Farmer Field Day

Climate Smart Agriculture

Background

Climate change is posing a serious threat to the food security of Pakistan as a result of extreme events in the shape of drought, heat, floods, etc. The Pakistan agriculture sector is dominated by smallholder farmers who own less than 5 hectares but share in the country's food production is more than 80%. They typically harvest 50% lower than the large farmers and struggle to make their livings better. This severely affected the growth of the rural sector which is purely dependent on agriculture. More than 50% of the country's workforce is employed in the agriculture sector.

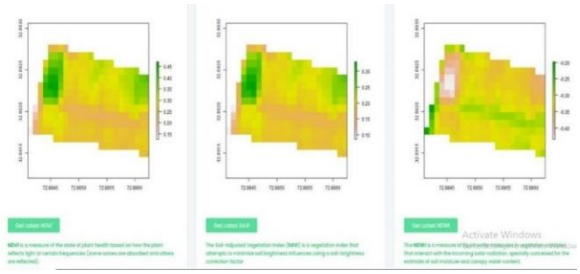
Pakistan has limited water resources and is on the brink of becoming a water-scarce country if we do not change our farming methods. Almost 92% of the freshwater is consumed by the agriculture sector which 99% of cases uses flood irrigation methods. The flood irrigation method water use efficiency is less than 50%. We need to adopt tested methods of soil and water conservation; the use of zero tillage and bed planting methods could help to reduce water losses by 40%.

About SAWIE

SAWIE Ecosystems is an unbiased platform promoting climate-smart agriculture practices, improving soil health, access to quality seed & nutrients, and appropriate crop protection solutions. It has proved that such practices have helped to improve crop yield and an exponential increase in their income. It has developed a knowledge center which is a rich resource to understand basic crop.

SAWIE Ecosystems provides real-time weather data, crop health, time for irrigation, fertilizer, pesticide application, and harvesting time. Also, connect farmers with inputs and output buyers and sellers.

The digital platform has successfully blended the digital solutions with the on-ground field interventions to combat climate severity by providing field-specific advice with a set of interventions. Such interventions include the preparation of seedbeds as raised bed planting, reducing the removal of previous crop residues, use of zero tillage, and irrigation scheduling.



Farmer Field School

Farmer Field School (FFS) is a participatory education approach that brings together a group of small-scale food producers to solve production problems through sustainable agriculture. The FFS approach offers space for hands-on group learning, enhancing skills for observation and critical analysis and improved decision making by local communities (FAO).

SAWIE adopted the FFS approach for training and capacity building of smallholder farmers in climate smart agriculture practices. It started this journey in Oct 2021. It has organised over dozen farmer field schools covering Rice, Wheat, Maize, Cotton, Sunflower and horticulture crops

It has successfully organized such sessions benefiting local farmers through FFS at Zaidi Farm. It has attracted local farmers, researchers, and the agritech community. The FFS implemented a participatory learning approach to train farmers by offering a farm walk, asking questions, and observing the impact of interventions.

The key emphasis of the interventions includes minimum soil disturbance, maintaining soil cover with crop residues, use of crop rotation, and crop diversification.

The FFS plays a crucial role in facilitating the bottom-up collaborative approach linking smallholder farmers, research, and financial institutions coming together to talk to each other and develop follow-on opportunities.

The Spring Farmer Field School took place at Zaidi Farm on 8th April 2023. It has exhibited the success story of the crops that were cultivated under the advisory services of SAWIE. Important interventions included were following;

I. Rice crop residue management
II. Raised bed planting
III. Sowing dates, optimum dates
IV. Use of pre-basic seed from research institute
V. Use of irrigation based on the SAWIE/ PCRWR advisory
VI. Fertilizer application based on soil testing
VII. Biofertilizer application
VIII. Mechanical planting for next season crop of Rice
IX. Promoting village seed bank

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Wheat Crop Showcasing

Wheat is one of the most important crops in Pakistan as a staple food for the nation. Pakistan's annual production of wheat is 25 million tons grown on the largest area of about 9 million ha (22 million acres). Despite its importance, the wheat crop yield is among the low-yield producing countries. The average yield is about 3.86 tons per ha (39 maunds per acre). There are several factors of low yield, it is mainly due to the use of uncertified seeds, lack of proper crop nutrition, etc. Recently crop harvest has faced several challenges, due to irregular patterns of heavy rainfall, which resulted in lodging. Lodging can have a significant impact on wheat yield and quality, and farmers may face challenges in managing lodged wheat.

