



“ iNASHR is a dynamic platform for sharing effective farmer-driven experiences and technologies. The project showcases ICARDA's and CGIAR's capacity as research institutions and development partners. ”

Aly Abousabaa

Director General, ICARDA, and
Regional Director CWANA, CGIAR



“ The project was able to meet its objective because of the strong partnership forged with key stakeholders, the strategic thinking behind packaging the innovative solutions and practices, and the pluralistic extension system used to disseminate the innovative package. This allowed us to simultaneously address multiple challenges that are inter-linked to bring about meaningful change in farmers' livelihoods and enhance their socio-ecological resilience. ”

Bezalet Dessalegn

iNASHR Project Manager, and
Social Science Specialist, ICARDA



“ The ARC was the cornerstone on which integration amongst partners and all project activities was built. ARC was able to use its extensive institutional structures and capability to disseminate recommended packages and innovative practices across the country to obtain the best productivity and highest return. ”

Dr. Rehab Abdalrhman

Head of Research in Food Legumes Department,
iNASHR Project Coordinator, ARC





“ Engaging local entrepreneurs to disseminate farmer to farmer training videos was key in replicating the project's innovations with marginalized rural women and youth. Mobile smart projectors have demonstrated how technology supports the scaling out of good practices - that are farmer tested and scientifically backed - as a model project for demand driven extension that mends the broken links between rural people and researchers. ”

Laura Tabet

Egypt Country Focal Point, Access Agriculture,
iNASHR Project Coordinator, ARC

“ With the increasing severity of water scarcity in the future and the potential impacts of climate changes in Egypt, iNASHR project introduced a package of irrigation, agronomic, and soil health practices in an integrated manner for enhancing on-farm water use efficiency to thousands of smallholder farmers. ”

Dr. Mohie El Din Omar

Irrigation and Water Management Specialist, ICARDA



Partnering Institutions



- a. **The International Center for Agricultural Research in the Dry Areas (ICARDA)** is the only CGIAR research center headquartered in the non-tropical drylands. Its unique dryland agricultural experience, combined with its extensive networks of research and development partners, including farming communities themselves, well positions it to provide people-centered solutions that are integrated directly into farming activities and food systems.
- b. **Egypt's Agricultural Research Center (ARC)** is the largest organization working on applied agricultural research in the country. The Center was the lead national partner in the iNASHR project and spear-headed the implementation of the project on the ground and across the six governorates using its extensive network of researchers, field technicians, and extension agents.
- c. **Access Agriculture (AA)** is an international non-governmental organization (NGO) with renowned expertise in producing and showcasing farmer-to-farmer (F2F) agricultural training videos and ICT apps in local languages to disseminate innovative technologies to train farmers. AA served as a strategic partner that trained local entrepreneurs and technicians to produce F2F videos, promoted technology transfer, and development of businesses through technology dissemination.
- d. **Tanta Motors** is an Egyptian agricultural machinery manufacturing and trading company which partnered with ICARDA to upgrade the mechanized raised bed machine, originally designed to make raised beds and plant wheat, to also plant faba bean.

The project was funded by the **Federal Ministry for Economic Cooperation and Development (BMZ)**- through the Fund International Agriculture Research (FIA) at GIZ which supports international agricultural research to develop sustainable solutions for crops, aquaculture, and livestock and to bring them into widespread use to improve the livelihoods of smallholder farmers worldwide.

The Challenge



Food insecurity is a growing concern in Egypt. While this is a culmination of a set of complex political, economic, and social conditions; part of the challenge lies in the agricultural sector. Farmers in Egypt struggle with water scarcity, land fragmentation, and increasing costs of production which are further exacerbated by climate variability. While Egyptian wheat production is among the highest in the region, it is not sufficient to meet the growing demand. Increasing wheat productivity through enhanced monocropping practices, and use of improved seed and farming practices have resulted in short-term increases in food security and farmers' income. However, the long-term environmental implications of such intensification can be significant.

The Solution



The iNASHR project aimed to promote sustainable intensification of the wheat-based system in six governorates in Egypt through the promotion of proven agricultural technologies and practices presented below:

- i. **Seeds of improved varieties of wheat and faba bean** that are high yielding, drought tolerant, disease resistant (yellow rust for wheat and *Orobanche* for faba bean), and have good residual retention to be used as livestock feed and for use as organic matter (soil cover/mulching) to improve soil fertility.
- ii. **Raised bed farming** (both mechanized and manual) to reduce water loss; increase crop, water, and fertilizer use efficiency, reduce the demand for seeds and labor, and increases yield (Box 1).
- iii. **Cereal/legume crop rotations** to improve fertility of marginal lands through symbiotic nitrogen fixation, substantially
- reduce demand for chemical N-fertilizer and associated production costs, increase water holding capacity, and conserve the biodiversity of insect pollinators at the system level as it is an entomogamous partially allogamous crop visited by honeybees and wild pollinators.
- iv. **Integrated pest management (IPM)** to reduce dependence on pesticides by promoting alternative pest control techniques and measures that are environmentally friendly and less costly for smallholder farmers.
- v. **Farmer-based seed multiplication** to meet farmers' seed requirements and for wider access to quality seed.

Box 1: Benefits of Using the raised bed (RB) Farming Practice



Saving about 20% of irrigation water compared to the traditional irrigation (flat planting). One of the project activities was to measure the amount of irrigation water in demonstration and neighboring fields to detect the amount of saved water when planting on raised beds.



Raised bed planting allows another option to reduce tillage. Some farmers plant wheat on the same raised beds after harvesting summer crops such as potatoes, tomatoes, peas... etc.



Raised bed planting provides the field access opportunity to mechanically cultivate in the furrows and can be easily combined with chemical control.



Planting on raised beds reduced amount of seeds from 144 kg/ha in the traditional planting to 107 kg/ha on raised bed saving 25% of the used seeds.



Better fertilizer management especially N fertilize to be placed when and where the wheat crop can make more efficient use. Less amount of irrigation water in raised bed plants decreases N fertilizer losses through leaching.



Less lodging incidence due to lower seed rate and reduction in water logging caused by excess water in irrigation in traditional planting.

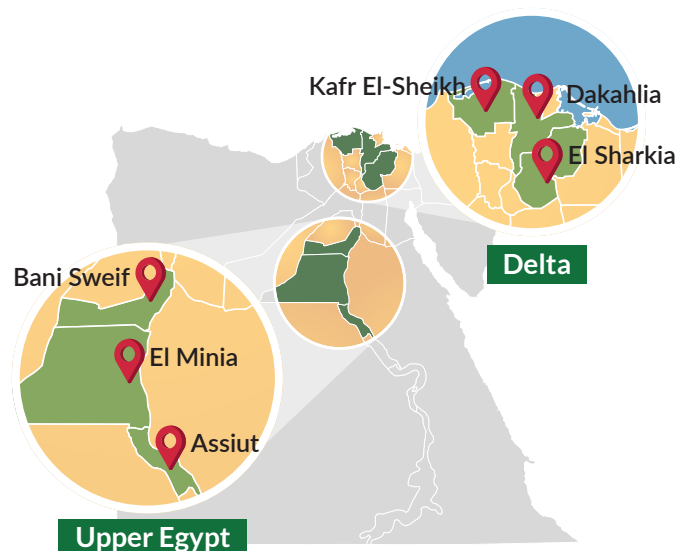


Increases in number of tillers, number of kernels/spike and kernel weight leading to high grain yield.

Geographic Focus



The project operated in six governorates in Egypt including Dakahlia, El Sharkia, and Kafr El-Sheikh in the **Nile Delta**, and Assiut, El Minia, and Bani Sweif in **Upper Egypt**. The latter represents fragile agricultural systems that are based on scarce natural resources, limited access to improved technologies, and access to markets. The Delta, on the other hand, represents the most fertile farmland of the country where wheat production is intensified, and farmers have relatively better access to technologies and markets.



The Approach



The project followed a systemic approach for sustainable intensification of wheat-based farming systems by combining different technologies. When applied as a full package, the technologies resulted in increased crop yields, reduced production costs, increased incomes, and improved availability of fodder. Pluralistic extension systems and multiple participatory strategies including field days, farmer field schools, tailored trainings, farmer-to-farmer videos, extension agents, and private entrepreneurs were used to broaden the project's scope for reaching a diverse group of beneficiaries including women, men, and youth.

The Impact



Over **21,000** farmers reached through field days (**20 % women**)



Over **4,300** farmers reached through Farmer Field Schools (**18% women**)



Close to **240** researchers, extension agents, and technicians trained as trainers (**20% women**)



Close to **58,000** farmers reached through farmer-to-farmer videos (**54% women**)



The project thus directly reached over **80,000** farmers through various dissemination strategies



Close to **50** farmers engaged in seed multiplication (**21% women**)



139,677 farmers from the six governorates adopted at least one of the technologies (**6.51% of all wheat farmers in the six governorates**)



16,351 farmers in the six governorates are not direct project participants and adopted at least one of the technologies (**0.76% of all wheat farmers in the six governorates**)



Total **wheat** area in the six governorates owned by farmers who are not direct project participants and adopted at least one of the technologies was **7,501 ha** (**6.73%**)



Over **400,000** farmers indirectly reached through the project (**if each targeted farmer will pass on lessons learned to at least 5 other farmers**)



Saving about **20%** of irrigation water compared to the traditional irrigation



Planting on raised beds reduced amount of seeds by **40%**



Reduced demand for irrigation water by **20-25%** for wheat and **16-19%** for faba bean



Increased average crop productivity (**20% in wheat and 21% in faba bean**)

Stakeholder Perspectives on Project Success



Men and women farmers, extension agents, and researchers from partnering institutions; and from across the six governorates had a lot to say about the success of the project. Below are some direct quotes that offer insight into the impact of the project. The quotes have been organized to highlight the innovative practice the stakeholder particularly emphasized. But it is important to note that the technologies were offered to the farmers as a package. This is evident in some of the quotes below that speak to various interventions simultaneously.

