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Addressing environmental threats and health risks through responsible rice value chain and multi-stakeholder collaboration in Pakistan

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For many Pakistanis, particularly in Punjab, rice production serves as the backbone of the agriculture sector of the country. Rice is planted on about 11 per cent of the total agricultural land area during the summer or *Kharif* season. The crop also plays an extremely important role in its national economy, making Pakistan a global player in the rice-exporting industry. On average, the country produces 6 million metric tons of rice every year, and 4 million metric tons are projected to be exported.[1] However, environmental issues that raise health concerns are associated with rice production due to several factors.

THE CHALLENGES IN RICE PRODUCTION IN PUNJAB

Rice production in Punjab is marred by a high level of external input use, such as hybrid seeds, herbicides, chemical fertilizers, and pesticides, among others. Uncontrolled use of these inputs causes health issues, as well as pollution of soils, water, and the environment. Moreover, a majority of the hired workforce is composed of women, who are tasked with the laborious initial stage of sowing rice. This makes them more prone to health hazards, such as skin diseases, caused by the hot weather. After the harvest, the remaining straw is then burnt in the fields in preparation for planting the next crop (wheat). This activity not only decreases soil fertility but also poses environmental threats, such as smog and sudden weather changes, to many districts in Pakistan, particularly in Muridke in the Sheikhpura District.

RESPONSIBLE RICE VALUE CHAIN[2]

Through the Gender Transformative and Responsible Agribusiness Investments in South East Asia (GRAISEA) programme, Oxfam collaborated in Pakistan with Doaba Foundation (implementing partner), the University of Agriculture Faisalabad, and the Rice Research Institute (RRI) Kala Shah Kaku to identify environmental issues related to rice crops.

As part of GRAISEA interventions, the findings of this endeavor are being disseminated to and discussed with a number of

THE PERILS OF RICE STRAW BURNING. Traditional Punjab farmers conduct rice straw burning after the harvest to prepare the soil for the next cropping season. This is a common practice in both Pakistan and India. However, this activity causes environmental threats (loss of soil fertility, pollution) and health-related risks. It also increases the occurrence of smog, which worsens human health day by day. While smog can be attributed to many other factors, it has been observed in Lahore that smog occurrence is higher after the residual burning of rice straw. Due to the seasonality of the rice crop, large-scale burning of rice straw, including in neighboring India, is considered a major contributing factor. The increase in smog occurrence has, likewise, heightened public suspicions about sudden weather changes. Unfortunately, smog events get worse as time passes. (Photos by Reuters)

grower organizations (GOs) at different forums, such as multi-stakeholder platforms, seminars, and district-level sessions. Likewise, through the Sustainable Rice Platform (SRP), best practices in rice production are being introduced and promoted.

Through community sessions, the use of fertilizers and chemicals is being controlled; and the burning of remaining straw after harvest is being discouraged, while alternative methods are being introduced. Through these interventions, it is expected that environmental and health risks posed by rice production will be addressed and minimized.

During the first multi-stakeholder meeting, the Department of Environment Protection in Punjab was invited. Solid recommendations and suggestions were given by the participants. The Punjab government ensured actions at the policy level, which included investments in resource-saving technology, the preparation of a local district action plan to resolve smog-related issues, detailed vulnerability assessments of risks and hazards, and provision of subsidy for inputs.

Under the rice value chain project in Pakistan, in collaboration with Doaba Foundation, the project team also explored a new technology called the Happy Seeder, which is used for sowing wheat. By using this technology, there will be no need for rice straw burning.

IN FOCUS: THE STORY OF SHAMSHAD BIBI AND MANY OTHER WOMEN FAMERS IN PAKISTAN

A normal day for Shamshad Bibi starts at 6 in the morning, when she makes food for the family and cleans the house. Two hours later, she sets foot outside her home in Sheikhpura to start her work on the field. After spending long hours in the field, she suffers from headaches and muscle pain.

This is a story of a female farmer, who, like many others in the area, undergoes this routine day in and day out. Shamshad explains how the long hours cause mental fatigue, eye pain, and sickness. Despite all these, she needs to continue working to feed her family.

Shamshad's resilience is admirable; however, a much graver issue has emerged out of this. Heat and the lack of precautionary measures and adequate working equipment have resulted in many health problems for Shamshad and her family.

