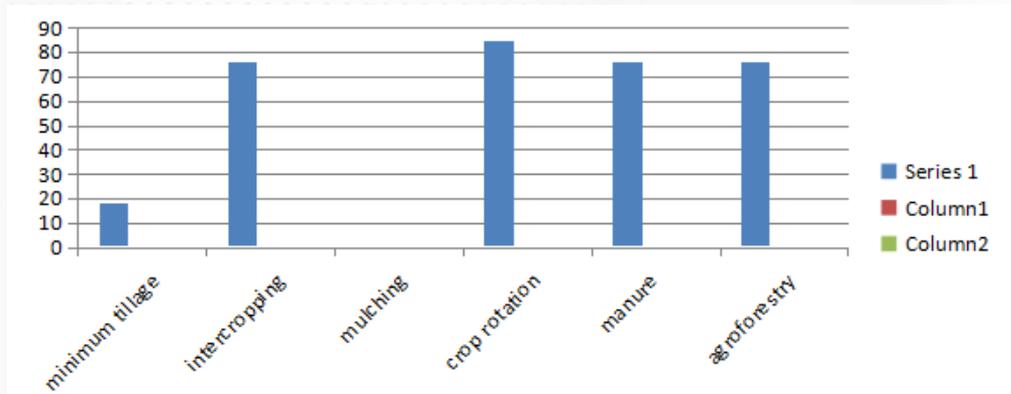
Figure 2: Adoption of RA practices by 10,239 farmers in Embu

Reduced cost of production: Farmers have been able to reduce their cost of production, and have, instead, increased yields and improved soil fertility.

Reuben's increased yields, at reduced costs.

For many years, Reuben Ngari, a 65 year old farmer in Kavangua Kithunguthia village, Kagaari South ward in Embu County has been experiencing reduction in yield season in season out. This is because of declining soil fertility due to continuous use without replenishment of the soils. Also, the conventional seed, 'kiembu' variety, has become less productive with time.

In November 2020, Reuben got a new experience where he was trained on Regenerative Agriculture (RA) practices from his Village Based Advisor (VBA) through an AGRA funded project that is being implemented by Farm Africa. He was trained on how to regenerate the soil using RA practices like minimum tillage, use of organic manure and fertilizers, mulching, agro-forestry, inter-cropping, crop rotation and cover cropping. Reuben has also been trained on good agricultural practices like variety selection and use of certified seed, control of pests especially the fall army worm and also correct spacing for maize and beans.

Reuben has applied the knowledge he gained from the project for the current season and he is practicing a number of RA practices like mulching, minimum tillage, inter-cropping and application of organic manure and fertilizer.

Reuben harvested 4 (90kg)bags of maize and 2 (90kg)bags of beans from his acre compared to the 2 (90kg)bags of maize and 40kgs of beans he has been getting from previous seasons. This is a good harvest since the season received very little rains. Using RA has also lowered his cost of production from Ksh8,400 to 3,200 (about US$76 - US$29), 61 per cent decrease, as he did not have to use a tractor to plough his farm and also he only did one weeding.

Reuben is currently planning to integrate more RA practices on his farm to increase on his yields in the coming seasons.

Farmer Name	Land size (acre)	Before project Intervention				After Project Intervention			
		Maize(bags)	Beans (debe/2kg tin)	Green grams (bags)	Soy bean (kgs)	Maize (bags)	Beans (debe/2kg tin)	**Green grams (bags)**	**Soy bean (kgs)**
Catherine Njeru	1.5	10	1	*	*	32	4.5	*	*
Ruth Mutua	4	3	*	1	*	5	*	2	-
Paul Kinyua	1	4.5	0	*	*	15	4.5	*	*

Figure 3: Table showing maize/bean yield before RA and after

Challenges

- **Erratic nature of rainfall:** During the March-May season, rains were poorly distributed. Rains disappeared during the critical crop growth stages resulting in poor yields. Some areas in Mbeere received rainfall for 18 days averaging 13mm during the whole cropping cycle.

- **Covid 19 pandemic:** This reduced the number of participants that could be trained on an occasion, due to existing Ministry of Health protocols.

- **Conversion of land:** In Embu county there is high rate of agricultural land being converted into residential plots and Khat farming. This has reduced the farm size thus reduced food production.

- **Fluid nature of youth:** The number of youth engaging in the project activities was small since the majority are migrating to seek employment in urban areas.

- **Rigid distribution channels:** Many of the well-established agro-input companies have strict distribution channels for their products to follow. Therefore, the VBAs can only access their product at designated agro-dealer shops, hence reducing on the margins they (VBAs) earn in commissions.

- Low number of male VBAs and farmers engaging in project activities, yet they are the key household decision-makers on matters concerning land usage.

Lessons learned

- **Integration of crop and animal farming;** it was observed during the project that VBAs and farmers who practice mixed farming have better farms. This is because they have manure that they can easily apply on the farms to improve soil structure and nutrient availability.

- VBA business model requires incentives and it would be great

to incorporate views of other stakeholders in proper value chain selection. This would create opportunities for VBAs on diversification since maize and beans are seasonal crops.

- **Diversification of Value chains;** some value chains, especially green grams and soybeans are emerging as key income earners for both VBAs and farmers in Lower Zones and require to be incorporated in the RA project.

- **Legal registration and accreditation of VBAs**; the VBA model has come out as appealing to many stakeholders in the agricultural sector. For the model to be sustainable, there is need to legalize it by developing a code of conduct that can bond VBAs and stakeholders during their engagement.

- **Need for soil testing sensitization;** many farmers do not understand why they need to carry out soil testing in their farms. This makes it hard for them to understand the situation of soil health on their farms, hence declining food production.

Recommendations

- **Certification of VBAs:** VBAs offering specialized services such as immunization of chicks and sale of agro-chemicals require certificate of practice, hence limiting them on service delivery to farmers.

A farmer in Embu county showing off her bumper harvest despite rains shortage.

SUCCESS STORIES FROM MAKUENI

Counting the gains: Makueni's Fridah Muendo reaps benefits of regenerative agriculture

Fridah Muendo shows off her improved harvests and food security thanks to the Regenerative Agriculture project.

The village of Kinyongo in Kaiti Constituency of Makueni County was once known for its maize production. Not anymore. Today, it struggles with the impact of rainfall variability due to climate change and land degradation. Farmers also lack access to supportive extension services and weak link to input supplies and markets.

CGA, with support from AGRA through the Regenerative Agriculture (RA) project, recruited Fridah Muendo, 33, and trained her together with 114 others in Makueni County as Village Based Advisors (VBA). The project worked through VBA model to strengthen community-based public-private extension system in the county in order to promote adoption of regenerative agriculture (RA) practices

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> **"I am currently aggregating beans not only from the 73 farmers but all farmers from the surrounding villages," she says.**

and technologies among smallholder farmers.

After the training, Fridah established the Kinyongo Farmers Self Help Group and trained 73 of its members on RA practices through mother and baby demos. On her farm, she has inter-cropped pigeon peas, maize, and cowpeas. She has also established a tree nursery to help with soil conservation and built terraces to conserve water.

From only 3 (90kg)bags of maize per acre, her production has doubled to 6 (90kg)bags per acre. In addition, Fridah developed business skills and has been linked to grain value chain actors. She set up a cereal store where she off-takes grains from farmers. She also sells post-harvest handling equipment such as hermetic bags, hand shellers and tarpaulins. That has increased her monthly net income from Ksh. 10,000 (about US$99) to Ksh. 30,000 (about US$272). Her living standards and that of her family has improved.

Joseph Mulu, a beneficiary of Fridah's training, displays maize harvest from his baby demo farm, grown with the guidance from Village Based Advisor supported by AGRA and the CGA.

Seeing, learning and doing: How Makueni farmer is contributing to her household's food security

Catherine Mbili shows freshly harvested sorghum from her demonstration plot after using regenerative agriculture practices. /Photo: CGA

Smallholder farmers in Makueni County have experienced low productivity over years due to climate variability and poor farming methods. Food security experts hold that limited access to extension services have far reaching effects on household food security. They train, reach out to farmers and provide farmers with important information on better agricultural practices. Makueni county has 193,531 farming households against 176 extensions officers, compared to the recommended ratio of one extension officer to 1,099 farmers (FAO). It is challenging for this small number to reach as many farmers, and so many smallholder farmers are left out on the new agricultural technologies and modern farming practices that produce enough food.

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"I have had about 40% increase in crop yields,"
she says.

In October 2020, CGA introduced Regenerative Agricultural (RA) practices in Makueni as part of the AGRA initiative to transform Africa's smallholder farmers as agents of food security. RA uses the VBA model to address the challenge of extension workers in Makueni county. VBA are recruited from among lead farmers and trained on regenerative agriculture practices and business development topics.

RA operates on the basis of learning by doing. The VBA develops demonstration sites called 'mother demos' to showcase the difference in productivity resulting for either RA or conventional practices. In Makueni, 114 VBAs who were recruited and trained, established 127 mother demos.

Catherine Mbili is one of the VBAs. She has established mother demo plots to showcase how to increase production through the use of RA practices such as minimum soil disturbance or zero tillage, cover cropping, inter-cropping, crop rotation, organic manuring, use of organic mulch, agroforestry, planting drought tolerant crops, use of certified seeds, and soil and water conservation structures such as terraces and basins.

"I made a mother demo plot consisting of four plots and planted sorghum and green grams, where in one plot, I used the recommended RA practices.