¹ Ardab is a local measuring unit in Egypt. 1 ardeb of wheat = 150 kg, and 1 ardeb of beans = 160 kg



“ The ICARDA project, iNASHR, began three years ago to support wheat and faba bean farmers. It provided advanced farming methods and basic seeds for free. Farmers implemented the technical recommendations they received from researchers and extension agents and noticed higher productivity compared to neighboring fields. Additionally, neighboring farmers started buying high-quality seeds from them due to their increased productivity. Moreover, farmers started cultivating on RBs and alternating between wheat and faba bean crops. They observed improvements in soil quality and saved on the seeds, irrigation water, and diesel fuel used for irrigation machines. In my opinion, the project successfully convinced farmers, by showing not telling, that the provided guidelines are better for their land and productivity. They fully embraced and committed to these recommendations even after the project's completion. ”

Eng. Ahmed Mahmoud Ahmed Gad
General Manager of Agricultural Extension in Dakahlia Governorate



“ At the beginning of the project, the scientific team provided participating farmers with videos, photos, and lectures illustrating the potential obstacles they might face during faba bean cultivation and ways to overcome them. Farmers received improved seeds and welcomed them enthusiastically. The seeds enhanced their productivity, increasing yields from an average of 10 ardebs to 15 ardebs per acre in the first season. They also saved on agricultural inputs, such as water for irrigation, fertilizers, and irrigation machine operation time, by cultivating on RBs. The governorate's faba bean cultivation area increased from 9,000 to an estimate of 14,500 acres. ”

Dr. Waleed Mohamed
Scientific Supervisor in Dakahlia Governorate

Yield Gains (improved variety seeds):

“ We have introduced Orobanche-tolerant varieties like Sakha 4 and Sakha 5, which were not commonly used but have now gained popularity. Farmers are now specifically requesting these varieties, demonstrating their increased awareness and knowledge about different seed options. ”

Dr. Ismail Abu Bakr ElSeddik
Faba Bean, Sharkiya (Researcher)



“ We have successfully reached farmers and provided them with accurate technical recommendations regarding cultivation methods, seed selection, irrigation, harvest timing, disease resistance, and weed control. As a result, productivity has increased, and we have witnessed a significant difference compared to the national average. While the average yield in demonstration fields is 19.2 ardabs, our approach has enabled some farmers to achieve 24 ardabs. This success has allowed us to expand our reach and work with a larger number of farmers, fulfilling our research goals. ”

Eng. Manal Abdelsamad Hassan
Wheat, Sharkiya (Extension Agent)



“ The project provided us with complimentary bean seeds, resulting in significantly higher yields. Previously, we would only cultivate one or two fields, but now we have expanded our operations to encompass 3-4 fields. ”

Hemdan Hameed Mohamed
Beni Mazar, Minya (Farmer)



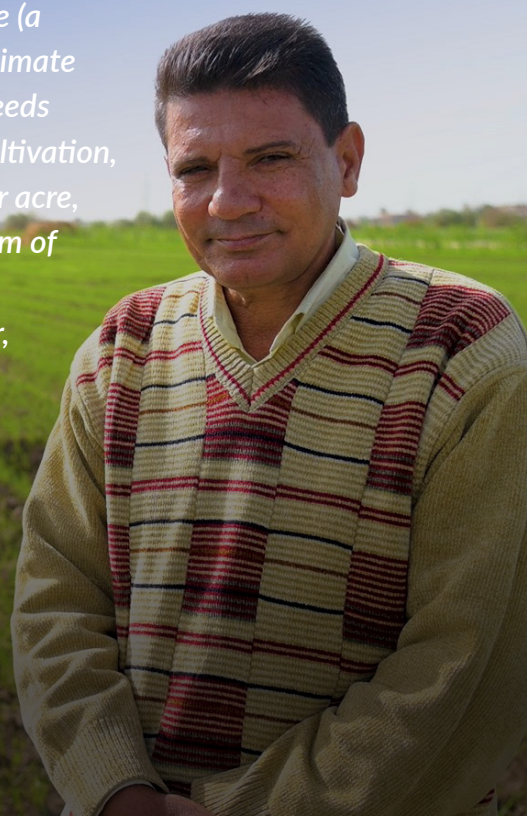
“ We received the basic seeds for faba beans from the project, and we found that their quality is higher than the seeds we used to use. Faba bean cultivation was not widespread in the village. We were only about 5-6 farmers growing it, but now we have more than 150 farmers because our neighbors noticed that faba beans have an excellent return. They started asking us and we taught them how to cultivate faba beans correctly, just as we learned from the project. In addition, most of the faba beans that were harvested in my field last year were sold as seeds. ”

El Sayed Hassan Hassan Al-Basyouni
Mansoura/Dakahliya (Farmer)

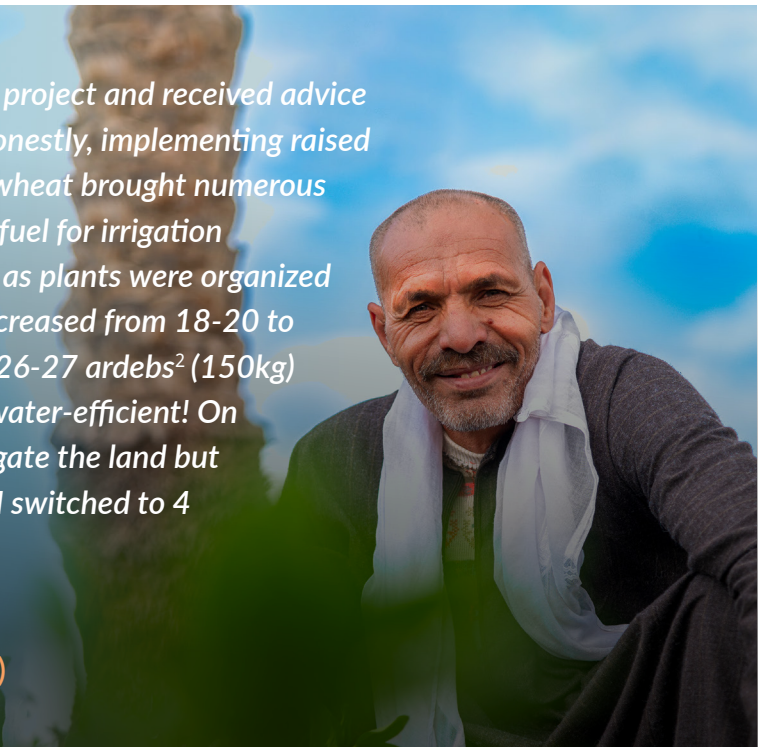


“ In Assiut, bean crops were susceptible to Orobanche (a disease) due to the rising temperatures caused by climate change. However, thanks to the disease-resistant seeds provided by the project, in addition to raised bed cultivation, farmers now achieve bean yields of 15-16 ardab per acre, compared to the previous 7-8 ardab. The root system of beans has the remarkable ability to convert atmospheric nitrogen into organic nitrogen fertilizer, enriching the soil. So only 15 units of nitrogen fertilizer are required as a starter dose. This natural process reduces the need for additional nitrogen fertilizer by 45 kg per acre, as previously an acre required 60 kg of nitrogen fertilizer. ”

Dr. Gamal Abdelaziz
Legumes, Assiut (Researcher)



Raised bed farming (saving water, seeds, labor, increasing yield, reducing production costs):



“ Three years ago, I joined ICARDA's project and received advice to try new farming methods and honestly, implementing raised beds for planting faba beans, and wheat brought numerous benefits. I saved seeds, water, and fuel for irrigation machines. Weeding became easier as plants were organized on the beds. My faba bean yield increased from 18-20 to 20-25, and wheat, from 20-25 to 26-27 ardebs² (150kg) per acre. This method is also very water-efficient! On regular beds, it took 3 hours to irrigate the land but now it only takes 2 hours because I switched to 4 raised beds. ”

Mohamed Soliman
Sultan Village, Beni Sueif (Farmer)



“ the raised beds minimize wastage of seeds, water, and fertilizers, resulting in increased production rates of around 20-25 %. ”

Abdelaziz Aly Mohamed
Qommosh Al-Hamraa Village, Beni Sueif (Farmer)



“ Adopting RB farming practices has significantly reduced wastage, leading to savings in seeds, water, and fertilizers. This approach has empowered us to manage our lands more efficiently, ultimately enhancing crop yields and resulting in tangible benefits for our farm. ”

Ahmed Sayed Hafiza
Beni Sueif (Farmer)

