Food and Agriculture Organization of the United Nations

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Investing in rural people

SUCCESS STORIES

Enhancing crop and livestock production and productivity in new lands of Kafr El Sheikh, Beni Sueif, Menya and Aswan Governerates through the adoption of innovative climate-resilient agricultural practices and technologies

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Preface

The newly reclaimed lands in Egypt pose a significant challenge for small-scale farmers in achieving high agricultural productivity. The Food and Agriculture Organization of the United Nations (FAO) provides technical assistance to implement the project "Enhancing crop and livestock production and productivity in the new lands of Kafr El Sheikh, Beni Sueif, and Aswan Governorates through the adoption of innovative climate-smart agricultural (CSA) practices and technologies." Following a recent mid-term review of the agricultural investments and sustainable livelihoods project implemented in a section of the newly reclaimed lands, funded by the International Fund for Agricultural Development and the Global Environment Facility trust account, the egyptian government and the fund agreed to explore the feasibility of subcontracting activities related to Farmer Field Schools (FFS), Under the specific component of agricultural production services in the agricultural investments and sustainable livelihoods project to a third party, such as FAO under a separate project. This document represents some of the success stories by the project.

Project outcome

The project will work towards **achieving operational FFS for 3 440 men and women smallholder farmers to adopt sustainable CSA and natural resources management (NRM) practices and technologies** in the: Metobous area of Kafr El Sheikh Governorate in Northern Egypt; Western El Fashen area of Beni Sueif Governorate and Western Samalout area of Minya Governorate in Middle Egypt; and Wadi Al Sa'ida, Wadi El Nokra and Abou Simple areas of Aswan Governorate in Upper Egypt.

Project outputs

The expected outcome of the project will be achieved through generation of the following four outputs

1. 240 national, governorate and community-level stakeholder agencies and organizations demonstrating an increased awareness on the needs of smallholder farming communities in the project areas.
2. The technical knowledge and communication skills of 20 public and private sector "master trainers" and 60 local community-based FFS facilitators enhanced to effectively promote sustainable CSA and NRM practices and technologies through the implementation of FFS.
3. 172 FFS effectively established and implemented for the testing, adaptation and replication of sustainable CSA and NRM practices and technologies by 3 440 men and women smallholder farmers.
4. 172 FFS effectively monitored, evaluated and networked to ensure a continuous learning process of smallholder farmers in the selected governorates.

Introduction

1 Introduction

To achieve the third component of the project, which involves establishing 172 FFS and implementing them effectively for testing sustainable CSA practices and NRM, the FFS approach was adopted.

FFS approach is based on a group learning approach that enhances learning skills and gives farmers the opportunity for critical analysis and improved decision-making by local communities.

Through these activities, participants learn to address their issues through observation, analysis, and testing of new ideas in their fields. This is done through critical thinking, discussions, and decision-making in the context of direct field operations.

In FFS, the focus is on agriculture and local economy-related topics such as soil, crop and water management, seed propagation,

pest control, agroforestry, nutrition, value chains, and market connections. Activities are organized to reflect the entire agricultural cycle, allowing participants to practically apply the knowledge they have gained in their fields.

Participants are encouraged to share knowledge and experiences with each other through observation, discussion, and practical field decision-making. This is done in the direct context of the experimental field, where participants gather and analyse information and data with the help of an agricultural ecosystem analysis group.

Ultimately, the FFS approach enhances community development by empowering farmers and promoting critical thinking and problem-solving skills. These activities are an effective tool for improving agriculture and the local economy, enhancing communication and cooperation among farmers, and achieving sustainable development.

The project "Enhancing crop and livestock production and productivity in the new lands of Kafr El Sheikh, Beni Sueif, and Aswan Governorates through the adoption of innovative CSA practices and technologies" implemented 176 FFS. This included 130 schools for strategic crops like wvheat, maize, sugarcane, as well as vegetables, medicinal, and aromatic plants, reflecting each area's crop composition. There were also 49 schools for animal production (covering fattening of calves, sheep, goats, poultry, and dairy processing), with 17 schools based on expert agricultural advice and 159 based on farmer experiences. Recommendations were integrated into these schools using various methods as agreed

upon in the first coordination committee meeting, combining FAO methodology with technical recommendations from the Egyptian Ministry of Agriculture.

The project introduced 27 new field crop varieties and 13 vegetable varieties to the areas. 47 drip irrigation units were set up, and all schools were supplied with the necessary production inputs (115 production packages) including drip networks, seeds, fertilizers, and nutrients. Over 50 CSA practices were innovated and tested, helping increase production, reduce costs (seeds, fertilizers, pesticides, labour), improve outputs, and enhance resilience and adaptation to climate change, thereby increasing the profitability of the crops covered by the FFS.