On the second plot I used only manure, the third one I used only fertilizer, and on the fourth plot I planted the same crop without any agronomic practice as a control," says Mbili.

She added: "The yields from the plots varied. The first plot had high yields. The second one had less production, the third one had lesser production while the fourth plot had very low yields".

As a result of applying the RA practices on the first plot, Mbili harvested 70 kgs of sorghum from a 10 by 15 metres plot; 20 kgs from the second plot; and 5 kgs from the third plot. She, however, did not harvest anything from the fourth plot where she did not apply any RA practice.

"I have had about 40% increase in crop yields," she says.

As a result of the success of her mother demo plots, Mbili has reached 171 farmers through training and open field days. These farmers, she says, have expressed interest in applying the RA practices in their respective farms just as they learnt them from the demonstration plot. The demos have provided opportunity to diversify crops using inter-cropping, she adds.

Why healthy soil means better yields, healthy family for Benjamin Mbelezi

Benjamin Mbelezi, a farmer in the Eastern Region of Kenya. Photo: CGA

For Benjamin Mbelezi, a 67-year-old farmer from Makueni, the year 2020 marked a dramatic shift in his life as a farmer. For the first time, in many years, his maize farm yielded beyond his expectation.

Mbelezi has always been a farmer, but with limited access to the right information that would enable him improve his farm yield. Extension service officers who are government employees and support farmers with the right information are hard to come by, and so, like other farmers, he contends with conventional farming methods which evidently produces low harvest.

"Extension officers are very few, so getting advises to farming was a challenge for me," says Mbelenzi.

When CGA introduced regenerative agriculture in Makueni, Mbelenzi was trained by a VBA on the practices. He learned new farming techniques for

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"Before I started to use RA and CSA practices and technologies, I would only harvest 4 bags (each 90kg) of maize from my 1-acre farm. With RA, I harvested 15 bags of 90kg. I sold 7 bags at KES 28,000 (USD280) bought certified seeds for the current season. The remaining will take the family through to the next season,"

crop production such as: minimum tillage, cover cropping, inter-cropping, crop rotation, use of organic manure, agroforestry, soil and water conservation structures such as terraces and planting basins. He also learned about climate smart agriculture (CSA) techniques such as drought tolerant crop, use of quality seeds, and post-harvest handling and management skills. As a requirement, each VBA established a comparative demonstration plot to show the results of different techniques.

Mbelezi established two demonstration plots measuring 10 by 10 metres each. In one plot, he adopted four Regenerative Agriculture practices, namely minimum tillage, use of organic manure, inter-cropping, planting basins and zai pits; and in the other, he used conventional farming practices.

The results were distinct. The plants in RA demo plot were healthier and grew to a larger size, and was easier to weed and harvest. "The yields were four times more than the control plot," he says.

He noted that the initial work in land preparation was involving but the results were worth it. *"Unaenda nyumbani ukiwa na furaha mingi sana kwa sababu mazao unapata ni mengi mno* (you go home excited because the harvest is bountiful)", says Mbelezi. Previously, he harvested 4 (90kg)bags of maize from his one acre farm.

Mbelezi is also inter-cropping maize with beans and green grams. He feeds his family on the produces and sells surplus. When family feeds on natural and nutritious food, frequent visits to hospital are reduced, he explains.

"Before I started to use RA and CSA practices and technologies, I would only harvest 4 bags (each 90kg) of maize from my 1-acre farm. With RA, I harvested 15 bags of 90kg. I sold 7 bags at KES 28,000 (USD280) bought certified seeds for the current season. The remaining will take the family through to the next season," he added.

Regenerative agriculture equips Makueni smallholder farmer to cope with erratic weather patterns

After learning Regenerative Agriculture practices to better cope with the effects of climate change, Silvania Monthe, a VBA and farmer in Wote/Nziu Ward, Makueni County, Kenya, shows off the green maize plants in her mother demo plot / Photo: CGA

Silvania Monthe is a farmer and VBA in Wote/Nziu ward, Makueni County. Limited access to extension services made her plant the same crops for many years on the same land thus depleting soil fertility leading to low yields.

Monthe was excited when the Cereal Growers Association (CGA), in collaboration with the Makueni County extension officer, selected her to serve as a lead farmer on Regenerative Agriculture (RA) project. She had suffered yields losses which left her vulnerable to food insecurity.

Monthe spent October to December 2020 rainy season learning about regenerative agriculture and climate smart agricultural practices and

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"At the mother demo, we learn by doing, and benefit from new farming methods by comparing them to our conventional ways," says Monthe.

technologies on a demonstration plot. The following rain season she adopted the practices on her own land. She established a demonstration plot (mother demo) in her farm, which she used to learn and train other farmers as well.

"At the mother demo, we learn by doing, and benefit from new farming methods by comparing them to our conventional ways," says Monthe.

The farmers who learnt at the demo plot noticed plots with improved farming practices showed resilience despite poor rains in the season, and yielded more than double the amount of maize in the control plot. The section planted with conventional methods had dry soil and maize stalks with yellow leaves; a sign of nitrogen deficiency. Where Monthe planted maize with legumes, the maize stalks were greener, taller and visibly stronger, showing resistance to the effects of climate change.

"In plot measuring 10 by 15 meters (baby demo), I used RA practices such as minimum tillage, organic manure, mulching and inter-cropped pigeon peas, beans and maize. I harvested 7.4 kgs of beans and 50 kgs of maize. In the other plot without RA practices, I harvested 5.6 kgs of beans and 20 kgs of maize," she says.

Monthe is not alone in her success. More than 14,000 farmers trained in the Regenerative Agriculture project through mother and baby demo plots have seen improved crop production and crop resilience on their farms after using RA practices and technologies. Monthe's demo farm hosted a field day attended by 136 farmers.

In the following season, she expanded RA practices to her 3-acre farm where she uses minimum tillage, inter-cropping, crop rotation, cover cropping, organic manure and agro-forestry. Eighty-seven

(87) other farmers in her village have also put at least one acre of their farms under RA practices and technologies. "Through the regenerative agriculture practices, the farmers can now engage in more rewarding farming," she says.

For Monthe, RA means more resilience, which leads to more food to feed her children, more produce to sell, and more income to support her family and stocking her agrovet shop. She is currently sharing these practices and results with 150 other smallholder farmers in her community.

Monthe winnowing maize grains from her mother demo plot in Wote/Nziu Ward, Makueni County, Kenya /Photo: CGA.

From a town job to a model farmer, the story of Justus Kimeu

Justus Kimeu in his farm. He is one of the more than 10,000 smallholder farmers trained in AGRA's Regenerative Agriculture project, implemented by CGA in Makueni county.

Makueni County continue to experience adverse effects of climate change such as unpredictable rain patterns, land degradation and declining soil fertility. For smallholder farmers, limited access to extension services and weak input and output market linkages continue to undermine agricultural productivity, leading to food insecurity, poor household nutrition and weak economic resilience.

In 2020, Cereal Growers Association (CGA), in partnership with AGRA, started implementing the Regenerative Agricultural (RA) project to improve food security and community ecosystems resilience in Makueni county. The project involved training farmers and extension agents to integrate regenerative agriculture and climate

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"Like in any profession, agriculture needs training and practice."

smart practices and technologies among smallholder farmers. The approach involved recruiting and working with Village Based Advisors (VBAs) to provide community-based public-private extension system in the county, as a vehicle to entrench the RA practices.

In 2007, Justus Kimeu, now 46 years old, decided to resign from his town job to fully engage in farming at his rural home in Makueni. But for 14 years he struggled as he just lived off farming, and in his own words, "with limited knowledge of farming".

"Like in any profession, agriculture needs training and practice," he adds.

In 2020, Kimeu got in touch with a VBA in his village who had established a mother demo plot on his farm. They both came from the same village but Kimeu's farm was not doing as well as those on the mother demo. The VBA took him through the RA practices and also asked him to establish his own demonstration site (baby demo) to practice them. He set up the demo plot and scaled out the RA practices on his farm.

"Since I started using these regenerative agriculture practices and technologies, my production cost has decreased between 20-30 %. My crop yields have also increased from 2 bags of 90 kg each per acre to 8 (90kg)bags per acre. Today, I have no regrets taking on farming as my source of livelihood," says Kimeu.

On his farm, Kimeu plants different crops every season in order to increase moisture and fix nitrogen in the soil. He has also planted over 1,000 trees around the farm to act as windbreakers. He incorporates cover crops such as beans, green peas and pigeon peas, pumpkins, sweet potatoes and watermelon to aid in weed management and prevent direct sunlight exposure to the soil.

With the income from his farming, Kimeu is able to pay for his children's education and invest. In his village, he is currently considered a resource person on the use of Regenerative Agriculture and Climate Smart Agriculture practices. Many smallholder farmers from Kathiani village are inspired by his success as a model farmer. Recently, he was appointed the chairperson of Makueni conservation farmers community group. Through this platform, he shares knowledge and information on RA practices to fellow farmers.

Helping Makueni farmers understand soil health and aggregation is Wanza's way of building resilience

Immaculate Wanza: "It is a bumper harvest, thanks to CGA." Photo: CGA

Five years ago, Immaculate Wanza, a 40-year-old mother of three, had nothing to celebrate from her hard labour on her farm in Makueni County. The perennial droughts and poor soil fertility affect farming efforts, and results in low crop yields.