² Ardab/ardeb is a local measuring unit in Egypt. 1 ardeb of wheat = 150 kg, and 1 ardeb of beans = 160 kg

“ As women, we actively contribute to the fields by weeding, seeding, and fertilizing by hand. Transitioning to raised beds significantly reduced our efforts and the need for additional labor. The land now requires fewer seeds and fertilizers, and flooding is minimized, leading to fewer weeds. Consequently, we have reduced expenses while achieving higher yields. This improvement allows us to allocate funds more conveniently for other needs and desires. ”

Om Mahmoud
Beni Sueif (Farmer)



“ A notable benefit is the increased water efficiency. Previously, irrigating an acre took two hours, but with the raised beds, it not only requires one hour. This not only saves water but also reduces electricity consumption. ”

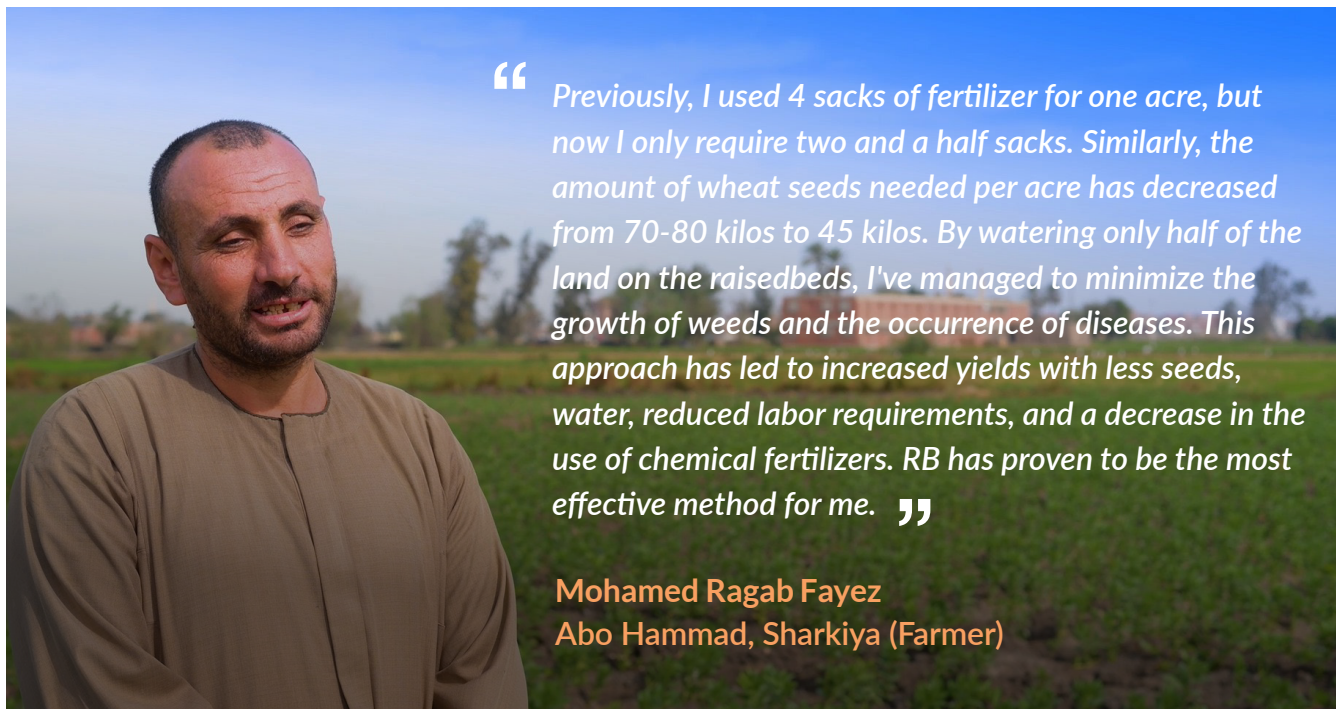
Ahmed Abdelhamid
Assiut (Farmer)



“ I've managed to achieve the same or even better crop yields with significantly less water consumption. By implementing crop rotation and utilizing raised beds created with the RBM (Raised Bed Machine), I've been able to plant two acres with the same amount of water that used to be allocated for just one acre. This shift has also resulted in fuel savings, as the irrigation machine now operates for only 3 or 2 hours instead of the previous 5 hours. ”

Gamal Attia
Abo Hammad, Sharkiya (Farmer)





“ Previously, I used 4 sacks of fertilizer for one acre, but now I only require two and a half sacks. Similarly, the amount of wheat seeds needed per acre has decreased from 70-80 kilos to 45 kilos. By watering only half of the land on the raisedbeds, I've managed to minimize the growth of weeds and the occurrence of diseases. This approach has led to increased yields with less seeds, water, reduced labor requirements, and a decrease in the use of chemical fertilizers. RB has proven to be the most effective method for me. ”

Mohamed Ragab Fayed
Abo Hammad, Sharkiya (Farmer)



“ The adoption of raisedbeds has not only reduced weed growth but also resulted in significant labor savings. Previously, I needed 10 workers for weeding, which was costly. However, now I only require five workers. Additionally, I've saved on seed and irrigation expenses. ”

Soheir Mohamed Samir
Abo Hammad, Sharkiya (Farmer)



“ RB farming stands out as the most effective agricultural method. It reduces water usage by 50 % through the channeling of water through furrows over shorter distances, saving approximately 3200 meters. Moreover, it allows for more efficient use of fertilizers. Instead of 3-4 bags, I now use only one bag due to adequate nutrient concentration in the soil. RB farming also helps reduce weed density as weeds grow in proportion to the water they receive. As we benefited from RB farming, our neighboring farmers became curious about our methods. We willingly shared our knowledge and witnessed a 50 % increase on RB farms in the area. ”

Ashour Mohamed Sadek
Sheikh Fadl Village, Beni Mazar, Minya (Farmer)

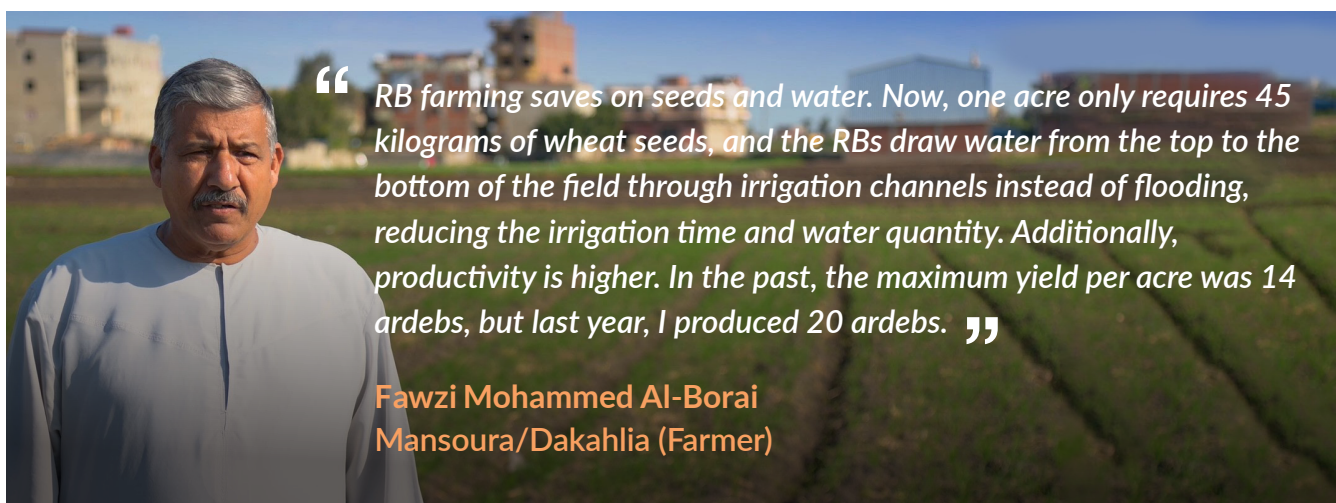
“ We have acquired valuable knowledge on how to cultivate crops on RBs, ensuring proper irrigation and labor management. The wheat yield per acre, which previously ranged from 12 to 15, has now reached 25 to 27 ardabs³ with room for further improvement. We hope to continue this project as it brings us significant benefits, such as allowing us to cultivate three or four fields instead of just one or two. The time required per acre has also decreased from 12-15 hours to just 6-8 hours with our available labor. Irrigation duration has also decreased from 5-6 hours to 2-2.5 hours. After adopting the recommended methods, our neighbors eagerly embraced it and started implementing RB farming across the entire region. They now cultivate all their crops, both in summer and winter, on these elevated platforms. The introduction of RBs has proven to be extremely advantageous for us. ”

Hemdan Hameed Mohamed
Beni Mazar, Minya (Farmer)



“ RB farming saves on seeds and water. Now, one acre only requires 45 kilograms of wheat seeds, and the RBs draw water from the top to the bottom of the field through irrigation channels instead of flooding, reducing the irrigation time and water quantity. Additionally, productivity is higher. In the past, the maximum yield per acre was 14 ardebs, but last year, I produced 20 ardebs. ”

Fawzi Mohammed Al-Borai
Mansoura/Dakahlia (Farmer)