As FAO's FFS approach relies on solutions already proven effective in small farmer areas, these schools significantly increased the incomes of small farmers, sometimes by 10 percent to 70 percent. The solutions were suitable for the economic conditions of small farmers, readily available, and accessible near their fields. The schools also reduced reliance on high-cost production inputs, replacing some with naturally available materials, and supported

farmers with more productive and climate-resilient genetic compositions.

The schools implemented by the project effectively saved water and positively changed farmers' attitudes towards modern irrigation methods, aligning with the Egyptian state's plans to increase water use efficiency in agriculture.

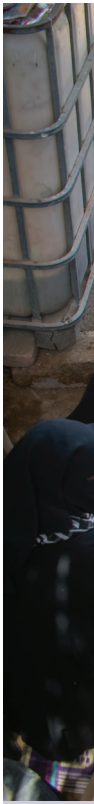
68 facilitators were selected to work in the schools, proving their excellence among 125 trained in the target areas. 26 FFS trainers were prepared to train new facilitators as needed, forming a solid core for sustainable agricultural guidance in the project areas. Additionally, 36 marketing groups comprising 180 active farmers from different FFS were trained in post-harvest handling and marketing basics.

The FFS implemented by the project increased farmer solidarity, supported community resilience, and fostered cooperation, dialogue, and conflict management among farmers, leading to consensus decisions. They also empowered women through participation in dialogue and decision-making.

2

Hussein Manjoud

Overcoming the shortage of veterinary medicines for sheep with garlic as an antibiotic in animal production



This story begins when a team from FAO that with farmers in the villages of West El Fashn in central Egypt to discuss agricultural production challenges in the area and study the major issues negatively impacting the income of small-scale farmers. The sheep farmers, who rely on sheep rearing as a source of income, voiced that their farms were facing a severe problem due to climate changes. The health and productivity of their livestock, especially sheep, were adversely affected by harsh weather fluctuations and temperature changes, leading to the spread of diseases and lack of nearby veterinary services.

Haj Hassan teaching men and women the benefits of using garlic powder as animal feed to enhance the immunity of sheep.

Dry feed alongside garlic as main meals for sheep in Minya.

In this context, Haj Hussein Manjoud Saleh, an experienced sheep breeder, had previously used garlic as a solution to these climate challenges. He decided to seek a natural and effective remedy to enhance the immunity and productivity of his sheep in light of the lack of veterinary services in the village.

"Facing the harsh realities of climate change, we were compelled to find a sustainable solution to protect our livestock. That's when we turned to the power of nature, specifically garlic. Its remarkable properties not only strengthened our sheep against diseases but also paved the way for a more natural, healthy approach to animal husbandry. Embracing garlic was more than a dietary change; it was a step towards harmonizing our practices with the environment and securing a resilient future for our farming community." - Haj Hussein Manjood Saleh

Haj Hussein began learning about the benefits of garlic and its positive impact on sheep health, which also benefits human health. After thorough examination, he directed his team in the sheep fattening school to implement innovative feeding strategies based on garlic. Almost all villagers, who grew garlic and raised sheep, were taught these strategies, providing them with deep knowledge about the active substances and natural antibiotic properties of garlic and its relation to animal diseases. He trained his colleagues on how to prepare and administer garlic to sheep, specifying the right dosage and timing to ensure proper intervention.

Thanks to the continuous efforts and perseverance of Haj Hussein and his team in the FFS, the farm saw significant improvements in the health and productivity of the sheep. The sheep became stronger and more disease-resistant due to regular garlic consumption,

leading to increased feed conversion rates and productivity. These efforts contributed to sustainable sheep breeding and offered an inspiring model for sustainable agriculture in the face of climate challenges.

Using garlic cloves as a biological pest control in sheep feeding led to numerous benefits in productivity and health:

Enhanced sheep health

Using garlic in sheep feed greatly enhanced their health, making them more disease-resistant and stronger against health challenges. Avoiding chemical pesticides and adopting garlic as a biological alternative helped reduce disease risks and improve their overall condition.

Increased appetite

Feeding sheep with garlic led to increased appetite, improving food intake and nutrition, resulting in higher sheep weight and meat quality. This led to better feed conversion rates, enabling farmers to earn more profit from their production.

Natural and safe source

Garlic is a natural and safe source to boost sheep health without the need for harmful chemicals. This increased the value of meat produced, making it a healthier and higher quality product and helped in better meeting market needs.