Zaidi Farm is Growing wheat on 70 ACRES

Through the adoption of climate-smart practices at Zaidi Farm, the wheat crop health is very good, and did not experience many lodgings, despite heavy rains and stormy weather in March 2023. The lodging could risk up to 40% losses in wheat. This was mainly due to the implementation of bed planting and leaving rice crop residues in the fields.

S Similarly, on 16th April 2022, SAWIE celebrated "Farmer field day" at Zaidi farm to showcase the impact of SAWIE climate smart agriculture advisory service on Zaidi farm.

There are about 8 million smallholder farmers in Pakistan who own less than 5 ha but their contribution is 80% to Pakistan's food production. They harvest a low crop yield (typically 50% lower than larger farms) due to several reasons with few to mention here;

- Lack of knowledge of their soil health
- Fertilizer rates applied without a regular soil testing
- Lack of access to quality inputs
- Lack of access to proper farm machinery including tillage, planting, and harvesting
- Real-time knowledge of crop health
- Lack of access to markets for inputs and sale of their farm produce
- Lack of access to finance

Here comes the need for a platform that could provide such services on farmers' doorsteps. SAWIE platform is trying to develop an ecosystem approach through working in partnerships with the key stakeholders. SAWIE is promoting the lesson learned from Zaidi farm through FFS as a vehicle for capacity building of smallholder farmers, providing regular advisory on weather predictions, soil health, crop health, crop irrigation & nutrients, and guidance on seed-to-seed.

SAWIE is developing various ways to promote the knowledge, practices, access to technology and seeds through village seed bank. The Village seed Bank has several advantages that includes;

I. Fast track the spread of the new varieties to farmers level

II. It is cheapest way to promote cultivation of new varieties

III. Helps to increase the crop yield.

SAWIE is also working with partners to promote a village service provider who can offer the machinery and farm services on rentals to farmers on their doorstep. Also exploring the possibility of linking village produce with electronic warehouse receipts (eWHR) and other formal supply chains.

Farmer Field School 8thApril 2020 Key highlights

The FFS started at 10 AM and finished at 3PM at Kakar Village on Zaidi Farm in Sheikhupura.

Eng. Mushtaq Gill (Tamga e Imtiaz), CEO of SAWIE conducted the FFS together with Dr Abul Fazal and Dr Sohail Lodhi. The farmers, students, and agritech stakeholders visited the wheat , maize, vegetable fields along with the machinery on the farm. The participants also visited a Rice nursery sowing that was getting ready for mechanical transplanting in a few days time.

After the farm tour, few key talks took place.

Mr. Sultan Bhatti, a progressive farmer using climate-smart practices for the last 7 years on his farm, added his experience being a Rice-Wheat farmer of Pindi Bhattian for his conservation practices and reduced fertilizer and chemical costs by 60%. He has improved his soil structure and porosity for better-holding water and is also supper resilient at times of extreme heat and water scarcity situation. He pointed out that there is a need to change the mindset of our farmers who have been practising ploughing for decades.

Dr. Muhammad Javed, Director of Wheat Research Institute, Ayub Agri Research Center said, we are continuously developing new varieties that are high yielding but they could only perform better if farmers would adopt the appropriate agronomy practices that include sowing methods, soil preparation, and irrigation and fertilizer management to achieve higher yield potential. He encouraged farmers to select the seeds of the new varieties after carrying out roguing to protect purity of the crop.
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Prof Rana Iqrar Ahmad Khan, Vice Chancellor University of Agriculture Faisalabad said linking Farmers with quality seeds, other inputs, and markets would make a drastic impact to implement innovations on a farm level. We need to protect our soil health through bringing back organic matter to soils.

Mr. Mahmood, Advisor, RIZQ and ex WIT - LUMS, FAO, mentioned the need to adopt regenerative approaches to address emerging challenges of climate changes.

Dr. Abdul Wakeel, Associate Professor from the University of Agriculture Faisalabad, emphasized the need for use of balanced fertilizer. There is an immediate need to carry out soil testing on a regular basis.