³ Ardab/ardeb is a local measuring unit in Egypt. 1 ardeb of wheat = 150 kg, and 1 ardeb of beans = 160 kg

“ It turned out that we didn't know anything about agriculture even though we are farmers. Through the agricultural extension project providing excellent wheat seeds, we planted, and the crop began to produce perfectly, especially when we planted on RB and began to introduce the people around us to what we had learned. RB farming has proven invaluable, providing efficient irrigation, labor, and chemical fertilizer usage. Previously, we required 15 workers per acre, but now we only need 8. During harvest, 20 workers were necessary, but now we manage with 12-13 workers. ”

Ragab Saad Abdelwahab
Beni Mazar, Minya (Farmer)



“ Cultivating wheat on RBs is better for two reasons. First, water! I used to irrigate the acre with the irrigation machine in 3 hours, but now the process is completed in only one hour. Second, I saved on the amount of seeds used. We were used to consuming large quantities of seeds, but I tried to adhere to the instructions and use only 45 kilograms of seeds per acre of wheat, and the result was astonishing! Within a month to a month and a half, you won't be able to see the ground due to the density of the crop. Every month, someone from the agricultural extension comes to follow up on the crop with me and provides me with the new information/support I need. In the beginning of the year, my neighbors used to mock me, but now they imitate me! ”

Sabri Mahmoud Al-Sebai
Mansoura/Dakahlia (Farmer)





“ Prior to adopting RB farming, we relied on traditional cultivation methods. On average, an acre of wheat would yield 7-8 ardab. However, after transitioning to RBs, the same acre produced an impressive 25-27 ardab last year. Moreover, while an acre previously required 5 to 6 workers, it now only requires 2 workers. RB farming has proven to be a more efficient and labor-saving approach for cultivating all our crops, as it conserves water and reduces weed growth. I highly recommend that all farmers embrace RB farming and incorporate crop rotation into their practices. Try alternating between wheat and beans for a year, and you will witness the positive impact it has. ”

Alaa Mohamed Ali
Assiut (Farmer)

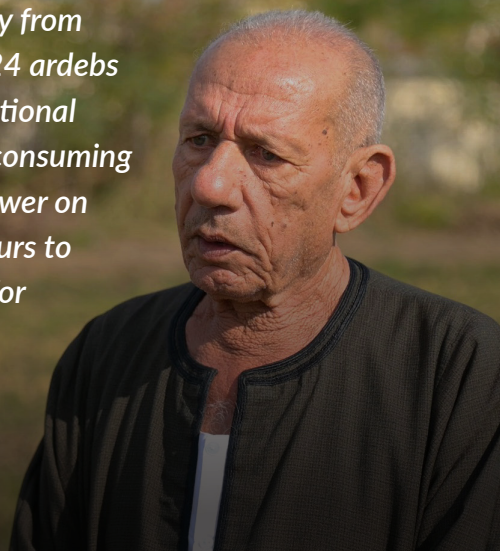


“ This is my third year as a participant in the project. RB has several benefits, but the most important for me is that they enable me to have more control over my field. If there is a bed that needs water and another that doesn't, I can control the irrigation water quantity. Also, there is very little labor in our area, but since the weeds have decreased significantly, women now help us in the field due to the ease of the task. Their small size allows them to go down between the RBs to weed without damaging the crops. ”

El Sayed Hassan Hassan Al-Basyouni
Mansoura/Dakahliya (Farmer)

“ Wheat cultivation on RBs has increased its productivity from 14-15 ardebs to 18-21 ardebs, and it can exceed 23-24 ardebs with proper care. It also saves water compared to traditional farming, which required multiple flooding of the land, consuming additional fuel. The cost and water consumption are lower on RBs, as the irrigation time has been reduced from 5 hours to 1.5 hours. Crop rotation improves productivity levels, for both the faba beans and wheat. ”

Mostafa
Kafr ElSheikh (Farmer)



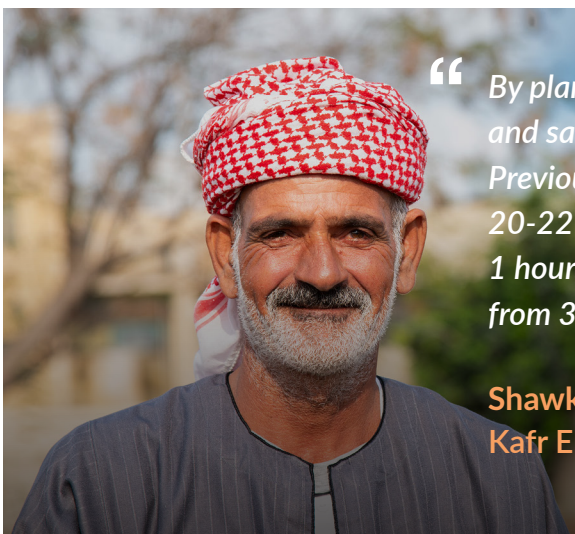
“ RB farming requires smart farmers who listen carefully, understand recommendations, and implement them effectively to achieve the highest productivity. Regarding faba beans, the advice we received was excellent. We had never cultivated in this way before, but by planting at the right time and using proper techniques with the received seeds, we produced 13 ardebs of faba beans, with less than 4 stalks affected by disease. ”

Shahenda Ali Abdelfattah
Kafr ElSheikh (Farmer)



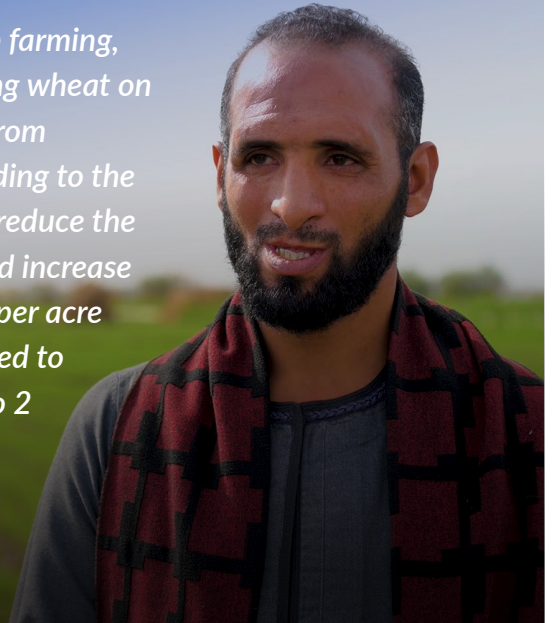
“ By planting wheat on RBs, we achieved higher productivity and saved water, time, fuel, and chemical fertilizers. Previously, one acre produced 16-17 ardebs, but now it yields 20-22 ardebs. The irrigation time decreased from 2 hours to 1 hour, and the number of required sacks of seeds decreased from 3 to only 2. ”

Shawki Mohammed Al-Magharbi
Kafr ElSheikh (Farmer)



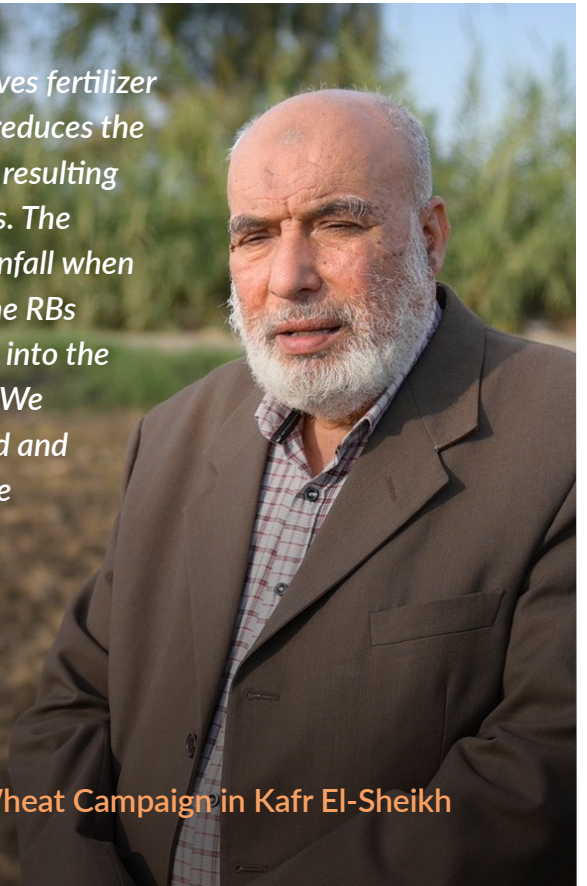
“ I am a participant in the digital guidance for RB crop farming, following their instructions on farming and harvesting wheat on RBs. We plow the land, build the RBs, obtain seeds from agricultural researchers, and prepare the land according to the instructions. RBs allow sunlight to reach the wheat, reduce the need for chemical fertilizers, irrigation, and labor, and increase productivity. In the past two years, the productivity per acre increased from 15-18 to 20-22 ardebs. Irrigation used to take 4 hours by flooding, but now it only takes 1.5 to 2 hours, and I don't flood anymore. ”

Nagi Khalil
Assiut (Farmer)