In the year 2020, Cereal Growers Association in partnership with AGRA recruited Wanza as a Village Based Advisor (VBA) and trained her among 114 others on Regenerative Agriculture and Climate Smart Agriculture practices and technologies. Her role was to train farmers as well as aggregate demand for input and post-harvest supplies. The project ensured that she became an active change agent that teaches farmer by doing and showing. She chose to plant improved sorghum seed variety known as SC smile, cowpeas, green grams and maize. She applied inter-cropping and minimum tillage as regenerative agriculture practices.

> "Introducing RA practices to Kwethelu village has transformed our way of thinking and renewed our hope. I did not know about use of cover crops, mulching and inter-crops of legumes with cereals. I planted sorghum before, but they only grew to about 2 feet. With RA, the sorghum has grown tall with healthier grains," says Wanza.

She also used agroforestry, cover crops, terracing to reduce soil erosion, mulching to keep the soils moist, and dug basins to conserve water. She also used manure to give the topsoil the texture of a virgin fertile arable land.

The results of her efforts have been dramatic. From harvesting only 70 kg of sorghum in her 0.75-acre farm previously, she harvested 366 kilograms from the same parcel after applying these agricultural practices. Her maize production has also improved, from initial bag or two of 100 kgs from half an acre, to 6 (100kg) bags.

What excites her is that her family will be food secure from the increased output.

"Introducing RA practices to Kwethelu village has transformed our way of thinking and renewed our hope. I did not know about use of cover crops, mulching and inter-crops of legumes with cereals. I planted sorghum before, but they only grew to about 2 feet. With RA, the sorghum has grown tall with healthier grains," says Wanza.

Building Linkages

Through CGA linkage with value chain actors, Wanza has organized linkage meetings and trainings between farmers and output buyers. She has aggregated demands for Hermetic storage bags and other post-harvest handling technologies. She also aggregates seeds and other relevant inputs for farmers thereby increasing her net income from about Ksh. 6,000 (about US$ 54) to Ksh. 20,000 (about US$ 181) a month.

Drought does not scare Wanza anymore. She is confident that the regeneration of soil will build capacity for improved vegetation cover and without compromising food security.

Mutunga's big maize cobs and a testimony

Cosmas Mutunga, a farmer, shows off his demo plot where he has adopted the regenerative agriculture practices.

For the 37-year-old Cosmas Mutunga, getting low yields from his one and a half acre farm in Ukia ward in Makueni county has been a normal occurrence over the years despite his hard work.

For instance, he has been getting 7 (90kg)bags of maize from one and a half acres of land. In addition, the farmer has not been getting extension services so that he could get advice and knowledge on how to go about farming.

In September 2020, Cosmas was, together with other farmers, trained by his Village Based Advisor (VBA) on Regenerative agriculture (RA) through a project funded by AGRA and being implemented by Cereal Growers Association in Makueni county. The project aimed at improving food security, community and ecosystem resilience through adoption of regenerative agriculture practices which include minimum tillage, cover-cropping, use of organic manure, crop rotation, inter-cropping and mulching among others.

After the training, Cosmas established a baby-demo plot on his farm where he planted maize inter-cropped with beans, and applied organic manure and minimum tillage. He also ensured correct spacing and crop protection.

Besides the training, the project linked Cosmas to different seed companies for

> **"At the end of the season, I got 25 bags (of 100Kgs) each of maize contrary compared to 7-8 bags which I used to get before,"** he says.

certified seeds such as Duma 43,419, Dk 8033, Dk8031 and Pannar 3m-05. With the project's facilitation through the VBA, he established demos on his farm where he experimented with the inputs from these companies. After planting the certified seeds, he applied organic manure and mulching. "At the end of the season, I got 25 bags (of 100Kgs) each of maize contrary compared to 7-8 bags which I used to get before," he says.

The following season, his yields increased to 30 (100kg) bags of maize despite experiencing little rain. He sold the maize to a nearby school at Ksh 62,500 (about US$568), money which he used to cater for expenses for his school-going children as well as to purchase certified seeds for the next season.

He urges other farmers to adopt regenerative agriculture practices as it will increase their yields and make farmers in the county food secure.

Makueni youth reaps big from private extension services

Daniel Munene (Left), a VBA, doing purchase and market linkage to a farmer at his aggregation store.

Necessity is the mother of inventions. This adage fits so well with some youth in Makueni county, Kenya, who at the face of sinking economies and rampant unemployment, have slowly made strides in reinventing themselves to earn a living through farming. They also offer extension services to farmers.

Daniel Munene, a 25-year-old youth and a farmer, is one such youth who knows this adage just too well. He graduated with a degree in procurement and logistics but could not get a job. He had to venture into agriculture to earn a living. In October 2020, Daniel was trained as a village based advisor (VBA) by Cereal Growers Association. He is one of the 114 VBAs who participated

"I would like to urge my fellow youth to change their mindset. My advice to young people, especially university graduates, is that sometimes it's good to assume that you've no papers and imagine what else you could be doing. If you are passionate about farming, go for it, especially if the land is available because it pays handsomely,"

in the training sessions and who later joined 1,3453 farmers in open field days to further disseminate the regenerative agriculture practices and technologies. "After being trained as a VBA, I am happy to report that I trained at least 300 farmers on the practices," he says.

Through the VBA model, Daniel states that he has been able to network with input suppliers, financial services providers and other VBAs. "This has helped me to broaden my knowledge on agriculture and especially the regenerative agriculture practices. Having been linked with input suppliers, Daniel has been able to offer and deliver inputs to farmers he has trained at a commission. He delivered 8 bales of KATB1 (certified maize seed) at a commission of Ksh 50 from each packet, earning him Ksh 4000; 9 bales of DK8031 (certified maize seeds) at a commission of Ksh 60, earning him Ksh 5400; 13 tarpaulins each earning him a commission of Ksh 300; 36 AgroZ grain storage bags at a commission of Ksh 50 earning him Ksh1800; and 26 maize shellers each at a commission of Ksh 20, earning him Ksh 4,000. At the start of March –April- May season, Daniel was

able to offer input linkage of 131 bags of fertilizer at a commission of Ksh 200 per bag, earning him Ksh 26,200. On average, Daniel earns a commission of Ksh 15,000 monthly and this has enabled him to sustain his livelihood.

As a result of this, Daniel was identified by Farm Shine Ltd as a trainer of trainees, whereby he offers market linkage between farmers and the organization. He has been able to help in aggregation and purchase of 300 bags of beans, earning him a commission of Ksh 30,000. "From all these commissions, I have been able to expand my farm, from 1 acre to 3 acres, drilled a borehole and acquired a solar pump to enable me to carry out irrigated farming, "says Daniel.

"I would like to urge my fellow youth to change their mindset. My advice to young people, especially university graduates, is that sometimes it's good to assume that you've no papers and imagine what else you could be doing. If you are passionate about farming, go for it, especially if the land is available because it pays handsomely," he adds.

Increased yields and increased savings gives Kaiti's Florence a better house

Florence Maluni, a farmer from Ndule village, Kaiti Sub-County standing in front of her refurbished house.

High production costs and low yields have for many years made Florence Maluni incur huge losses from her 4-acre farm in Ndulu village within Kaiti sub-County of Makueni County. She could not even participate fully as an active member of the Katondoloni cereal bank group due to her low yields.

In October 2020, Florence and her fellow members of the Katondoloni cereal bank group (19males and 24 females) were trained by a Village Based Advisor on Regenerative Agriculture practices and technologies. The training was done through the AGRA supported Regenerative Agriculture project, implemented in Makueni County by

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"Since I got trained I started using ripping services and my production has gradually increased," she says.

Cereal Growers Association. The project aimed at improving food security, and community and ecosystem resilience through adoption of regenerative agriculture practices and technologies among small holder farmers.

After the training, which focused on mulching, use of minimum tillage, inter-cropping, use of cover crops, and use of organic manure, Florence applied minimum tillage, mulching, inter-cropping, use of organic manure, agro-forestry and use of cover crops, on her 4-acre farm.

"Since I got trained I started using ripping services and my production has gradually increased," she says. She explains that she has also been able to cut on costs that accrued due to increased labour needs.

Through the use of cover crops in her farm, Florence has cut down costs associated with weed control since the cover crops curbed growth of weeds. "This has made me save money that I would use to pay casuals to do weeding on my farm," she explains.

"My production costs on my farm was around Ksh 50,000 (about US$455) per season since I had to pay casuals to do the planting, weeding and harvesting. But since I was trained on RA I only spent Ksh 10,000 for the whole season.

She has channeled the saved cash towards renovating her house as she plans to integrate more RA practices on her entire 4-acre farm.

Gladys Waita embraces good farming practices to be food secure

Gladys Waita at her farm where she has practiced mulching.

Fifty-year-old Gladys Waita, a farmer from Mutomboa village in Kaiti sub county of Makueni, is a member of Kyamwoni/Kyambeke Cereal bank, which consists of 106 members (34 males and 72 females). Gladys, just like many other farmers in the region, has been practicing conventional farming in a region that experiences depressed rainfall, and lacked knowledge on the use of organic manure as well as the importance of using certified seeds. For years, she has been practicing farming in her 2-acre farm and her yields have always been very low.

In October 2020, Gladys was trained by her Village Based Advisor(VBA), through the Regenerative Agriculture (RA) project being implemented by Cereal Growers Association in Makueni through the funding support of AGRA. Gladys, just like the other 13,453 farmers trained by the project in her county, was trained on regenerative agriculture practices which include minimum tillage, inter-cropping, use of fertilizers, use of good spacing and mulching.

