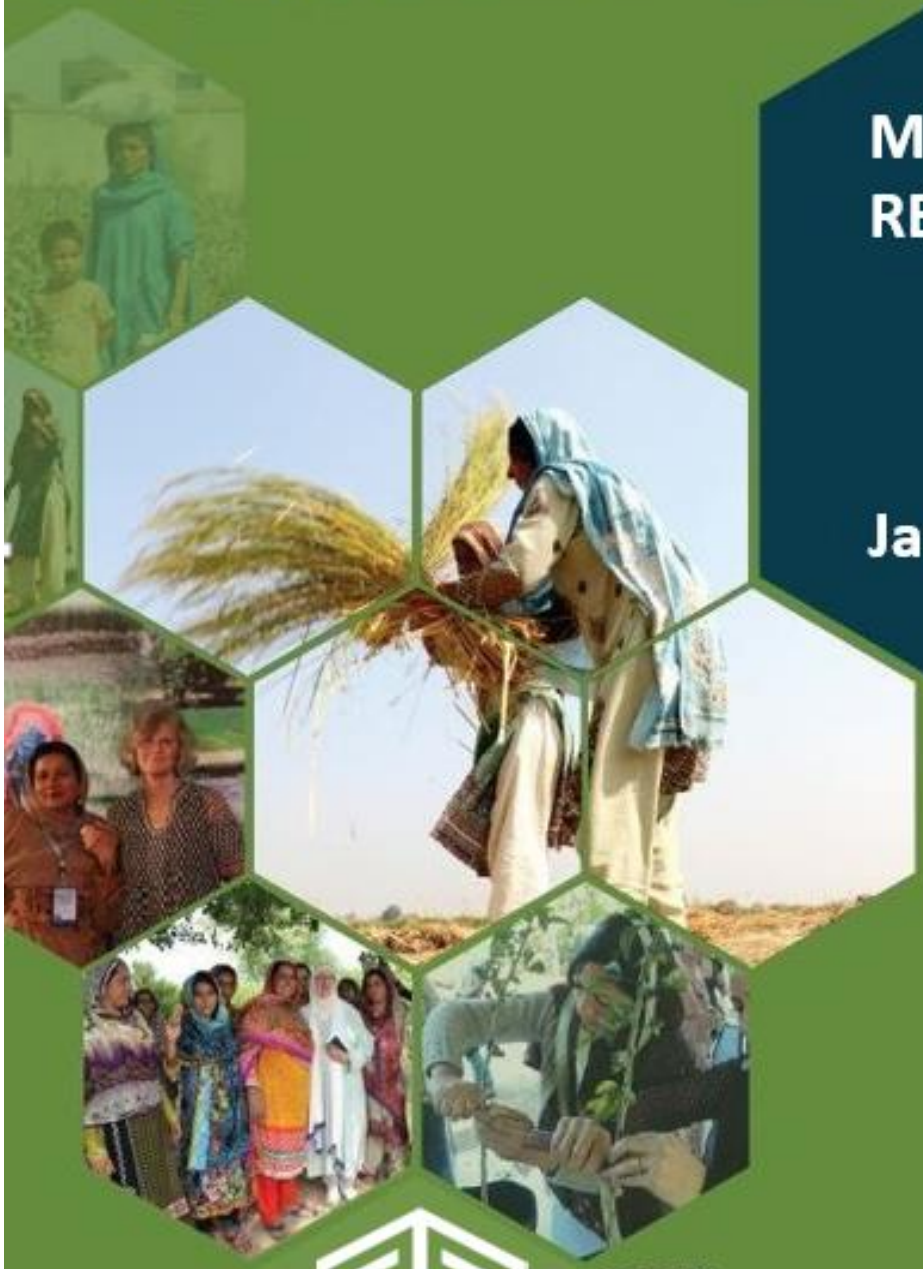
Increasing productivity & profitability of pulse production in cereal based cropping systems in Pakistan

Australian AID

MID TERM REVIEW REPORT

January 2019



ACIAR
aciar.gov.au

VISION
The Australian Centre for International Agricultural Research (ACIAR) looks to a world where poverty has been reduced and the livelihoods of many improved, through more productive and sustainable agriculture emerging from collaborative international research.

ACIAR Corporate Plan 2017- 2021

Country Office – Pakistan

Contents

The Australian Centre for International Agricultural Research (ACIAR) was established in June 1982 by an Act of the Australian Parliament. ACIAR operates with a mission to achieve more productive and sustainable agricultural systems, for the benefit of developing countries and Australia. It commissions collaborative research between Australian and developing-country researchers in areas where Australia has special research competence.

Kazmi, Munawar and Gerard McEvilly (Eds). 2019. Mid Term Review Report – Increasing productivity & profitability of pulse production in cereal based cropping systems in Pakistan.

Foreword

The Australian Centre for International Agricultural Research (ACIAR), a small research-funding institution, has a well-established project monitoring & evaluation (M&E) system -developed over 30 years. As a part of the M&E system ACIAR undertakies reviews (both midterm & final) and impact studies of its projects. The Mid-Term Review (MTR) is an important mile stone in the project implementation journey and involves independent reviewers, from Australia and from the partner country. These reviewers interact with the project team, visit project sites and have dialogue with participating communities. The objective is to explore progress of the project, assess hurdles and challenges and provide expert opinion for further work.

Abbreviations

ACIAR	Australian Centre for International Agricultural Research
AZRI	Arid Zone Research Institute, Bhakkar
BARI	Barani Agricultural Research Institute
BZU	Bahauddin Zakariya University,
CSU	Charles Sturt University
MTR	Mid-Term Review
MNSAU-M	MNS Agriculture University Multan
NARC	National Agricultural Research Centre
PARC	Pakistan Agricultural Research Council

Acknowledgments

The cooperation of all project partners (PARC, NARC, BARI, UAAR, MNSUA, BARI, AZRI) and most importantly the farmers for helping in implementation of the project.