“ RB farming saves fuel and irrigation water, improves fertilizer efficiency due to better water management, and reduces the likelihood of diseases, especially powdery mildew resulting from high densities that were reduced by the lines. The benefits of RB farming became apparent after rainfall when traditionally cultivated fields were flooded, but the RBs remained intact because the excess water flowed into the lines, and there were no issues with germination. We estimated the crop yield during the harvest period and witnessed a noticeable increase in production. We hope to provide easily transportable RB farming machinery to support farmers. It's worth noting that neighboring farmers have also adopted RB farming. ”

Dr. Saeed Mohammed Hammad
Wheat Researcher and Head of the National Wheat Campaign in Kafr El-Sheikh

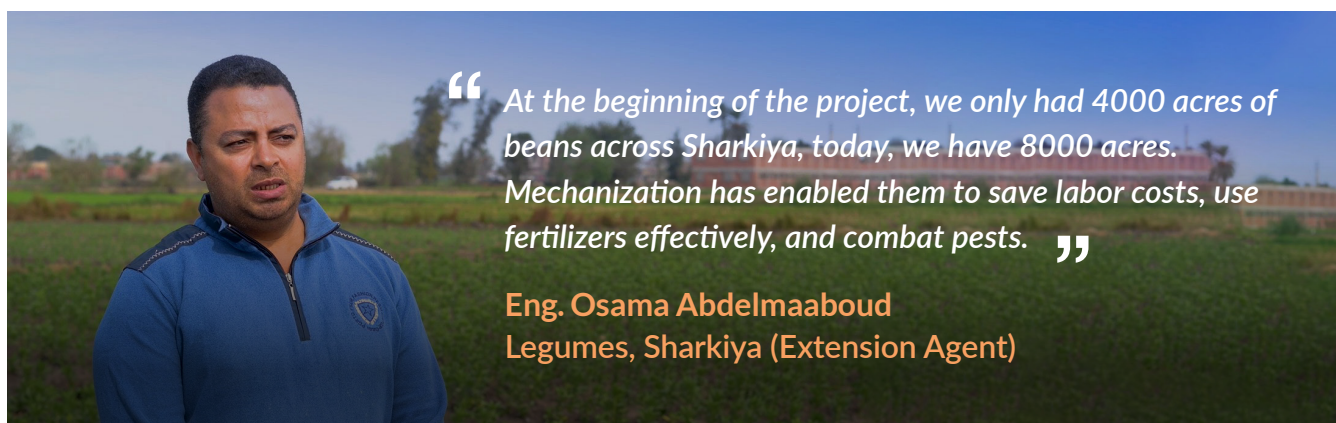


Yield Gains (improved variety seeds):



“ Before ICARDA's project, farmers in our area were practicing primitive cultivation methods. However, by introducing modern techniques such as raised beds, we witnessed a significant turnout and yield gains, especially with the introduction of pest and disease-resistant seed varieties. Water consumption decreased as well, with irrigation time shortened from three hours to two or even one and a half hours. ”

**Eng. Selim Mohamed Mohamed
Biba, Beni Suef (Extension Agent)**



“ At the beginning of the project, we only had 4000 acres of beans across Sharkiya, today, we have 8000 acres. Mechanization has enabled them to save labor costs, use fertilizers effectively, and combat pests. ”

**Eng. Osama Abdelmaaboud
Legumes, Sharkiya (Extension Agent)**



“ The iNASHR packages resulted in a 30 % reduction in seed costs per farmer. Raised bed farming has significantly reduced irrigation time, with the need for only 2 hours or an hour and a half compared to the previous 4 hours per acre. Fertilizer efficiency has also increased, as farmers now require only 3 sacks of nitrogen fertilizer instead of the previous 4-5 sacks. ”

**Eng. Walid Kamal
Wheat, Sharkiya (Extension Agent)**

“ In Assiut, we cultivate an annual wheat area ranging from 160,000 to 200,000 feddans, consuming a significant amount of water. This water consumption can be redirected towards the reclamation of desert lands, offering opportunities for sustainable agricultural expansion. I actively participated in the ICARDA project for three consecutive years, focusing on teaching farmers the benefits of RB farming for wheat cultivation. The advantages extend beyond water conservation, including reduced seed requirements by 25 % per acre, a 25 % decrease in water usage during the planting season, improved efficiency in nitrogen fertilizer consumption through crop rotation, minimized fertilizer runoff, reduced wheat crop dormancy during windy periods, and increased productivity by 4-5 ardab per acre. ”

Dr. Mahmoud Mohamed
Wheat, Assiut (Researcher)



Crop Rotation (reduced demand for fertilizers, improved soil fertility)

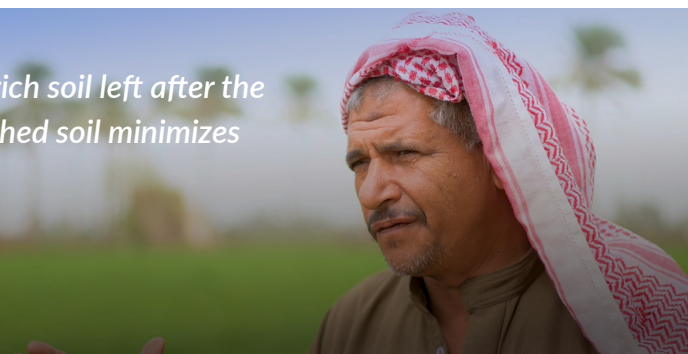
“ Diversifying crops has proven beneficial for soil health. After harvesting, the soil remains dark, moist, and spongy, without the usual fungal residue from planting the same crop repeatedly. Breaks between cereal crops with faba beans saved both my land and money. The nitrogen left in the soil by faba beans prepares it for the next cereal crop, reducing the need for fertilizers. As a result, when I plant wheat in the following season, the land becomes more productive, providing better value for money. ”

Abdelaziz Aly Mohamed
Qommosh Al-Hamraa Village, Beni Sueif (Farmer)



“ Faba bean crops leave behind a nutrient-rich soil left after the harvest. Opting to sow wheat in this enriched soil minimizes spending on fertilizers. ”

Ahmed Sayed Hafiza
Beni Sueif (Farmer)



“ Previously, I focused on growing wheat and rice, but the soil quality deteriorated, affecting the productivity of the crops and impacting both my own farming economy and the country's economy. However, two years ago, I was introduced to the idea of cultivating beans, and when I started planting them, I observed a remarkable improvement in soil quality. ”

Samy Abdelrahman
Abo Hammad, Sharkiya (Farmer)



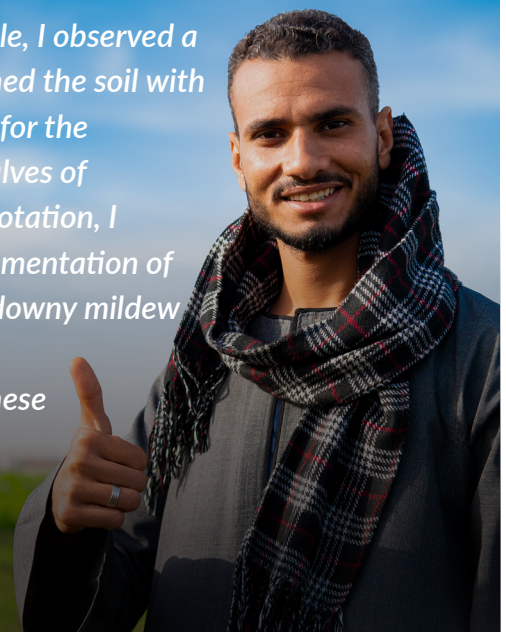
“ We recognized that continuous wheat cultivation depletes the soil's nutrients. Consequently, the project introduced crop rotation as a solution, allowing the soil to rest between wheat crops and be replenished by nutrient-rich crops like beans. This practice has significantly improved the quality and productivity of subsequent wheat crops, leading to increased income. ”

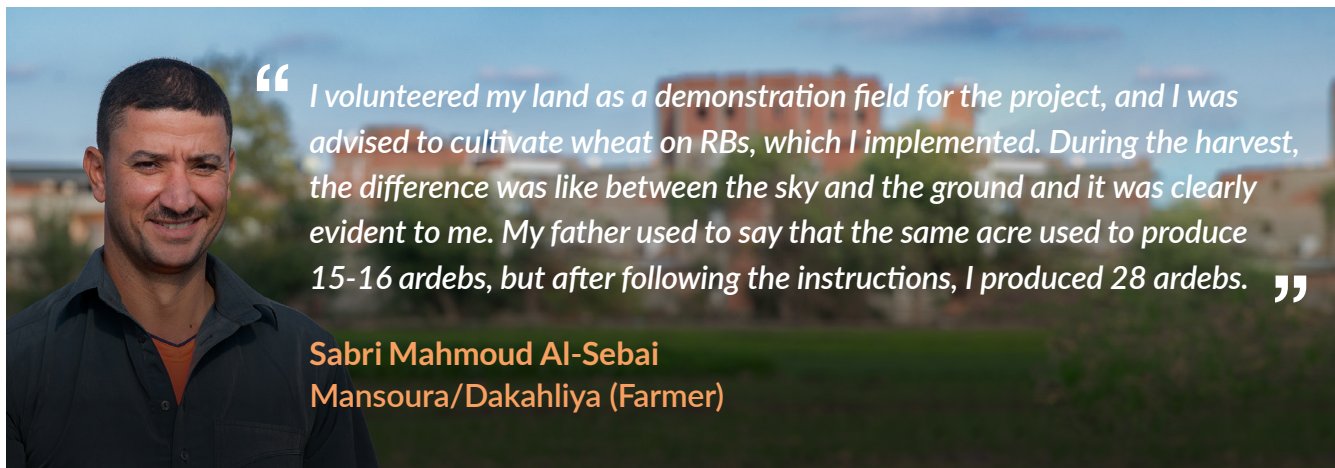
Om Ziad
Assiut (Farmer)