After the training, Gladys applied the practices on her farm. That same season, her yields increased from 3 bags (100kg) to 7 (100kg) bags from the same farm.

"I have had enough to consume together with my family and have not incurred the expense of paying for labour from my pockets but rather from the proceeds of my farm produce," she explains, adding that she wished all the farmers in her village could embrace the regenerative agriculture practices to enable them harvest enough food for their families.

> **"I have had enough to consume together with my family and have not incurred the expense of paying for labour from my pockets but rather from the proceeds of my farm produce,"**

From ordinary farmer to a prosperous Village Based Advisor, Gregory Katiso shows the way

Gregory Katiso, a farmer and VBA from Wote/Nziu ward in his mother demo plot.

Gregory Katiso, a 46-year-old father of two children, is a Village Based Advisor (VBA) from Kavingo village, Wote/Nziu ward in Makueni County. He is a member of Kavingo farmers self help group which consists of 23 farmers .

In August 2020, Katiso, was trained by the Cereal Growers Association as a Village Based Advisor through the Regenerative Agriculture (RA) project supported by AGRA.

The RA project aimed at transforming Africa's smallholder farming to increase income and improve food security through strengthening community-based public private extension in Makueni and Embu counties of Kenya. It promoted the use of regenerative agriculture practices and technologies which include inter-cropping, use of certified seeds, mulching, crop rotation, use of organic manure, minimum tillage, agroforestry, use of cover crops, microdosing, and soil and water conservation structures such as planting basins, terraces and Zai-pits.

Katiso got the training opportunity after he was recommended by the Ward Agricultural Officer who was impressed by some of his good agricultural practices in his farm. He is one of the

Katiso has created demand on services he offers ranging from supply of certified seeds, farm inputs, spraying crops at a fee and consultancy services.

114 VBAs the project trained on how to increase farm production through the use of RA practices and technologies.

After the training, Katiso established a mother demo plot (15 m by 10m) and applied different RA practices including mulching, use of cover crops, use of manure and microdosing. Through the demo, he has trained 200 farmers who have started applying the RA practices in their respective farms. This include 23 of his fellow members of the Kavingo farmers self help group.

Through the training and his VBA work, Katiso has created demand on services he offers ranging from supply of certified seeds, farm inputs, spraying crops at a fee and consultancy services. During the October - December short rain season, he earned Ksh 10,000 (about US$99) from the services he offers. Gregory also offers motorized sprayer services to farmers whereby he lends the motorized sprayer at a cost of Ksh 300 (about US$2.7) per day.

"Last season I was able to lend the sprayer to at least 10 farmers earning an income of Ksh 3000 (about US$27). After training the farmers on the use of motorized sprayers, 10 farmers ended up buying them from me at a cost of Ksh 6500 (about US$ 59) yet I got them at Ksh 6000 (about US$54), hence making a profit of Ksh 5000," says Katiso.

Gregory also offers agrochemical supplies to farmers whereby through CGA he has been linked to different input suppliers. He works closely with Makamithi and Lukenya Agro vet where he gets the supplies. Katiso has focused on being an agent for agro-dealers in Malivani area. He also offers maize threshing services during harvesting season as well as sale of hermetic bags for storage of grains after training the farmers on post-harvest management practices. This earns him roughly Ksh 5000 (about US$45.5) on commission.

From his VBA work, Katiso earns Ksh 10,000 (about US$99), on average, every month. This has assisted him in buying inputs for his pixie orchard besides providing for his family needs.

"I wish more young people could focus on investing in agriculture as it is a sustainable source of livelihood," he adds.

Saving production costs through cover crops: Mercy Musyoki's story

Mercy Musyoki in her farm where she has practiced use of cover crops.

Just like many other farmers in her village in Muani, Kaiti sub-County of Makueni County, Mercy Musyoki, 38, has been using oxen drawn plough to till her farm. The mother of four who is a member of the 12-member (9 males and 3 females) Matithini Self Help group has been getting low yields as a result of tilling and planting the same crop in the same piece of land each season for a long period of time.

In October 2020, Mercy and her Matithini Self-Help group members were trained by a Village Based Advisor (VBA) on Regenerative Agriculture (RA) practices which include mulching, use of organic manure, cover cropping , mulching and minimum tillage. The training was conducted through the Regenerative Agriculture (RA) project supported by AGRA and implemented by Cereal Growers Association in Makueni County and which aimed at improving food production and technologies using the Village Based Advisor Approach. In Makueni County, the project trained 14,917 farmers (67 percent of whom are women and 31 percent youth) on the RA technologies and practices.

After the training, Mercy established two baby demo plots, each measuring 10 metres by 10 metres, on which she applied a number of RA practices such as use of organic manure, minimum tillage, mulching and inter-cropping.

Besides the baby demo plot, she inter-cropped maize and beans and used organic manure on her 2 acre farm. As a result of these interventions, despite depressed rains experienced in the last season, Mercy's yields from the 2-acre farm increased, from 6 (90kg)bags - 8 (90kg)bags, to 15 (90kg)bags. She has also planted pumpkins in her farm as a cover crop and this has helped her curb the outgrowth of weeds, hence enabling her to save on costs relating to weed control. "I have been able to cut down on expenses when it comes to weeding through the use of cover crops in my farm," says Mercy. She wishes that more farmers in the county would adopt the use of the RA practices in order to minimize production costs and maximize yields from their farms.

New knowledge means increased yields for Kyalo
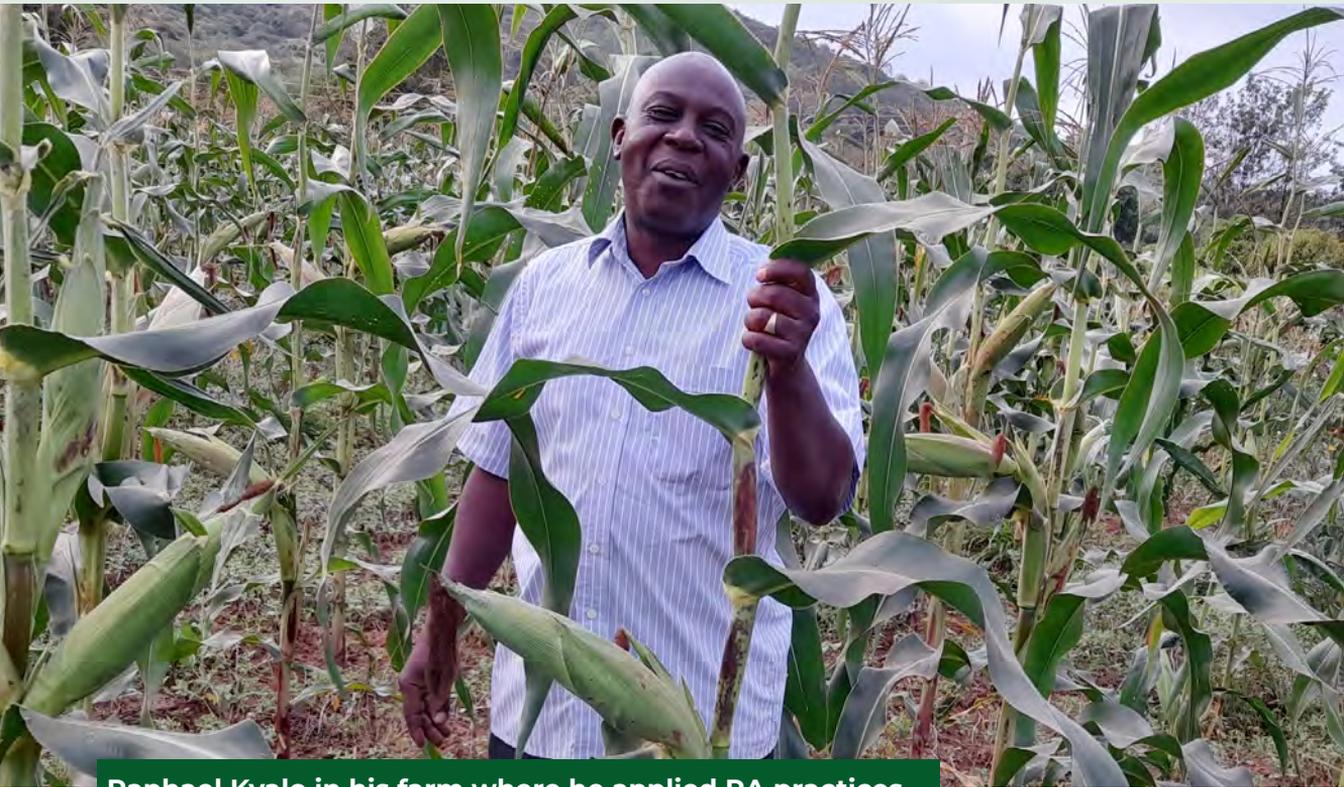
Raphael Kyalo in his farm where he applied RA practices.

For many years Raphael Kyalo, 60, has been doing conventional farming in his 2-acre farm and his yields have gradually decreased with time. The father of three from Mumbuni village, Muvau Kikuumini ward, within Makueni sub county, tilled his land using ox-drawn plough. He planted seeds recycled from his old crop and each year, he ploughed the same farm and planted the same crop; maize, even as the rains dwindled.

This happened until October 2020 when he met Vincent Muthoka, a Village Based Advisor (VBA) trained by Cereal Growers Association (CGA). "Before I met Vincent, I lacked proper farming skills, and just did farming for the sake of farming just like it is our norm during the onset of rains. This was until Vincent came and trained me on Regenerative Agriculture practices," he says.