Environmental impact of garlic

Environmental protection

Using garlic as a biological alternative to chemical pesticides effectively contributed to environmental protection from harmful chemical pollutants. This helped maintain ecological balance and preserve necessary biodiversity.

Agricultural sustainability

Relying on garlic as a biological pest control significantly aids in achieving sustainable agriculture. Adopting such smart, eco-friendly agricultural methods achieved high productivity levels while preserving the environment and public health. The land became healthier and less polluted, enabling long-term sustainable agriculture.

Utilizing plant waste (garlic sorting)

Using lower grade garlic crops for sheep feeding enhanced the value of this crop and maximized its use.

A solution available to most village farmers

The widespread cultivation of garlic in the village makes adopting this solution easy and accessible for all interested sheep farmers.

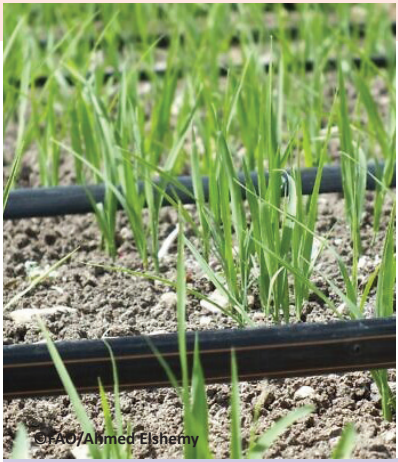
3

Haj Hassan Rehab

The wheat farming champion of drip irrigation in Minya

In the heart of Minya's desert, where newly reclaimed lands suffer from a severe lack of soil fertility and unprecedented increases in fertilizer and nutrient prices, Haj Hassan Rehab undertook an exceptional mission in agriculture. As a father of four daughters and two sons, owning just five acres of land, he faced the same challenges as other farmers, such as high fertilizer costs, water scarcity, and expensive labour. Yet, his story highlights the importance of climate-smart agriculture in enhancing wheat production, a crucial element of food security in Egypt.

Wheat cultivation under different irrigation systems in the West Samalut area in Minya, with drip irrigation proving to be superior.



Wheat cultivation under the drip irrigation system in the pilot fields of the Ministry of Agriculture in the Central Egypt region.

In the preliminary sessions of the FFS for wheat in El Wafa village, the farmers identified challenges like poor soil fertility, high fertilizer costs, and water scarcity. Despite the traditional emphasis on flood irrigation and the skepticism from other farmers, Haj Hassan proposed experimenting with drip irrigation and sprinkler systems, in addition to the flood irrigation method.

Haj Hassan, familiar with the benefits of drip irrigation from his personal experience, offered to use his existing irrigation systems for the experiment, covering the expenses himself. He persuaded the other farmers to compare wheat cultivation under flood, sprinkler, and drip irrigation systems using two wheat varieties, Beni Sueif 1 and the newer Beni Sueif 5.

During the 15 sessions of the FFS covering all stages of wheat cultivation, the farmers closely monitored the crop. On harvest day, they separately harvested and weighed the yield from each

irrigation system for each wheat variety. The results were astounding:

- Drip irrigation yielded approximately 9 tonnes per hectare, compared to 8 tonnes for sprinkler irrigation and 7 tonnes for flood irrigation.
- Drip irrigation also significantly reduced the use of nitrogenous fertilizer by about 60 percent, compared to flood irrigation.
- Drip irrigation protected the wheat from lodging during strong winds due to better root development, unlike the wheat under sprinkler irrigation which partially lodged.

Farmers inspect the sprinkler irrigation system at the FFS Haj Hassan Abu Rehab and an incredible harvest under drip irrigation.

Hassan presents the FFS experience to Ain Shams University students.

- Haj Hassan's successful experiment with drip irrigation not only showcased increased productivity but also highlighted the efficiency in water and fertilizer usage, which is crucial for Egypt's agriculture, especially amidst recent crises affecting wheat security.

Haj Hassan Rehab reflects on this journey: *"After facing the severe challenges of water scarcity and weather fluctuations in Minya, we were determined not to surrender to these harsh conditions. Instead, we embraced innovation and technology, experimenting with different irrigation systems. Our discovery that drip irrigation was the most efficient and sustainable method marked a turning point. This wasn't just about improving wheat production; it was about securing our future.*

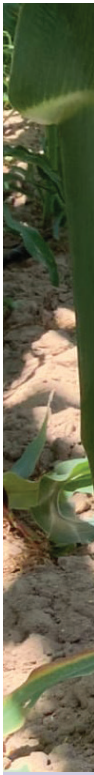
Students from Ain Shams University with Hassan Rehab at the FFS.