“ When I planted beans followed by wheat in the next cycle, I observed a significant reduction in fertilizer usage. The beans enriched the soil with nutrients, resulting in a decreased fertilizer requirement for the subsequent wheat crop. Previously, I would provide 3 halves of chemical fertilizer per acre of wheat, but after the crop rotation, I found that only 2 halves were necessary. With the implementation of crop rotation, we successfully addressed issues such as downy mildew and soil diseases that had previously plagued our wheat cultivation. The rotation strategy effectively managed these problems. ”

Ahmed Abdelhamid
Assiut (Farmer)





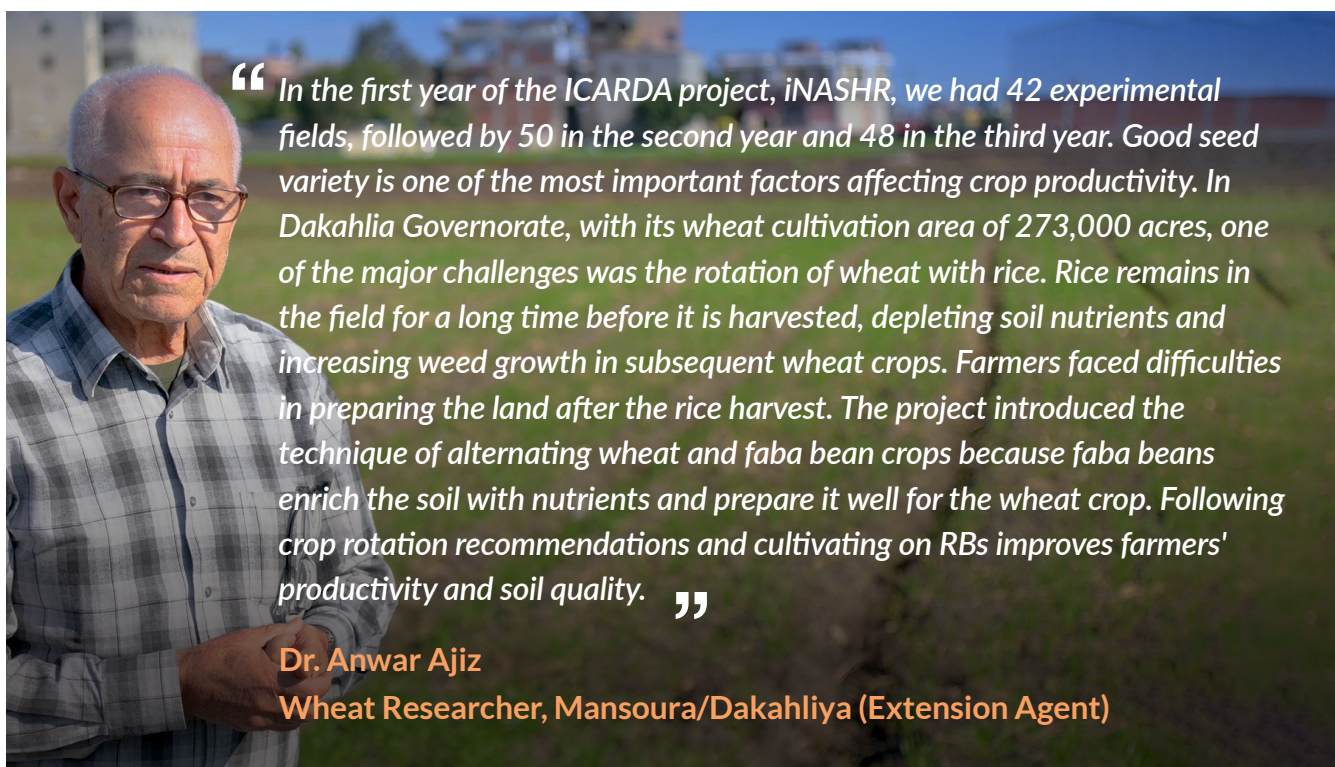
“ I volunteered my land as a demonstration field for the project, and I was advised to cultivate wheat on RBs, which I implemented. During the harvest, the difference was like between the sky and the ground and it was clearly evident to me. My father used to say that the same acre used to produce 15-16 ardebs, but after following the instructions, I produced 28 ardebs. ”

Sabri Mahmoud Al-Sebai
Mansoura/Dakahliya (Farmer)



“ ICARDA revived the crop rotation that had been completely forgotten recently among farmers, reintroducing the cultivation of local faba beans, which had seen a significant decrease in cultivation areas in Egypt due to its susceptibility to diseases and weeds such as Orobanch. However, through the introduction of a new agricultural technique for farmers, which is RB farming, along with precise recommendations on how to implement it in terms of precise beds measurements and cultivation methods, helped overcome the diseases mentioned earlier, in addition to saving on seeds and irrigation water. ”

Eng. Manal Mohamed Kamel
Sharkia (Extension Agent)



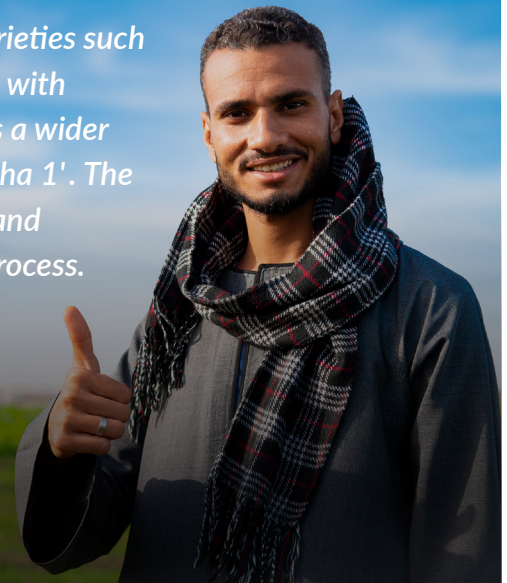
“ In the first year of the ICARDA project, iNASHR, we had 42 experimental fields, followed by 50 in the second year and 48 in the third year. Good seed variety is one of the most important factors affecting crop productivity. In Dakahlia Governorate, with its wheat cultivation area of 273,000 acres, one of the major challenges was the rotation of wheat with rice. Rice remains in the field for a long time before it is harvested, depleting soil nutrients and increasing weed growth in subsequent wheat crops. Farmers faced difficulties in preparing the land after the rice harvest. The project introduced the technique of alternating wheat and faba bean crops because faba beans enrich the soil with nutrients and prepare it well for the wheat crop. Following crop rotation recommendations and cultivating on RBs improves farmers' productivity and soil quality. ”

Dr. Anwar Ajiz
Wheat Researcher, Mansoura/Dakahliya (Extension Agent)

Integrated Pest Management

“Through the project, we were introduced to new seed varieties such as 'Giza 843', 'Giza 716', and 'Misr 3'. The collaboration with ICARDA allowed us to expand our knowledge and access a wider range of seed options beyond the previously known 'Sakha 1'. The project facilitated continuous support from researchers and extension workers who closely supervised the planting process. They provided invaluable guidance on weed and pest management, ensuring optimal practices from the initial stages until harvest.”

Ahmed Abdelhamid
Assiut (Farmer)



“In collaboration with ICARDA, we have conducted field schools and seminars for farmers, providing guidance and support throughout the season. We educate farmers on fungal and insect control measures, enabling them to achieve higher returns with lower costs per unit area.”

Dr. Ismail Abu Bakr ElSeddik
Faba Bean, Sharkiya (Researcher)

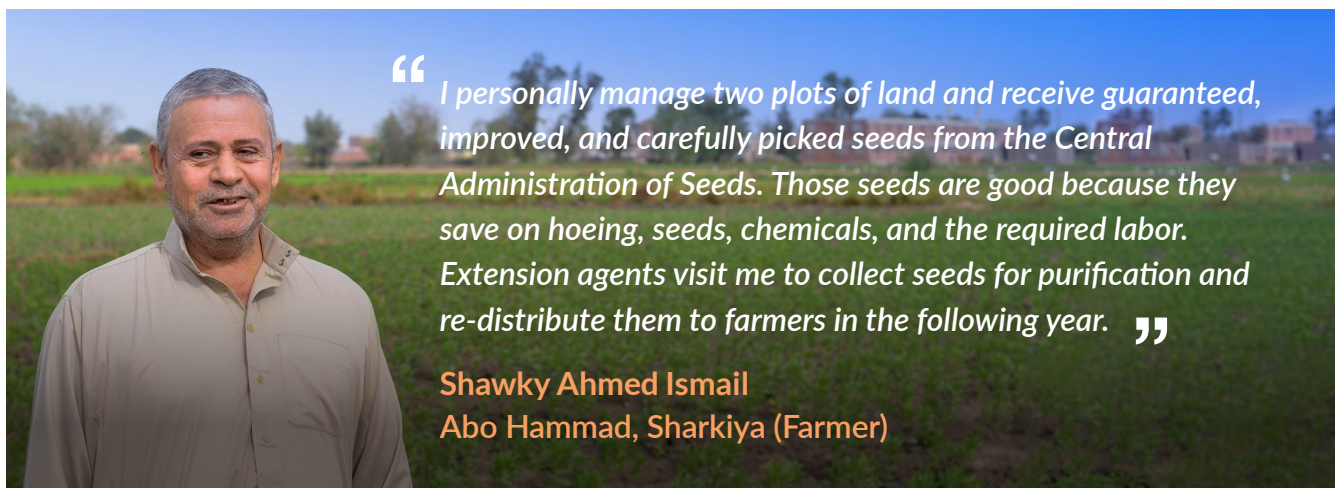


Seed Multiplication

“Seed multiplication enabled us to exchange guaranteed sacks with neighboring farmers, eliminating the need to purchase expensive and unreliable seeds.”