"In the past I used to plant crops without using organic manure. This season I did apply manure and mulching and it's evident that my yields are better compared to the previous seasons.

Raphael is one of the 13,453 farmers in Makueni county who joined the Regenerative Agriculture project, implemented in the county by the Cereal Growers Association (CGA) through the funding support of AGRA.

"At first I never trusted, or rather, was interested in what he (VBA) taught me since I was used to getting low yields of less than 90kgs in my 2-acre farm. To clear my doubts, the project took me for a peer-to-peer training to one of the farmers who had practiced the regenerative agriculture practices last season. To me, that was the biggest challenge that really happened to me, hence I made up my mind to try the practices," says Raphael.

From the peer-to-peer training and with the help of the VBA, he learnt farming practices such as land preparation, manure application, mulching, proper spacing, use of certified seeds, inter-cropping and crop rotation.

To increase his knowledge on the RA practices, the project ensured he attended 2 field visits organized by CGA and, as a result, got to experience hands-on field demonstration at mother demo plot established by other VBAs.

As a result, Raphael has adopted a number of Regenerative Agriculture practices such as minimum tillage, use of cover crops, use of organic manure, integration of trees in his farm as well as terracing. "In the past I used to plant crops without using organic manure. This season I did apply manure and mulching and it's evident that my yields are better compared to the previous seasons. This season I have harvested 0.5 metric tons from half an acre after application of different RA practices. I have really seen that use of the RA practices leads to increased yields and it is the way to go. The next season I will apply them to the entire farm since I have seen it work in my half an acre plot," he says.

SUCCESS STORIES FROM EMBU COUNTY

Aggregating demands for inputs means more income for Ngurika VBA

Caroline Gakii at her farm in Ngurika village.

At the youthful age of 29, Caroline Gakii, a Village Based Advisor (VBA) from Ngurika village, Kagaari south ward in Embu county, has already cut herself a niche as a successful aggregator of farmer demands for inputs.

Each day, Caroline gets orders for inputs from the farmers she trains and those who have picked up the regenerative agriculture practices being promoted through the Regenerative Agriculture (RA) project, which is being implemented in Embu county by Farm Africa through the funding support of AGRA.

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"I used the demo plot to train farmers in my village on regenerative agriculture practices. So far I have trained 250 farmers through the mother demo plot and through group meetings."

The married mother of two who is also a member of the 22-member Ngurika self help group, had for a long time, before the RA project, cultivated her one acre piece of land while recording very low yields of maize and beans. For years, despite putting all her efforts into farming, she got low yields. This was due to poor farming methods.

In October 2020, Caroline was recruited by Farm Africa as a VBA. She was then trained by Farm Africa on regenerative agriculture practices that include: mulching, inter-cropping, agro-forestry, use of manure and fertilizers, use of bio-phosphates, cover-cropping and minimum tillage. She was also trained on business skills, crop spacing, crop protection and crop variety selection.

After the training, Caroline established a 'mother demo' (measuring 10 metres by 10 metres) plot on which she applied several RA practices including use of organic manure, use of bio-phosphates, agro-forestry with gliricidia sepium, and inter-cropping maize and bush beans. She also did mulching.

"I used the demo plot to train farmers in my village on regenerative agriculture practices. So far I have trained 250 farmers through the mother demo plot and through group meetings," Caroline explains.

Farmers who have been trained proceeded to establish baby demo plots (measuring 10 metres by 5 metres) as a means of learning by doing. Others also went ahead to apply the RA practices in their main farms, and this created demand for farm inputs. To meet the farmer demands, Caroline, through Farm Africa, was linked to private input companies like Faida Seed and Pioneer seed. Through these links, she, in turn, links her farmers to these companies for inputs on commission.

For instance, last season Carol earned a commission of Ksh. 11,000 from the sale of seeds, Ksh. 3,000 commission from hermetic bags and Ksh. 1,000 from agrochemicals. Caroline also earns a commission of Ksh. 7,500, monthly, from ACRE Africa through the sale of crop insurance to farmers. Besides the commissions, Caroline's yield has increased from 2 (100kg)bags of maize to 20 (100kg)bags and 30 (2kg) tins of beans. She also does value addition of bananas by making banana flour which she sells at her farmers meetings.

On average, Caroline earns Ksh. 30,000 monthly, on commissions. From her earnings, she started a restaurant business where she earns a profit of Ksh. 700 in a day. She bought a calf for Ksh. 8,000 and a solar panel for Ksh. 9,000. She also took a loan from the VBAs VSLA group which she used to purchase an egg incubator, and currently she sells her chicks through the farmers' training meetings. From the income, Caroline is now supporting her husband in refurbishing their house.

"I wish this project could be rolled out to all counties to create more self employment for the youth," she says.

From manual jobs to successful VBA business: The story of Ann Karimi

Ann (left) and one of her farmers, Ruth, at their demo farm.

Through Farm Africa, Ann has been linked to private sector companies which include certified seed suppliers, fertilizer suppliers, and companies that sell agro-forestry seeds and seedlings. She gets the inputs from these companies at a wholesale price and supplies to the farmers at a retail price. For instance, during the last planting season, Ann earned a commission of Ksh. 7,000 from linking farmers to seed companies. She also earned Ksh. 5,020 from the sale of agro-forestry tree seedlings and another Ksh. 3,000 from the sale of fertilizer for micro-dosing. She also earns a monthly commission of Ksh. 7,500 from ACRE Africa from marketing insurance for maize and pulses crops.

In total, Ann earns an average of Ksh. 15,000 a month from her direct work as a VBA. From her income, she takes care of her ailing mother, buys poultry and livestock feed, and facilitates her transport to farmer training sites. In addition, she has gained confidence to address groups of people, a quality she lacked before the project.

"I plan to get a loan from the VBAs VSLA group that we formed to establish an aggregation centre for soybean produce," she says, adding that she has already identified a market for soybean.

> **"I plan to get a loan from the VBAs VSLA group that we formed to establish an aggregation centre for soybean produce."**

Catherine Njeru gets inspired by bumper harvest

Catherine Njeru with her grand daughter at her maize farm.

For a long time, Catherine Njeru, a 53-year-old farmer from Kamwana village, Kagaari South Ward in Runyenjes sub-County, had been getting low yields on her one and a half acre farm due to continuously tilling the land without applying soil fertility improvers. She could not even produce enough to feed the family.

In November 2020, Catherine, a mother of six, learnt about the Regenerative Agriculture (RA) project from her Village Based Advisor (VBA). This was when the VBA had visited her women group to sensitize its 26 members on the project and how they can improve yields and income.

Together with her fellow group members, Catherine was trained, by the VBA, on regenerative agriculture (RA) practices, which included inter-cropping, crop rotation, cover cropping, mulching, minimum tillage, agro-forestry, micro-dosing, use of organic manure, and use of bio phosphates. They were also trained on good agricultural practices like correct spacing, crop protection and use of certified seed. The training was done through a demonstration farm, 'mother demo' plot, that had been set up by the VBA at his farm. The training was part of the RA project implemented in the county by Farm Africa through the funding and technical support of AGRA.

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Catherine says she is motivated to integrate more RA practices on her farm since she feels food secure and is earning a good income from her farm.

After the training, Catherine established a 'baby demo' at her farm where she planted maize and inter-cropped with beans. She then applied other RA practices including mulching, use of organic manure and micro-dosing. She was impressed with the yields from the baby demo plot and this made her scale out the practices in the entire one and a half acres, where she practiced minimum tillage, use of organic manure and micro-dosing as well as inter-cropping maize and bush beans on her entire farm. She also got certified seeds through linkage by her VBA.

At the end of the season, Catherine harvested 32 (100kg)bags of maize and 1 (100kg)bag of beans compared to 10 (100kg)bags of maize she used to get previously from the same piece of land.

She sold 25 bags of the maize at Ksh 2,000, earning her Ksh. 50,000. She used the money to pay school fees for her two twin children who are in college. She also bought fertilizer and certified seeds for the next season.

Catherine says she is motivated to integrate more RA practices on her farm since she feels food secure and is earning a good income from her farm.

Catherine wishes that the project would offer farmers a starting capital to enable them purchase inputs like certified seeds and fertilizers as well as cater for labour costs since RA is a bit labour intensive. She also urges farmers to practice RA gradually as this will make farming profitable.

For farmer Robert Muchiri, being a VBA means more income

Through the project, Muchiri has been linked to the private sector players and is the current county supervisor for digital weather mapping for ACRE Africa and earns Ksh. 30,000 a month. During the last season he sold 4 (100kg)bags of maize at Ksh 2,000 each, earning a total of Ksh. 8,000 and used the money to pay school fees for his children. Muchiri is using the knowledge on financial management and record-keeping he learnt from the project to manage his income, expenditure and loans. On average, Muchiri earns Ksh. 40,000.

"From this, I can meet all my family needs and pay for my solar panel loan comfortably," he adds.

He wishes that more VBAs could be recruited in the county to ensure everyone is food secure and to create resilience to harsh environmental conditions.

Mr. Muchiri at his demo farm in Karaba village.

Sustaining livelihood through private extension services: The story of Paul Kinyua

Paul at his maize farm.

Paul Kinyua, 32, is a Village Based Advisor (VBA) in Kavangua village, Runyenjes sub-county in Embu County. Paul became a full time farmer practicing crop production, poultry farming and cattle farming after he resigned from his previous job where he was earning KSh. 8,000 per month. Like many other farmers in the area, Paul lacked knowledge on the right farming practices and, as a result, has been getting extremely low yields i.e. 4 bags of maize from his one acre piece of land.