Unfortunately, this is a common experience for many women farmers in Pakistan. These issues affect many other women and children working in the rice fields. Exposure to fertilizers, insecticides, and pesticides, coupled with long hours in the sun with minimal protection, has resulted in persistent health concerns including eye infections, skin irritation and diseases, and respiratory illnesses. Earning bread for the household—income that is supposed to uplift the condition of poor people—has in itself turned into a threat to their well-being. (Photo by Shirin Abbasy)

LINKAGES WITH THE PRIVATE SECTOR TO MINIMIZE ENVIRONMENTAL THREATS CONNECTED TO RICE CROPS

The Pakistan project team is focusing on controlling the use of pesticides, putting an end to wheat and rice straw burning in the fields. Together with RRI, Doaba Foundation achieved the third benchmark of SRP (training), allowing farmers to maintain traceability and create linkages with the private sector.[3]

At the field level, the project team is engaging and mobilizing both farmers and the private sector for technical capacity building throughout the season. Moreover, GOs supported 70 farmers to link with the private sector, which allowed farmers to sell 1,300 metric tons of rice at premium prices and with the cost of transportation.

Likewise, farmers were guaranteed immediate payment compared to selling their produce in the local market. Rice farmers in GOs have enhanced bargaining power, and they secured a premium cost (PKR 1/kg) and transportation cost (PKR 0.5 /kg). This means that these farmers receive PKR 1,700

[TOP] HAPPY SEEDER AS AN ALTERNATIVE TO BURNING STRAW. The Happy Seeder is a tractor-mounted machine that cuts and lifts rice straw, sows wheat into the bare soil, and deposits the straw over the sown area as mulch. It therefore allows farmers to sow wheat immediately after their rice harvest without the need to burn any rice residue for land preparation.

The average cost of preparing the field for sowing wheat using the Happy Seeder was USD 60/ha, compared to USD 70/ha for using conventional methods. Thus, farmers save, on average, USD 9/ha by cultivating plots with Happy Seeder. This is not surprising as Happy Seeder is a zero-tillage technology. (Photo by Tahir Awan)

[LEFT] WHEAT CROP IN RICE STRAW. Planting the wheat crop in rice straw is introduced as an option to curb the environmental threats of burning straw. The field-based crop residues of rice can be used as compost to grow wheat. (Photo by the IRRI Rice Knowledge Bank)


PHOTO BY AHSAN MAHMOOD

for every 40 kilograms of rice they sell to Matco, compared to the base price of PKR 1,660/40 kg. This translates to a 4 per cent increase per kilogram in the income of farmers.

Together with Matco Food Pvt. Ltd., 60 rice growers were trained on sustainable good practices (third benchmark of SRP). A total of 860 farmers were also engaged in capacity building sessions at the field level. In accordance with SRP standards, Matco and the project team are working on traceability, contamination issues (rice, soil, and water), and registration of farmers, so that corporate social responsibility and value-added services can be shared by and secured for rice farmers.

The Pakistan team also conducted an orientation on Happy Seeder, with technical support from RRI. The use of Happy Seeder benefits farmers economically. Doaba Foundation has mobilized resources from RRI and introduced this machine without any cost. Many farmers are now using Happy Seeder after harvesting rice.

PROSPECTS AND LEARNING

There is a lot of small agricultural equipment that can be used to cultivate rice and wheat in Punjab areas. However, it is costly and not accessible to small-scale farmers. Because they cannot afford this equipment, they are left with no other option but to burn the remaining straw in the field.

To further improve the situation in Punjab, service centers at the cluster or community level are necessary. The private sector can also be engaged through its extension services to influence GOs and help them adopt modern technologies.

Although much still needs to be done, multi-stakeholder collaboration in the rice value chain in Pakistan has yielded positive results that have improved working conditions in the sector. Oxfam and its partners have helped establish 10 functioning GOs in Tehsil Muridke, in Sheikhpura District, where women take leadership positions in their executive bodies (at least 50%).

A total of 287 farmers have also improved their productivity yield with the support of the private sector (Matco) at the farm level. Local knowledge on nursery farming and land, soil, and water management has also been enhanced through successive training sessions attended by farmer-members of GOs and representatives from academia and the private sector.

Such meaningful collaboration has been key to ensuring that responsible rice production not only increases farmers' incomes but also protects the environment.

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[1] USDA Foreign Agricultural Service. 2017. *Pakistan: Grain and Feed Annual.* Washington D.C.: United States Department of Agriculture. https://www.fas.usda.gov/data/pakistan-grain-and-feed-annual-1.

[2] For more information about the rice value chain project in Pakistan, please contact Oxfam's MEAL Coordinator Asim Saqlain at asaqlain@oxfam.org.uk, or GRAISEA's Regional Programme Coordinator for the Rice Value Chain Pham Quang Trung at pqtrung@oxfam.org.uk.

[3] The three standards for Farm Productivity are: (1) crop calendar, (2) record keeping, and (3) training on SRP.

GRAISEA is a regional programme funded by the Government of Sweden. It aims to improve the livelihoods of women and men small-scale producers in Asia through responsible, gender transformative value chains and private sector investments.

For more information about the programme, contact the GRAISEA Programme Management Unit at **graisea.pmu@oxfam.org.uk**.
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