

Project information sheet



Name of the project	Increasing productivity and profitability of pulse production in cereal-based cropping systems in Pakistan
ACIAR project number	CIM/2015/041
Start date and duration (years)	1 July 2016 – 30 June 2021 (5 years)
Location	Pakistan
Budget	\$2.3 million
Project leader(s) and Commissioned Organisation	Dr Ata-ur Rehman Charles Sturt University arehman@csu.edu.au
Partner country project leaders and their institutions	Dr Shahid Riaz, Pakistan Agricultural Research Council, Islamabad Dr Ataul Mohsin, University of Arid Agriculture, Rawalpindi Dr Zulfiqar Ali, Muhammed Nawaz Sharif University of Agriculture, Multan Dr Aijaz Soomro, Sindh Agriculture University, Tandojam
ACIAR Research Program Manager	Dr Eric Huttner

Overview

Over the past 20 years, demand for pulses in Pakistan has been growing, while production has been slowing. Despite relatively high prices, legumes—especially chickpea and lentils—have been pushed out to the most marginal lands, with labour shortages constraining weeding and harvesting of these species.

Re-introducing legumes in cropping systems would have nutritional, economic and environmental benefits, and the Pakistan government has identified it as a priority for agriculture development.

Consultation with local stakeholders has identified several issues, including:

- low productivity of lentils due to:
 - lack of access to high yielding varieties
 - poor agronomic practices, including weed control
 - inefficient crop establishment
 - limited options for disease management
 - poor harvesting techniques
 - poor postharvest management.
- labour shortages constraining weeding and harvesting of these species
- risk of chickpea crop failure and damage due to *Ascochyta* blight disease, and insect (pod borer) damage, which are causing inferior grain quality attributes, due to lack of access to resistant varieties

- groundnut crop not achieving as a major crop in suitable areas, due to deficiencies in planting, harvesting and postharvest technologies.

Research

This project focuses on improving the production and profitability of lentil, chickpea and groundnut—through research led by farmers with the support of researchers—to reverse the decline of these crops. The project will:

- identify agronomic factors that limit the productivity and profitability of the three crops, and evaluate possible solutions
- increase opportunities for farmers to add value to their crop, by adapting and demonstrating food processing technologies suitable for smallholders
- develop and evaluate site-specific village-based seed production and seed dissemination systems to increase farmer access to improved varieties
- disseminate the learning and practices from the project activities to other farmers and private sector participants, such as input suppliers and potential service providers.

Achievements 2018-19

1. The project is using a participatory research strategy where project farmers are core participants in the research activities. Groups for Collaborative Research (GCR), made up of 15 farm families and researchers were established at six project sites. These sites were selected on the basis of their contribution to the national pulses production. The sites are: Site 1: Fatehjang, Site 2: Chakwal, Site 3: Bhakkar in Punjab province, Site 4: Karak in Khyber Pakhtoonkhwa (KPK) province, Site 5: Larkana Sindh province and Site 6: Jafferabad in Baluchistan province.
2. Two years of varietal trials for chickpea, lentil and one year for groundnut have been completed at project sites. Sites 1 and 2 have all the three crops, chickpea, lentil and groundnut. Site 3 has chickpea and lentil while Site 4 has chickpea and groundnut. Site 5 and 6 have chickpea and lentil. After two years, having different climatic conditions each year, farmers are now in better position to select the varieties for their area. GCR farmers preferred chickpea variety Bittle 2016 at sites 1, 2, 3 and 5 as it showed wider adaptability and acceptability. Fakhr e Thal variety was preferred by the GCRs family farmers at site 4. Bhakkar 2011 was the second preferred chickpea variety at site 3. However, KK-1 was the preferred variety at site 4 and 5. The lentil variety Punjab masoor was the first preference of farm families at site 3 while Markaz 2009 caught eye of family farmers at site 1, 2, 5 and 6. During first year of groundnut varietal trials 2018, GCR family farmers selected BARI 2016 at site 1 and site 2 while BARI 2011 was preferred by family farmers at site 4. This year groundnut trials with GCRs are in fields.
3. The base line report of farm level situational analysis has now been completed. The issues identified in the situational analysis with farm families included non availability of quality seed, seeding rate, weeds, no knowledge of inoculation and seed treatment with effective fungicide. Little knowledge on IPM for insect management. These issues were converted in to researchable questions and accordingly experiments were planned and planted with farm families in 2018-19. This will help testing and adoption of improved pulses production technology along with capacity building of the farm families to tackle issues related to crop production in more scientific way. Economic analysis of all these new interventions was also done along with GCR families to enable them to decide the financial viability of new interventions.
4. The seeds of top 5 chickpea and 2 lentil varieties, favoured by GCR farm families during 2017-18 varietal trials on each site, were multiplied by the participating seed producing farmers in 2018-19. In this regard project was able to engage private sector for chickpea seed

production. Under the agreement the company will buyback the seed from the seed producing farmers and next year this seed will be available to other farmers for sowing. Presently, chickpea seed of 1400 Kg of Bittle 2016, 600 Kg of Fakhr e Thal, 2350 Kg of Bhakkar 2011 and 2450 Kg of KK-1 is available with GCR farm families.

5. For expansion of project activities and sustainability after the project life NRSP (National Rural Support Program) was also involved at site 1, 2, 3 and 6. At site 5, SRSO (Sindh Rural Support Organization) has been engaged. This will help increase the network of the farmers testing and adopting the interventions being tested with GCRs under the project. Since, no company has tendered its interest for lentil and groundnut seed production the project is working for establishment of village based seed banks with NRSP at site 3 and with SRSO at site 5.
6. The project has been integrated under the Aik Saath umbrella program supported by ACIAR to coordinate the various ACIAR projects in Pakistan. The team participated in inception workshop of small ruminant project where synergies were built for working in close collaboration at two common project sites i.e. Bhakkar and Chakwal. The project is also in close collaboration with pulses value chain project and initially shared the information of the farm families of different project sites. Although, MDF is not directly working for pulses but they have provided useful contact of the private company which is now engaged in chickpea seed production.
7. Conducted situational analysis regarding farm level value addition of pulses to increase opportunities for farmers to undertake postharvest value addition to chickpea, lentil and groundnut crops, by adapting and demonstrating food processing technologies suitable for small holders to add value to crops where appropriate.
8. Two workshops and three farmer field days were organized in 2018-19. At site 3 a training workshop on integrated pest management (IPM) of chickpea was organized which was attended by 200 farmers including farmers of NRSP. A value addition workshop on pulses value addition was conducted at PMASAAUR in which GCRs, students, academia and researchers from different institutes participated. GCRs were exposed to different value addition options of pulses. One farmer field day was conducted at site 4 on post harvest management of chickpea, its safe storage and different value addition opportunities. Sixty five farmers participated in the event. Another farmer field day/ seminar was conducted at site 5 on "Improvement on of Chickpea productivity and profitability at farm level in Larkana area" which was attended by 100 farmers including GCRs, extension workers, academia from Sindh Agriculture University and researchers from provincial research institutes. A farmer field day to share the success story of ZERO tillage technology for lentil sowing at site 6 was organized. The technology resulted in better and timely crop establishment with good control of weeds and moisture conservation. Fifty farmer including GCRs attended the field day activity.
9. 1st Aus Pak International Conference on pulses for food security was organized by Muhammad Nawaz Sharif University of Agriculture, Multan. Scientists from national and International research organizations and universities participated in the conference.
10. Alterations in groundnut harvester demonstrated last year have been well discussed with farmers, service providers and agriculture engineers and suggestions have been shared to the manufacturer for improvement.