Paul was recruited, in October 2020, as one of the 100 VBAs in the AGRA-funded Regenerative Agriculture project, implemented in Embu county by Farm Africa. After being recruited, he was then trained on Regenerative Agriculture (RA) practices that include: minimum tillage, agro-forestry, micro-dosing techniques, use of bio phosphates, mulching, inter-cropping, use of organic manure and cover-cropping.

Through the demo, Paul trained 60 farmers. He trained another 50 through farmer groups. This has enabled him to create demand for inputs among the farmers trained.

He was also trained on good agricultural practices like correct spacing, use of certified seeds and crop protection techniques. In addition, he was trained on business skills like record-keeping, saving, how to make business plans, marketing and finance management.

Paul then established a mother demo plot on which he applied different RA practices that include use of manure, agro-forestry with Gliricidia sepium trees, mulching, inter-cropping, use of micorrhizae, minimum tillage, and used it as training site for his farmers. Through the demo, Paul trained 60 farmers. He trained another 50 through farmer groups. This has enabled him to create demand for inputs among the farmers trained.

Through Farm Africa, Paul has been linked to private farm input and services providers, something that has enabled him to offer the inputs to the farmers at a commission. This has been a great business opportunity for Paul. For instance, during the previous season,

Paul was able to earn a commission of KSh. 6,000 from Faida and Pioneer seeds. Paul is also providing ripping services to his farmers to enhance minimum tillage. From the previous season he was able to earn Ksh. 24,000 by providing ripping services.

Other than being actively in business as a VBA, Paul's yield on his one acre of land has increased to 15 (100kg)bags of maize and 20 (2kg)tins of beans. From the previous season, Paul earned KSh. 40,000 from selling the cereals he got from his farm. He used the money to buy two calves at KSh. 14,000 each and also constructed a poultry house at Ksh 20,000 where he is raising 400 chicken through a youth project he started.

To Paul, the regenerative agriculture project has greatly empowered him with knowledge and finances, and he now earns an average of KSh. 17,000 a month.
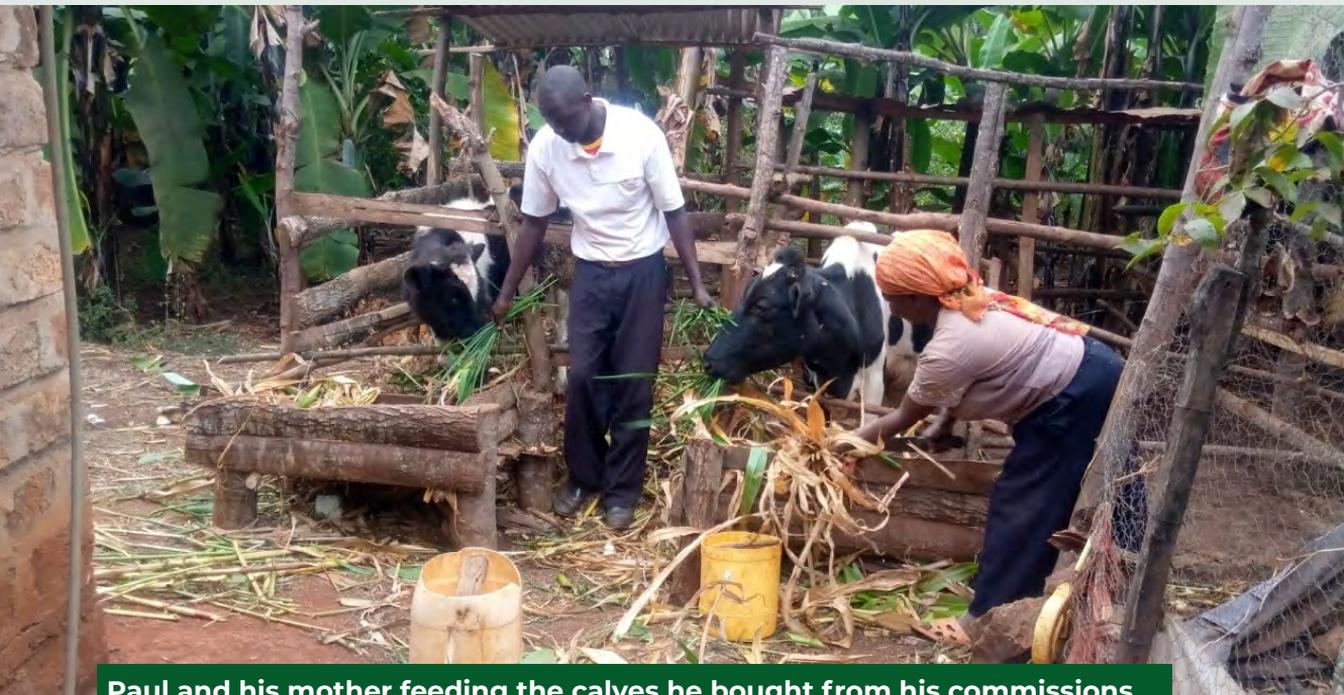
Paul and his mother feeding the calves he bought from his commissions.

Reuben Ngari doubles his yield in one season

Rueben Njiru Ngari at his maize farm.

For many years, Reuben Njiru Ngari, a 65 year old farmer from Kavangua Kithunguthia village, Kagaari South ward in Embu County, has been experiencing reduction in yield season in season out. This is because of declining soil fertility due to continuous cultivation without replenishing the soils. Also, the conventional maize seed; 'kiembu' variety, which he has been using since time memorial, has become less productive with time.

In November 2020, Reuben got a new experience when he was trained on Regenerative Agriculture (RA) practices by his Village Based Advisor (VBA), through an AGRA-funded project implemented in Embu county by Farm Africa. During the training, he was shown how to regenerate the soil using RA practices such as minimum tillage, use of organic manure and fertilizers, mulching, agro-forestry, inter-cropping, crop rotation, and cover cropping. Additionally, Reuben was trained on good agricultural practices such as variety selection and use of certified seed, control of pests especially the fall army worm, and correct spacing for maize and beans.

Back at his farm, Reuben applied the knowledge he gained from the training where is practicing RA practices including mulching, minimum tillage, inter-cropping, cover-cropping, and application of organic manure and fertilizer through micro-dosing.

At harvest time, Reuben got 4 (100kg) bags of maize and 2 (100kg)bags of beans from his one acre farm compared to the 2 (100kg)bags of maize and 40kgs of beans he has been getting from the previous seasons.

"This is a good harvest since in the season we received very little rains. Using RA has also lowered my cost of production from Ksh. 8,400 to Ksh. 3,200 as I did not have to use a tractor to plough my farm and also I only did one weeding," he explains.

Reuben is now planning to integrate more RA practices on his farm to increase his yields in the coming seasons. He wishes to encourage farmers around the world to embrace regenerative agriculture in order to bring back the soil to the old productive days.

Its a new beginning for Embu's Mary Mukonyo
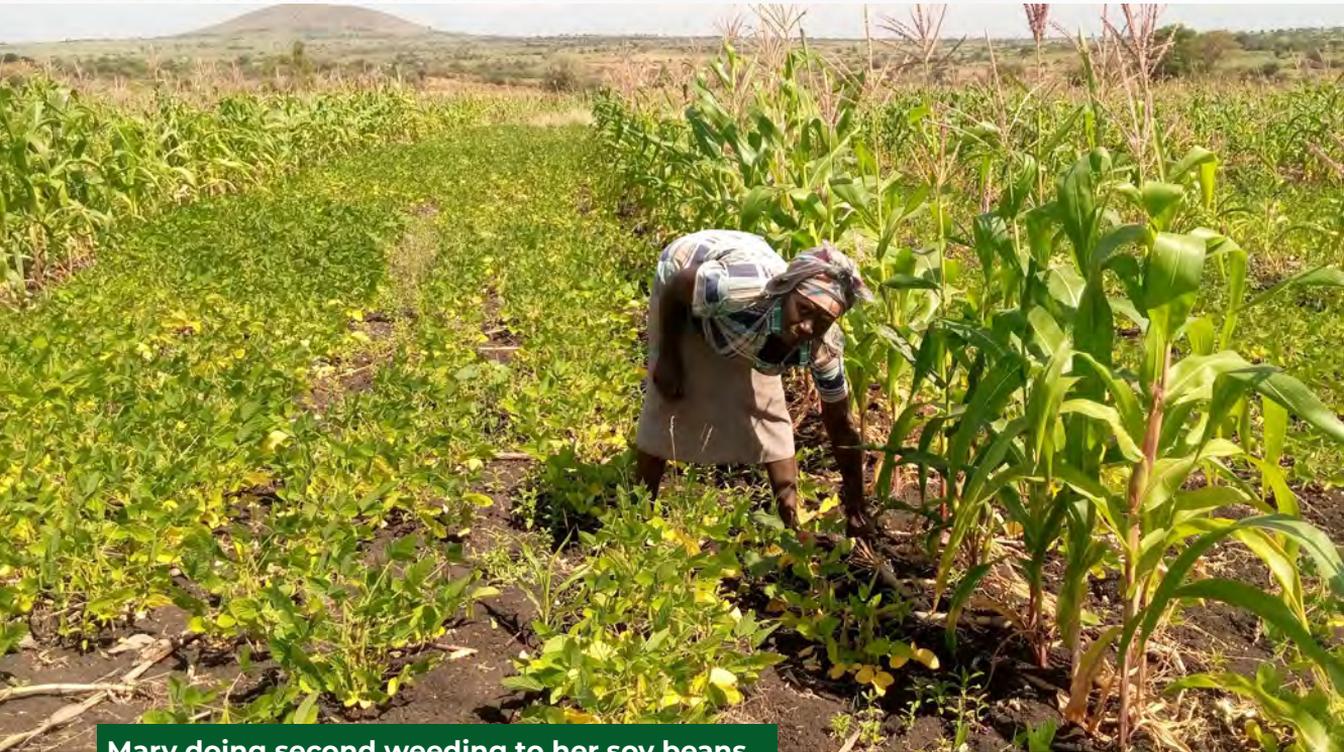
Mary doing second weeding to her soy beans.