By conserving water and enhancing land quality, we're not only addressing immediate production needs but also safeguarding our food security and environmental sustainability. Sharing this knowledge and experience with other farmers is our contribution towards transforming Egyptian agriculture into a smarter, more sustainable practice. Our journey in Minya is a testament to the power of smart agriculture in overcoming adversity and ensuring a resilient future for all of us."

The story of Haj Hassan Rehab and the farmers of Minya underscores the importance of investing in smart agriculture, which can play a crucial role in providing food security and environmental sustainability. This story reflects the strength of technology and creative thinking in improving wheat production and agriculture in general, reminding us of the importance of adopting smart solutions to face future agricultural challenges.

4

Mohammed Hegazi
Transforming the desert into a green haven facing climate change



The village of Al Azima in West Samalut, Minya, faced a significant challenge with high salt levels in irrigation water sourced from groundwater wells in new reclaimed areas. The saline water caused crop yield reductions and land barrenness during summer, especially as temperatures rose to nearly 45 °C, forcing farmers to irrigate more frequently, exacerbating soil salinity and crop failure, thus halving the farmers' income due to summer land barrenness.

Cultivation of maize under drip irrigation in Al-Azima village, West Samalut area in Minya.

Haj Mohammed Hegazi was not just an ordinary farmer; he was an inspiring man with a vision and determination to change the situation in his area and help his fellow farmers face climate challenges, particularly the increasing salinity. Originally a mechanical engineer who devoted himself to farming and a father of a son and a daughter in university, Hegazi owned a modest home he designed himself on his farm. He also personally designed and implemented various agricultural machines, benefiting from his previous experience as an engineer. His innovations in transport machinery for agricultural supplies, animal feeds, spraying equipment, and irrigation networks helped confront the challenging conditions his farm and those of other village farmers faced.

Maize FFS farmers presenting their experience to FAO's FFS specialists from different countries in NENA region.

In the FFS for maize cultivation, Haj Mohammed Hegazi used a well design (a basin) for irrigation, pumping salt treatments and nutrients sustainably through a drip irrigation system for the crops. This system helped dispel the harmful salts away from the maize plant roots. He also led the farmers in the school to use yellow empty containers to create pheromone traps to detect and combat the fall armyworm before it could damage the crop, contributing to the unprecedented success of maize cultivation in the area after farmers had lost confidence due to pressing conditions.

Haj Mohammed Hegazi and his team in the FFS worked continuously to improve water quality and increase productivity. They continued to study and analyse new interventions in maize

on the soil and productivity. The school members proposed planting maize varieties well-adapted to the local conditions with high productivity. Hegazi's mechanical innovations were also used to overcome the summer salinity problems.

These measures resulted in a significant increase in maize productivity, from 1 tonne per hectare before Hegazi's interventions to 6 tonnes per hectare under the new conditions, turning the economic situation of crop cultivation from loss to double profit for the farmers. Areas of barren land were transformed into productive green spaces after the school's farmers adopted what they learned from their neighbor.

This story was not only a success in terms of crops but also in developing the farmers themselves. The FFS enhanced the

farmers' abilities to face environmental and agricultural challenges, fostering a spirit of cooperation, dialogue, and democracy among them.

This story shows how smart and innovative agriculture can bring about a real transformation in the lives of farmers and improve their productivity. It reflects the importance of embracing change and adopting sustainable agricultural technology to face climate and environmental challenges successfully and inspiringly.

In conclusion, the story of Haj Mohammed Hegazi is a true success story in the fields of agriculture and innovation, inspiring many to face challenges and seek positive change in their community through science, technology, and collaboration.

5

Hend Hussein Elevates women to leadership roles in Wadi Al Nokra

Hend Hussein from Wadi Al Nokra was once a marginalized and shy woman with no significant role in her community. She thought her dream of making a significant impact and expressing her personality had ended. However, her life took a remarkable turn when FAO implemented FFS in her village.

Joining the FFS as a beneficiary seeking a role in her community, Hend discovered an environment where women's opinions were heard and valued. This small window of weekly meetings at the

Collaboration between men and women in the FFS of Wadi Al Nokra, Aswan.

FFS, where freedom of opinion and expression was encouraged, amazed her.

Motivated to delve deeper, Hend enrolled in a facilitator training course organized by FAO. This training was more than just a learning opportunity, it was a chance for Hend to discover her potential and acquire new skills. She learned about facilitation skills and their importance in empowering communities, realizing that a facilitator's role is not just to transfer knowledge but also to empower others to gain skills and confidence.