Mohamed Soliman
Sultan Village, Beni Suef (Farmer)

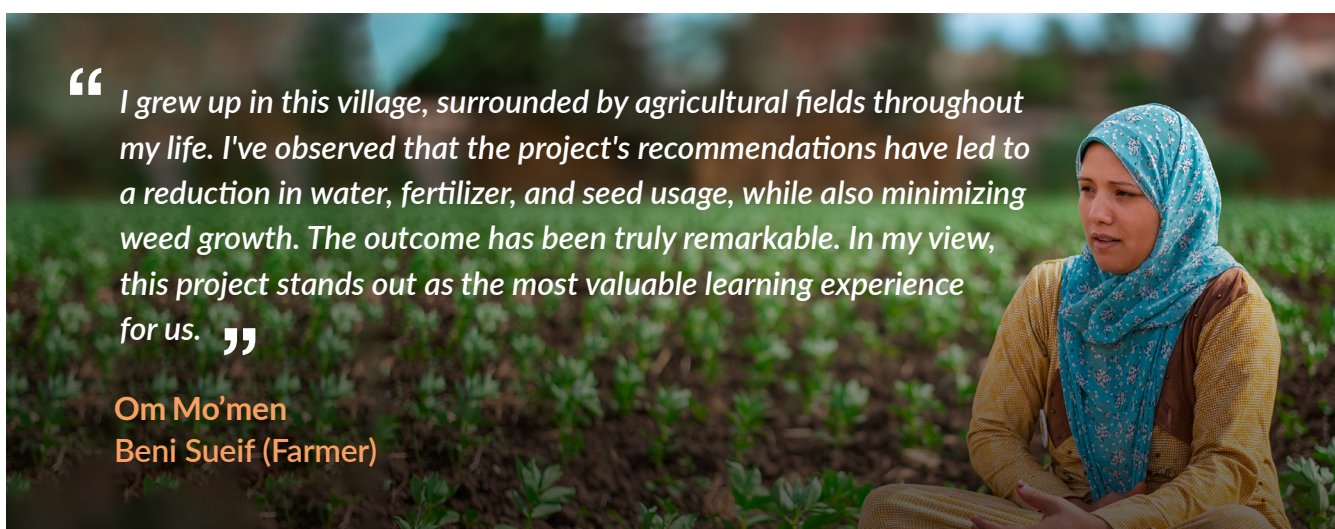




“ I personally manage two plots of land and receive guaranteed, improved, and carefully picked seeds from the Central Administration of Seeds. Those seeds are good because they save on hoeing, seeds, chemicals, and the required labor. Extension agents visit me to collect seeds for purification and re-distribute them to farmers in the following year. ”

Shawky Ahmed Ismail
Abo Hammad, Sharkiya (Farmer)

Capacity building/general awareness/methodological approach



“ I grew up in this village, surrounded by agricultural fields throughout my life. I've observed that the project's recommendations have led to a reduction in water, fertilizer, and seed usage, while also minimizing weed growth. The outcome has been truly remarkable. In my view, this project stands out as the most valuable learning experience for us. ”

Om Mo'men
Beni Sueif (Farmer)



“ Through the iNASHR project, we established field schools to provide practical technical information directly to small farmers. By witnessing successful experiences in pilot fields and engaging in information exchange, farmers corrected inherited traditions and embraced new techniques that guarantee high productivity. We also taught them how to assess their fields, identify issues, and address them effectively. These activities propelled farmers to a higher technical level and increased productivity, reflecting a significant leap in their livelihoods. ”

Eng. Kirollos George
Biba, Beni Sueif (Extension Agent)



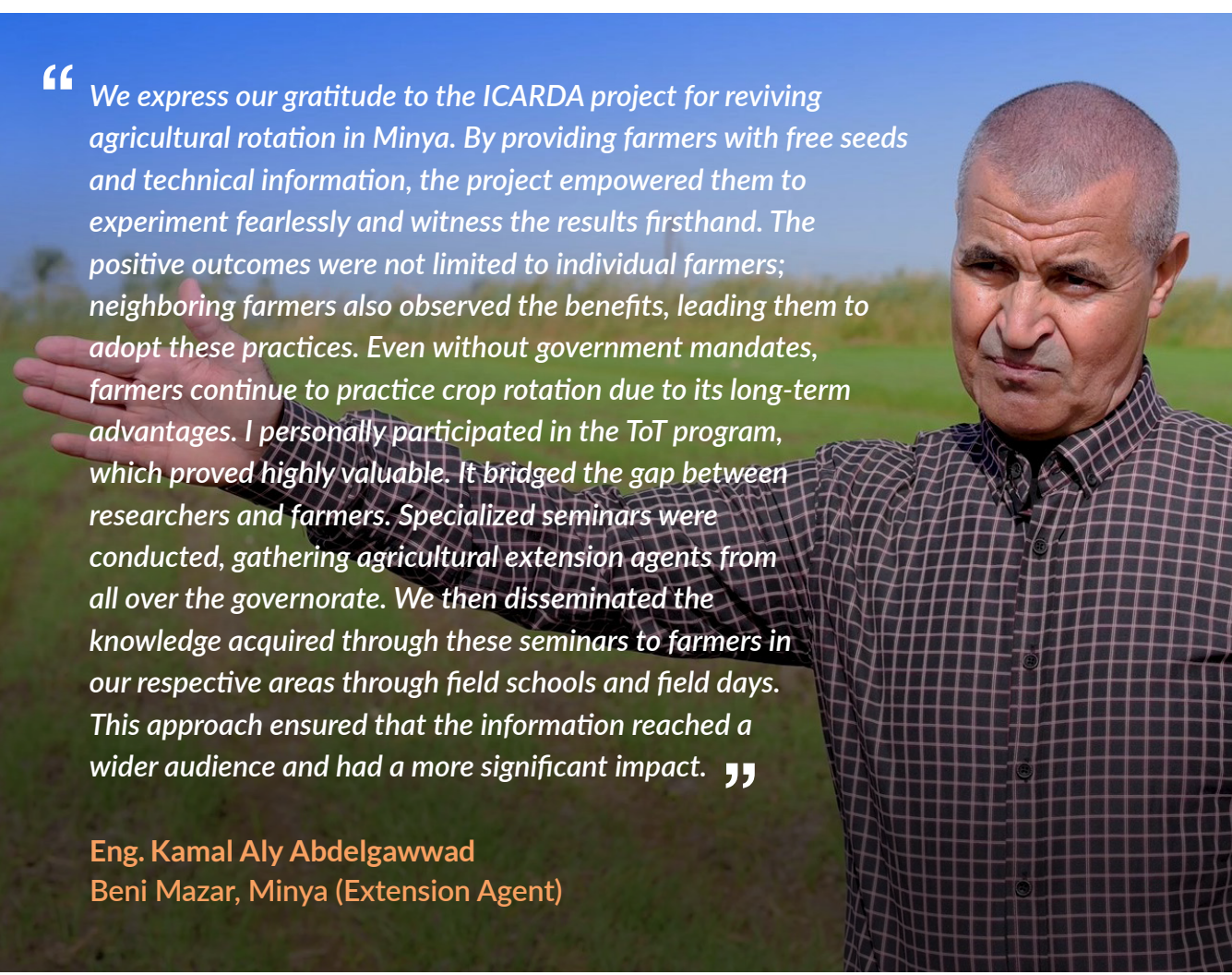
“ I discovered new avenues for developing my extension work through my participation in ICARDA's ToT program. This experience facilitated direct engagement with research centers, enhancing the communication skills of agricultural extension agents prior to fieldwork with farmers. Moreover, it enabled us to reach previously inaccessible agricultural communities. Additionally, the program introduced us to modern techniques such as agricultural mechanization and RB farming, all of which contribute to agricultural development and align with the Ministry of Agriculture's strategy. ”

Eng. Asrar Mohamed
Beni Sueif (Extension Agent)



“ We were alongside the farmers every step of the way during the project. Through the demonstration fields, farmers witnessed tangible results which strengthened their conviction and commitment to the project's recommendations. Despite the project concluding, I can confidently assert that at least around 70-75 % of the farmers we assisted here in Beni Sueif will stick to the recommendations. ”

Eng. Amira
Beni Sueif (Extension Agent)

A photograph of Eng. Kamal Aly Abdelgawwad, an older man with short grey hair, wearing a dark checkered button-down shirt. He is standing in a green field under a clear blue sky, gesturing with his right hand towards the left.