Mary Mukonyo, 47, from Kathanyaga village, Makima ward of Mbeere South sub-County is a framer who owns 5 acres of land on which she has been growing green grams and maize crops. She is also a cattle and a poultry farmer on small scale.

Every season, Mary has been using an ox-drawn plough to till her farm where she would later plant maize and green grams as inter-crop. On average, she has been harvesting one (100kg)bag of maize and 5 (100kg)bags of green grams from the 5-acre farm, on a good season. The low yield was attributed to declining soil fertility.

"I am a full time farmer and with that yield I had to put more effort on the livestock since that cannot sustain me," she says.

In November 2020, Mary was privileged to have been chosen by Farm Africa as one of the farmers in her Kathanyaga village to be trained by the village based advisor (VBA) on regenerative agriculture practices. The training was done by Farm Africa which implemented the Regenerative Agriculture project in Embu, through the funding support of AGRA. She had been identified by her neighbor who is a VBA.

"I saw this as a big opportunity for change and decided to register as a farmer as Mr. Wambua (the VBA) stated that more training would be arranged,"

The training happened at the VBA's home where a mother demo plot had been established by the VBA for learning purposes, she says.

At her farm, Mary has adopted minimum tillage, mulching, use of organic manure and inter-cropping just the same way she was trained through the mother demo plot.

"I saw this as a big opportunity for change and decided to register as a farmer as Mr. Wambua (the VBA) stated that more training would be arranged," says Mary. Since then, Mary has also learnt, through the VBA, about other crops like soybeans, and business skills like record-keeping, crop spacing, use of certified seeds, and post harvest handling and aggregation of produce at Mbeere Mwangaza Cereals Cooperative to which she is a member.

Mary has since increased her yield to 3 (100kg)bags of maize and 5 (100)bags of green grams. She has also introduced soybean, as a variety crop, from which she got 80kgs. She sold the 80kgs of soybean at Ksh. 70 per kg, earning her Ksh. 5,600. From this harvest, she now has enough food for her family and poultry. She intends to take part of the produce to their aggregation centre and earn some income, which she would use to buy certified seed, inputs and pay labour for the coming season.

Mary now intends to roll out regenerative agriculture on the whole of her 5 acre land. It is also her wish that her VBA receive more trainings from Farm Africa as this would help them alleviate poverty even with little rains in their area.

Getting farmers to earn more through off-taking and linkages: Margaret Muunde's story

Margaret with her bush beans harvest from her demo plot.

Margaret Muunde is a village based advisor (VBA) from Makima ward, Mbeere South Sub-county. The 54 years old widow doubles up as the chairperson of Makima Cereals Cooperative, which deals with off-taking cereals in the area. Just like many other farmers in the region, she has been getting low yields due to poor farming methods. To compound their problems, the farmers have been experiencing limited access to extension services due to the dwindling numbers of government agricultural extension officers.

In October 2020, Margaret was recruited as one of the 100 VBAs for the Regenerative Agriculture project, implemented in Embu county by Farm Africa, to promote sustainable maize and pulses value chains. The project, with the

> **Currently, through the cooperative, she is selling green grams at Ksh 100 per kilogramme, compared to Ksh 60 offered by middle men, and this will assist farmers to earn more.**

funding support of AGRA, trained her in regenerative agriculture techniques that included mulching, crop rotation, inter-cropping, use of organic manures, minimum tillage, micro-dosing, cover-cropping and agro-forestry. She was also trained on aggregation and financial management.

Margaret, after the training, identified a portion of land, measuring 10 metres by 10 metres, on her farm where she set up a mother demo plot. On the demo plot, she demonstrated different regenerative agriculture practices. These included inter-cropping, mulching, use of organic manure, micro-dosing and cover-cropping. The demo plot served as a learning site where farmers in her village could learn the practices by seeing what has been done. To date, Margaret has trained 250 farmers on regenerative agriculture practices through social gathering at the demo plot, door-to-door training sessions, women groups, and youth groups. She also organizes for field days with the Ministry of Agriculture and this has greatly made it easy for farmers to get extension services. "My aim is to ensure all farmers in this region are food secure," she explains.

She expanded her demo plot to half an acre from which she harvested 2 (100kg) bags of maize and 70kgs of beans. At this point of the project, she explains, she felt the project was way more different from other projects as it focused not only on improving the crop yields but also regenerating the soil. From her 5 acres of land Margaret harvested 2,000kgs of maize and 150kgs of green grams after applying the RA practices, compared to 1,000kgs she used to get before the project. She sold part of the produce earning her Ksh 40,000, money which she used to pay college fees for her son.

With the assistance of Farm Africa Margaret has, through the cooperative, linked farmers in the region to private farm input and service providers. She is also assisting farmers to sell produce through the cooperative. Currently, through the cooperative, she is selling green grams at Ksh 100 per kilogramme, compared to Ksh 60 offered by middle men, and this will assist farmers to earn more.

Resilient Wanja uses learn-by-doing approach to rope in more farmers
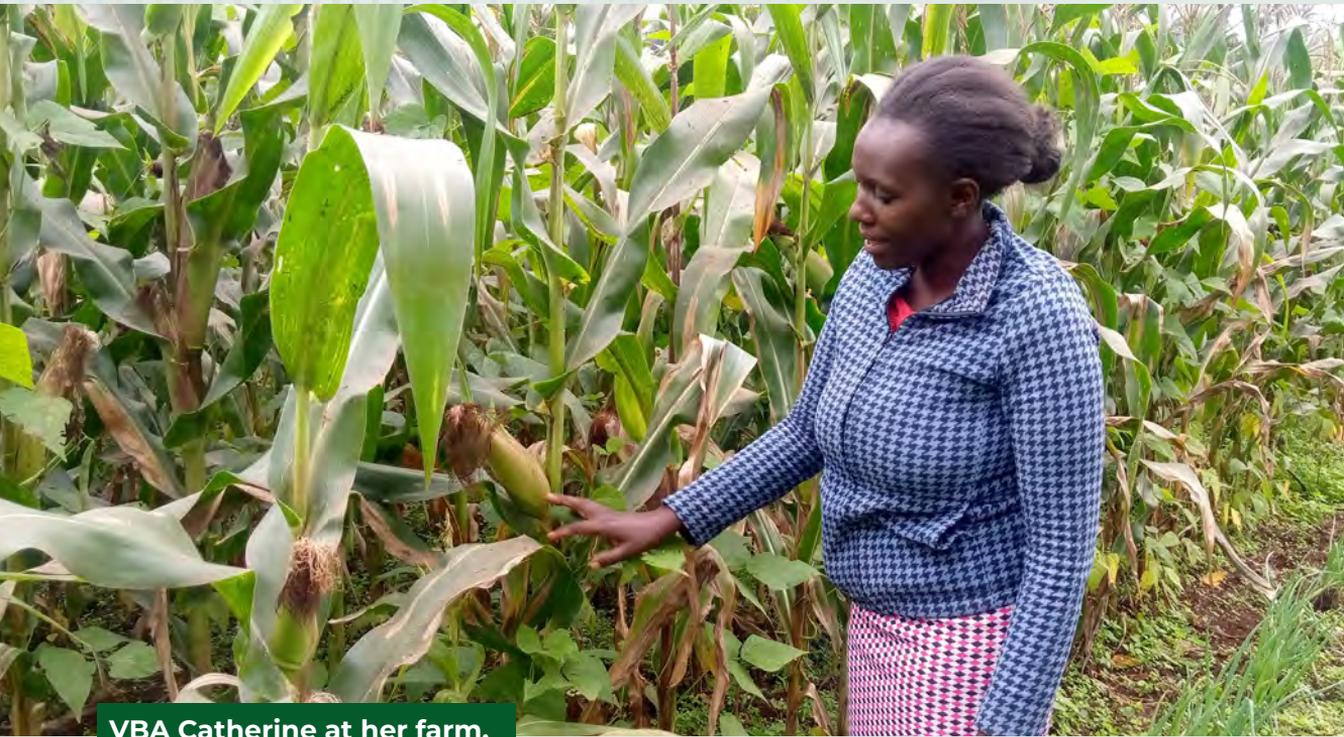
VBA Catherine at her farm.

Catherine Wanja, who hails from Kagumori village in Manyatta sub-County, has been a full time farmer on a quarter acre piece of land for many years. However, the 33 years old mother of one has for some time contemplated quitting maize farming for other crops since its yields have been unsustainable. For the many years, Catherine has been practising single cropping of maize on the small farm every season, and each season she has been getting low yields due to declining soil fertility and depressed rains.