Mr. Yahya Hameed Whala, head of agriculture financing, at Bank Alfalah, said, there is a need to upgrade our farmer's technology & machinery requirements to meet the challenges of climate change. We need to invest in zero tillage and happy seeder kind of technologies. State Bank of Pakistan has provided a special subsidy on investment in farm machinery at a 7% markup.

Dr. Abul Fazal, the host of the event on Zaidi farm said, we are working on three major pillars of conservation agriculture; minimum or no tillage to disturb the soil, land cover, and crop diversification for the last 10 years. We have seen a clear difference in yield and crop health in our fields compared to our neighbours. He is very keen and supportive of the village seed Bank supported by SAWIE through the help of the Wheat Research Institute. Last year he distributed the new varieties of wheat to about 20 farmers from the village and aims to carry on this year too.

Leading agritech experts that included Mr Adil Farooq, Dr. Anwar ul Haq, SAWIE experts including Miss. Hurain Tanveer, Mr. Mujahid, Mr. Ali Hasnain, Mr. Hassan, Mr. Haji, Mr. Muhammad Yousaf, Mr. Tariq Mahmood Lodhra, Dr. Adnan from Punjab University, Eng. Saleem Akhtar from the NRSP Rice project, and Sardar Baber, a progressive farmer along with the students, and farmers from the neighbouring villages took part in the discussions and field visits

Key Recommendations

The key take-home message of the FFS was farmers growing wheat should adopt climate smart agriculture practices to protect their crop from the growing threat of weather related uncertainties. Although farmers face a significant risk of losing money from lodging of wheat crop but could reduce these losses through adopting the following measures.

I. Choose the right variety: Farmers should choose wheat varieties that are less prone to lodging. Lodging-resistant varieties have shorter and stiffer stems, which can better withstand adverse weather conditions.
II. There is a need to develop & promote seedbed planting technology that can be used for planting seeds on raised beds. This helps to develop root system to access better absorb moisture and access nutrients.
III. There is a need to develop appropriate technology for zero tillage drills
IV. Use appropriate seed rates: Farmers should weigh 1000 seeds to come up with a suitable sowing rate. Ideally not more than 35 kgs depending on seed size and weight. Heavy plant population can cause competition for nutrients and lead to weaker stems that are more prone to lodging.
V. Sowing should be completed during month of October
VI. Carry out soil testing every 3 years to check soil fertility to apply the required dose of fertilizer.
VII. For flood irrigation fields, the fields should levelled before each crop or at least once in a year
VIII. Apply balanced fertilizers: Balanced fertilizers containing the appropriate amount of nitrogen, phosphorus, and potassium, can help improve plant growth and strengthen stems. Overuse of nitrogen fertilizer can lead to excessive vegetative growth, weak stems, and increased susceptibility to lodging and disease.
IX. Use plant growth regulators: Plant growth regulators can be used to control excessive vegetative growth and improve stem strength and make them more resistant to lodging.

X. Implement appropriate irrigation practices: Over-irrigation could weaken the root system and increase the risk of lodging. Farmers should implement appropriate irrigation practices such as raised planting based on the moisture content of the soil and the crop's growth stage.

XI. Control diseases and pests: Diseases and pests can weaken wheat plants. Farmers should do scouting to monitor their fields regularly for signs of disease or pest infestations and take appropriate measures to control them.

XII. Appropriate harvesting time could help farmers prevent losses and improve their yields and profitability.

Participants

Farmer's Field School at Zaidi Farm, Kakar Gill, Sheikhupura took place on 8th April 2023. The FFS attracted local farmers, researchers, students, and professionals from the agri-tech sector.

Key participants who took part in the FFS were;

- Farmers both local and across other regions including Jaranwala and Layyah
- SAWIE team from Lahore and Faisalabad
- Bank Alfalah team from Lahore
- University of Agriculture Faisalabad
- Ayub Agriculture Research Institute (AARI), Faisalabad
- LUMS
- Faculty of Agriculture, Punjab University
- SACAN

- Data Agro
- Dawood Agro
- Pakistan Council for Research on Water Resources (PCRWR)
- UPSIGN.

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