During the training, Hend also learned about climate-smart agriculture. She understood the importance of adapting farming practices to climate challenges and how smart agriculture could help increase crop and livestock production sustainably, eventually leading to increased income for farmers in remote areas.

Returning to her village, Hend, equipped with knowledge and skills from the workshop and continued support from FAO, decided to gather a group of farmers to establish a FFS. However, the significant challenge was the societal norm by which women were not expected to lead.

Initially, when Hend tried to gather the male farmers herself, a disagreement among the members made her fear the difficult nature of her society, which sometimes turns disagreements into major conflicts. She dispersed the gathering and thought she had ruined the school. After reflecting, she asked her husband

Women in Aswan explain to a delegation from the Bibliotheca Alexandrina library how to conduct an environmental agricultural analysis for sheep.

to help gather and manage the male groups while she efficiently managed the female groups alone.

Over time, and through the FFS sessions, Hend evolved into a proficient facilitator. She asked her husband not to accompany her anymore, as she was now capable of managing male groups on her own, following the FFS methodology. She successfully organized two FFS, one for wheat and the other for alfalfa, and exceeded expectations by forming mixed-gender groups, promoting dialogue between men and women, and encouraging women to voice their opinions.

Hend also became a supporter and advisor to her husband in agricultural matters, using insights from the FFS to improve their farm's production. They both learned to listen to each other's opinions, vital for improving the living conditions of their family. The FFS became more than just an educational institution; it was

Women in Wady ElNokra harvesting wheat in the FFS.

a community within the community. Hend gathered farmers of different ages to think together and find solutions to their common challenges. They shared knowledge and experiences and began applying smart agricultural practices, realizing that by working together and utilizing their limited resources, they could achieve better results and efficiently face challenges.

Thus, through her role as a facilitator at the FFS, Hend Hussein transformed from a shy woman to a leader in her community. She played an active role in empowering both women and men, gaining confidence in herself. This story is a living example of how sustainable development and community empowerment can be

achieved through promoting smart agriculture and FFS as effective methods for knowledge transfer and individual and community empowerment.

Hend reflects on her journey, *"I realized that my voice and actions could inspire change. From being a shy woman in the background, I became a leader guiding my community towards sustainable agriculture. This transformation was not just about me; it was about empowering every individual, especially women, to recognize their potential and contribute meaningfully to our community's growth."*

6

Huda and Abeer
Shoulder to shoulder in Wadi Al Sa'ida

In the flourishing south of Aswan, in the Wadi Al Sa'ida area of Edfu, where environmental and living conditions are tough, the FFS project was a beacon of light for Huda and Abeer, two dreamy girls from the village of Al Iman. As participating farmers in the village's FFS, they learned about active participation, critical analysis, and the freedom of expression, realizing the value and impact of their opinions and constructive thinking.

Wondering if they could become facilitators and manage FFS in their village, they took their first step by participating in a facilitators' training course organized by FAO. The five-day training

Abeer and Huda leading the FFS men in Wadi Al Sa'ida.

was a transformative experience, enabling them to pass the final evaluation and become FFS facilitators. The challenge then, was to establish a school comprising 25 male farmers.

How could they convince the village farmers to join sessions led by women? In a community where traditional norms posed barriers, they tried repeatedly, inviting 30 farmers to preparatory sessions, but only five would attend. They stood in roads, after prayers in associations, and at fertilizer distribution points, trying to persuade farmers to join the school. The breakthrough came when Huda's elder brother supported her, helping her complete the required number of wheat farmers in the village.

The hardest session was the first, managing a dialogue with 25 experienced farmers. Relying on her facilitation skills and with Abeer's assistance as a co-facilitator, Huda thoroughly prepared for each session, leveraging technical expertise from the project, village, and her family. She honed her skills and knowledge to such

an extent that farmers regularly attended the sessions, convinced of the school's value in solving some of their problems.

Through the school, the farmers adopted ridge planting for wheat, understood the importance of using balanced, amounts of fertilizers, and optimized field irrigation. Towards the school's end, Huda stood proud of her success and ability to overcome traditional barriers and change misconceptions. She gained a voice, confidence in her capabilities, and recognition in her community.

Huda and Abeer are exemplary models of gender-based transformation, becoming rural leaders in their village. They engage in volunteer work and civil society organizations, helping women access technical information sources. They established several FFS for both women and men and worked with the project to ensure the success of the FFS concept in the village.

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