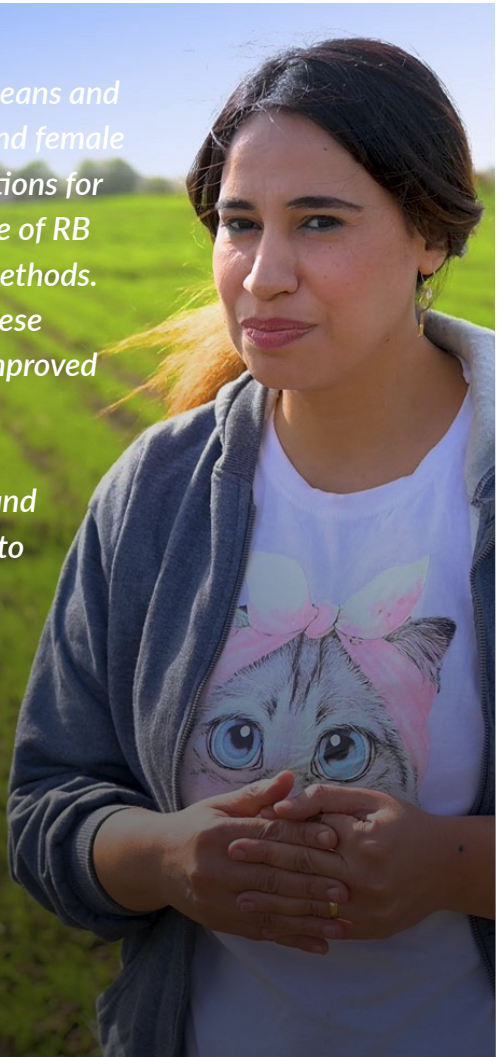
“ We express our gratitude to the ICARDA project for reviving agricultural rotation in Minya. By providing farmers with free seeds and technical information, the project empowered them to experiment fearlessly and witness the results firsthand. The positive outcomes were not limited to individual farmers; neighboring farmers also observed the benefits, leading them to adopt these practices. Even without government mandates, farmers continue to practice crop rotation due to its long-term advantages. I personally participated in the ToT program, which proved highly valuable. It bridged the gap between researchers and farmers. Specialized seminars were conducted, gathering agricultural extension agents from all over the governorate. We then disseminated the knowledge acquired through these seminars to farmers in our respective areas through field schools and field days. This approach ensured that the information reached a wider audience and had a more significant impact. ”

Eng. Kamal Aly Abdelgawwad
Beni Mazar, Minya (Extension Agent)

A photograph of Eng. Hamdy Mohamed Khalil, a man with a mustache and short grey hair, wearing a light blue button-down shirt. He is standing in a green field under a clear blue sky, looking slightly to the left.

“ Over a span of 3 years, in partnership with ICARDA and the Agricultural Research Center, we conducted seminars, field visits, and field schools for a group of farmers. These sessions provided technical recommendations covering various aspects of agriculture, from planting to harvest. The comprehensive packages included RB farming, weed management, balanced fertilization, moderate irrigation, and the rotation of wheat and bean crops to minimize soil stress. We are beginning to witness tangible returns for farmers. Some farmers have achieved wheat crops of 24 ardab, compared to the previous average of 18 ardab. This increase in productivity has positively impacted farmers' incomes and improved their standard of living. ”

Eng. Hamdy Mohamed Khalil
Head of Agricultural Extension, Assiut



“ I collaborated with ICARDA to promote the rotation of beans and wheat crops through field schools involving both male and female farmers. We provided them with technical recommendations for wheat and bean cultivation, emphasizing the importance of RB farming, proper fertilization techniques, and irrigation methods. Farmers quickly realized the benefits of implementing these recommendations, leading to reduced seed usage and improved yields. To ensure comprehensive training, we divided the program into theoretical and practical components. The theoretical part covered precise fertilization, irrigation, and seed rates, while the practical segment allowed farmers to apply these recommendations in their own fields. This hands-on approach attracted neighboring farmers, and we now have rural leaders in each village who share their knowledge of rotation and RB farming with their peers. This dual training approach was not widespread before the project's inception. ”

Eng. Louisa Abdelnour
Assiut (Extension Agent)



“ What encourages farmers to adopt new farming techniques and other extension recommendations is the opportunity to witness successful experiences firsthand. For instance, pilot fields where project recommendations were applied convinced farmers to adopt the packages. Moreover, farmers learn from each other through informal communication, amplifying the spread of recommendations. As researchers, we also gather valuable insights from farmers while conducting experiments. This mutual exchange of knowledge fosters trust and accelerates the acceptance of beneficial information. ”

Dr. Hend Ghannam
Legumes Researcher, ARC



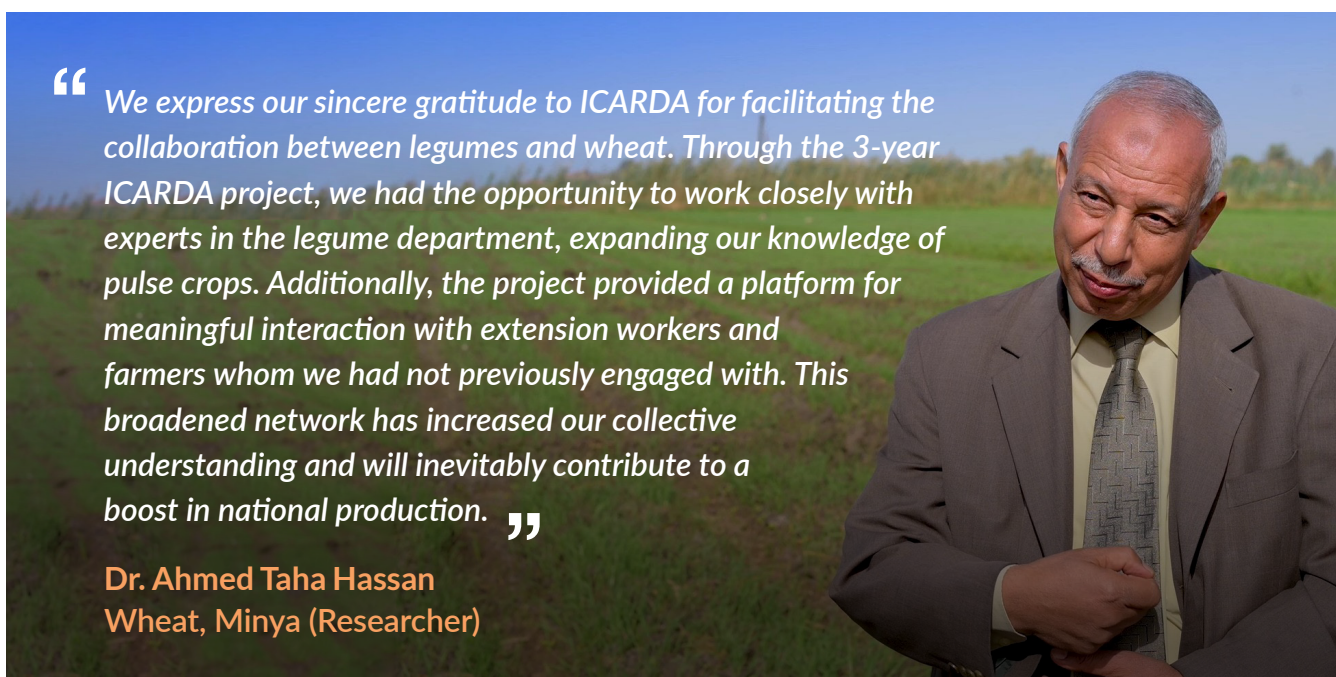
“ Our data collection revealed that farmers previously practiced unguided agriculture, leading to inefficient water, fertilizer, seed, and labor utilization. The average farmer used to spend 2000 EGP on an acre, now he spends around 1000 EGP. Wheat crop rotation with legumes also enhanced soil fertility, allowing better water and fertilizer absorption for deeper root growth. Even after the project's completion, farmers continued to adopt these practices due to increased income and the ongoing benefits they provide. ”

Dr. Ahmed Mansour
Researcher, ARC



“ We have implemented various strategies to disseminate information and educate farmers through seminars, field schools, and extension agents who act as intermediaries between researchers and farmers. We have also organized field school programs and field days to deliver valuable information to farmers, ensuring they understand and implement the recommendations, which ultimately leads to positive outcomes. ”

Dr. Manal Abdelsamad Hassan
Wheat, Sharkiya (Researcher)



“ We express our sincere gratitude to ICARDA for facilitating the collaboration between legumes and wheat. Through the 3-year ICARDA project, we had the opportunity to work closely with experts in the legume department, expanding our knowledge of pulse crops. Additionally, the project provided a platform for meaningful interaction with extension workers and farmers whom we had not previously engaged with. This broadened network has increased our collective understanding and will inevitably contribute to a boost in national production. ”

Dr. Ahmed Taha Hassan
Wheat, Minya (Researcher)