In October 2020, Catherine was recruited by Farm Africa as one of the 100 Village Based Advisors (VBAs) for the AGRA-funded Regenerative Agriculture project in Embu county. After the recruitment, Catherine and her fellow VBAs were trained on Regenerative Agriculture practices (RA) that included inter-cropping, mulching, use of organic

Using the knowledge and skills she got from the training, Catherine has been able to increase her yields from 50kgs to 400kgs (4 bags) of maize and 10kgs of bush beans.

manure, agro-forestry, minimum tillage, use of bio-phosphates, micro-dosing, cover-cropping and use of fertilizers. She was also trained on crop protection, crop spacing, business skills and marketing. The training was done by Farm Africa.

Following the training, Catherine established a mother demo plot, measuring 10 metres by 10 metres, at her farm where she applied the RA practices she had learned. Farm Africa provided her with agronomic advice while setting up the demo plot. She began training farmers on the regenerative agriculture practices using the demo plot as a training ground. She helped the farmers to set up baby demos (measuring 10 metres by 5 metres) which they (farmers) used to learn by doing. She also trained farmers through farmer groups and door-to-door training sessions. So far Catherine has trained 300 farmers in Muthigi, Kagumori and Kathingiriri villages, within Embu county.

Using the knowledge and skills she got from the training, Catherine has been able to increase her yields from 50kgs to 400kgs (4 bags) of maize and 10kgs of bush beans. Also, she aggregates farmer demands for farm inputs, and through Farm Africa she has been linked to private companies like Faida Seeds and Pioneer Seeds from where she sources certified seeds for farmers she trains and offers extension services. From these links, Catherine is able to meet the needs of the farmers while earning commissions in the process. For instance, she earned Ksh 10,000 (about US$90) on commission from sale of seeds during the previous season. She saved the money to enable her purchase inputs, in bulk, for farmers who are not willing to pay for inputs in advance.

Catherine says that she is motivated by seeing her farmers being food secure despite their small farms; of less than half acre. She wishes that more farmers could be trained on regenerative agriculture to ensure there is crop resilience to the changing climatic conditions, and enough food for their families.

Increasing production through regenerative agriculture: Joseph Kariuki's story

Joseph (left) at his farm.

In Embu county, there is a recent trend where farmers are abandoning maize farming for banana and macadamia cultivation. This is because they have been discouraged by low yields they have been getting from maize. The low maize yields have been attributed to lack of knowledge on the right farming practices.

John Kariuki, from Kamviu village, Ruguru Ngandori Ward of Manyatta sub-County, is one such farmer who has had challenges with his maize crop. He is a member of Wikurie self-help group, a farmers group that has been keen on making its members learn skills on coffee production and regenerative agriculture.

In November 2020, through the self help group, a village based advisor working through the AGRA-funded Regenerative Agriculture project, trained Joseph and his fellow members on regenerative agriculture (RA) practices. The training focused on regenerative agriculture practices that included mulching, minimum tillage, agro-forestry, crop rotation, use of organic manure and

fertilizer micro-dosing, and use of bio phosphates. The project was implemented in Embu by Farm Africa.

It was after the training that Joseph established a baby demo plot and practiced use of organic manure, mulching, minimum tillage and use of bio phosphate in different plots to demonstrate learning by doing. He also used fertilizer micro-dosing on all the plots. On another plot, he did not apply the RA practices. This was to act as a control or comparison. Through the VBA, he also learnt about crop spacing, variety selection and crop protection. The results from the demo plots were dramatic and motivated Joseph to scale out.

His production has also increased, from 30kgs of maize, to 90kgs of maize and 10kgs of beans. He has already sold the part of the maize and beans for Ksh. 3,800, which he topped up and bought a calf for manure production. Joseph wishes that more farmers in the county would practice RA in order to make their farming more profitable.

New knowledge for farming gets Atieno more yields

Atieno (right) with her son and Robert Muchiri, a VBA, during one of his visits to her farm.

When growing up, Jacklyne Atieno Nzioka did not get an opportunity to practice any crop farming as she was born in a region where fishing was the major activity. Therefore, she had to learn a lot from her neighbors to farm her land after she got married. However, the skills and knowledge she got from her neighbours were not sufficient to make her realize good yields from her 10-acre farm despite her hard work.

It is not until in November 2020 that Atieno, a mother of two from Karaba Village, Mwea ward of Mbeere South sub-County, was trained, among 10,000 farmers, by Farm Africa on regenerative agriculture (RA) practices. The training was delivered by the local Village Based Advisor (VBA) through an AGRA-funded Regenerative Agriculture project, which is being implemented in Embu county by Farm Africa.

After the training, Atieno applied the different RA practices, including minimum tillage, inter-cropping, use of organic manure and fertilizer micro-dosing, spacing, mulching and use of cover crops, on her 10-acre farm.

"My yields have now increased, from 13 (100kg)bags, to 60 (100kg)bags of maize on my 10 acres of land," says Atieno. From the harvest, Atieno sold 10 bags of maize, earning Ksh. 20,000, and used the money to pay school fees for her son and also to lay foundation for her new kitchen. Atieno also shared some of the produce with her relatives who did not harvest anything.

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"My yields have now increased, from 13 (100kg) bags, to 60 (100kg)bags of maize on my 10 acres of land."

Demo plot whets Manyatta man's appetite for better yields

Gichovi at his maize farm.

Over the years, Geoffrey Gichovi, 50, has been getting less than a 90kg bag of maize in a year from his quarter acre piece of land. This is due to declining soil fertility caused by continuously farming on his small farm without taking care of the soil. More so, the father of two from Kagumori village, Nginda ward of Manyatta sub-County has been planting a maize variety that takes 7 - 8 months to mature; a practice that most farmers in the region have been using.

In November 2020, Gichovi learnt about regenerative agriculture from his neighbour's baby demo plot. The neighbour had been trained, through the Regenerative Agriculture (RA) project implemented in the County

"I was quite impressed by how beautiful the demo plot looked, and I wanted my farm to also look like that."

by Farm Africa through the funding support of AGRA, by his Village Based Advisor (VBA) on regenerative agriculture practices.

"I was quite impressed by how beautiful the demo plot looked, and I wanted my farm to also look like that," he says.

This made him look for the VBA to enlist for the training. Just like the other farmers in the project, Gichovi was then trained on the use of organic manure, use of fertilizers, mulching, inter-cropping, minimum tillage, agroforestry, crop rotation and other good agricultural practices such as spacing, crop protection and post harvest handling of maize.

After training, Gichovi prepared his land and applied minimum tillage, and planted maize and climbing beans inter-crop. He had been linked to certified maize seed by his VBA. He also used organic manure, micro-dosing fertilizer, and also followed keenly the VBA's advice on spacing and crop protection.

From his quarter acre plot, his yields increased from a quarter (100kg)bag to 2 (100kg)bags of maize and 2 (2kg)tins of beans. He is also happy that the maize has matured in 3 ½ months compared to the conventional one that took 8 months.

"Our pieces of land have reduced over the years due to fragmentation and with low production we have been experiencing as farmers, we have been very food insecure. However, with regenerative agriculture we will be able to do commercial production from our small farms," he explains.

From his last season's harvest, Gichovi currently has enough maize and beans to feed his family and poultry. He says this has lowered his cost of living.

"I wish more farmers could be trained on Regenerative Agriculture so as to maximize on production within the country where many farmers have already abandoned maize farming due to low yields," he adds.

No.	NAME	ORGANISATION	POSITION
1	Mary Nyale	Farm Africa	Program Manager
2	Caroline Karuitha	Farm Africa	Communication officer
3	Alice Kimotho	Farm Africa	Admin/Data officer
4	Patrick Nyaga	Farm Africa	Project Coordinator
5	Godfrey Githinji	Farm Africa	Project Officer
6	Eric Charles Koome	Farm Africa	Project Officer
7	Eliud Kagete	KALRO	Natural Resilience management SCAO-KAITISC
8	Genesios Muriithi	MoAILFD, Embu	Sub County Agricultural Officer
9	Silas Muchiri Robert	Farm Africa	VBA
10	Francis Fundi	Farmer	Farmer
11	George Mabuka	CGA	Program Coordinator
12	Shadrak Kasonzo	CGA	Senior Agribusiness Coordinator-Makueni
13	Elijah Maithya	CGA	Agribusiness coordinator
14	Linda Chavuya	CGA	PR /Communication
15	Anselm Tony Mwongela	CGA	Monitoring & Evaluation Officer
16	Justus Kimeu	Farmer	Farmer
17	Calroline Ndoni	VBA	VBA
18	Mwanzia Alusa	MoAILFD, Makueni	Natural Resilience management SCAO-KAITISC
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20	Cate Gitonga	SRC	CEO, SRC
21	Richard Wahiu	SRC	Consultant, SRC
22	Violet Nyando	CGA	Policy Advocacy Manager
23	Iydia Kiswii	CGA	Agribusiness coordinator-Makueni
24	Eric Mwaura	IIRR	County Director
25	Urbanus Mutua	IIRR	Program Officer
26	Angella Waeni	IIRR	Project Ass.Officer
27	Mary Kimani	IIRR	Project Ass.Officer
28	Catherine Ndungu	IIRR	Finance &Admin officer
29	Pauline Onyango	IIRR	Admin Assistant Intern
30	Wycliff Omanya	IIRR	Consultant
31	Tervil Okoko	IIRR	Chief Facilitator, Editor
32	Betty Kiroki	IIRR	Knowledge Management Editor
33	Assan Ngombe	AGRA	Resilience Officer
34	Maureen Nyachwaya	Farm Africa	Project Coordinator