The 3 local Project Officers Ms Tehrim, Mr Israar and Mr Manan provided excellent formal and informal information and support to the review team and their assistance is acknowledged and greatly appreciated.

As usual, ACIAR Country Office (Ms Noor and Dr Kazmi) and the Security and Transport sections of Australian High Commission Islamabad provided excellent support and their help is greatly appreciated.

We are also extremely grateful for the efforts of the reviewers in conducting this review. Dr Eric Huttner compiled the report on which this document is based

Recommendations

For Project Team

General

- Upgrade the annual report of 17-18 to the expected ACIAR standard, provide missing information, analyse results, synthesize findings and draw conclusions about the next steps of the work.
- Provide the missing documentation as planned and committed in the project document and in subsequent activities: Collaboration plan, Communication plan, Stakeholder communication plan, M&E plan. The Collaboration Plan will include considerations of: PSPD Mega Project; Punjab Province (Rain gun, etc.); Policies (in Situation Analysis report; to guide other research activities; to prioritise innovations); Value Chain (assist their prioritisation, market analysis, identify key innovations); Fodder with the small ruminant project; Groundwater and Irrigation projects (moisture sensor, sustainability of groundwater extraction, best practices guidelines, etc.).
- Produce a technical report summarising the conclusions of the Situation Analysis. This report is targeting the Pakistani stakeholders. Its aim is to contribute to the body of knowledge required to inform and guide stakeholders in their decisions and investments in pulses research and production. It should include consideration of the various growing regions, their common issues and their specificity. Together with biophysical, economic and policy knowledge already available, the analysed results of the Situation Analysis should help target the areas, technologies and policies for increasing pulses production. For ACIAR's interest: evaluate (with example or evidence) the balance between: "Situation Analysis is generating new knowledge critical for prioritising the research", and "Situation Analysis is a necessary tool for engaging farmers in the research process".
- Consider research opportunities, possible impacts and collaborations on: zero-tillage for crop establishment (with fertiliser delivery); water management; reducing soil moisture loss. Report about these opportunities in the 18-19 report.
- Value addition: Except for simple on farm storing, grading and packaging, the project should conduct simple market studies prior to committing to experiments on the production of new commodities. The report of 18-19 should describe the plan for such studies and the corresponding value addition activities.

Impact Pathway and Scaling Up

- To foster ongoing impact after the end of the project, the project should analyse the impact pathway of the innovations it is researching, trialling, demonstrating and eventually aiming to disseminate.
- The report for 18-19 should present the results of the impact pathway analysis, and how these results guide the research and the stakeholder engagement. Innovations include seed, agronomic practices (machinery, novel inputs, etc.), inoculants, water management and irrigation.
- An initial Scaling Plan should be prepared early in year 19-20 and subsequently updated and implemented towards the end of the project. The Scaling Plan should present how innovations from the project can be scaled out, the required activities, who is responsible for them, and what the project will do in its final years to foster and assist scaling.

Germplasm transfer

- Facilitate germplasm transfer from Australia to Pakistan and report in the 18-19 report. The project should consult Australian herbicide experts to ascertain the value for Pakistan of the herbicide tolerance trait used in Australian lentils.
- Following this consultation the project should draft a plan for the use of the trait in Pakistan, for consideration by breeders at NARC, possibly under PSPD Mega Program.

- If Pakistan germplasm of interest to Australian breeders is identified, the project should also facilitate the exchange of this germplasm.

For ACIAR:

- Consult stakeholders and country office about the need for, and the membership of, a Steering Committee.
- Collect lessons from the modalities of operation of the project and the evaluation of the thorough participatory strategy adopted by the project.
- Ensure optimal connection between this project and ACIAR and other Australian projects in Pakistan to increase the efficiency of the Pakistan Program as a whole.

For the partner country:

- The project has seen evidence that showing interest and attention to the question of innovation in pulses is motivating farmers to reconsider the role of pulses in their system. Once confirmed and ascertained, the project findings in the next 1-2 years should be promoted widely.
- Streamline the management of funds between NARC and Karak Research Centre.
- Through a dialogue between BARI Chakwal and Arid Agriculture University Rawalpindi, the role of BARI in research activities at Site 2 and the corresponding management of funds should be revisited and settled.

Background

ACIAR has been supporting a range of projects in Pakistan. These projects are at various stages of implementation. One of the important projects has been on pulses - aiming to improve pulse industry and nutritional status of small holder families by engaging both women and men at all levels of activities and promoting female role models.

The project *Increasing productivity and profitability of pulse production in cereal based cropping systems in Pakistan*; intends to enhance the production and profitability of chickpea, lentil and ground nut in the existing cropping systems of Pakistan. The aims to address the decline of pulses production in Pakistan by understanding limitations and constraints to pulses production and designing, testing and demonstrating possible improvements, resulting in increased productivity and profitability. The project is aligned with a key priority of the government of Pakistan. The project proposed to operate mainly through farmer led research and demonstrations, and started activities in December 2016. During the first 2 years, the teams have been built and have started to operate on the ground. Key staff have been trained. It is now timely to review activities, outputs, outcomes, limitations and constraints in order to revisit and adapt the next 3 years' activities to maximise the chances the project will deliver on the objectives and the aim.

This will be achieved by engaging farm families to undertake farm based activities based on participatory action research and the application of an inclusive learning approach. The project objectives are as follows:

- Identify agronomic factors limiting the productivity and profitability of lentils, chickpeas and groundnut, and evaluate possible solutions through farmer led research and demonstrations of suitable innovations
- Increase opportunities for farmers to undertake postharvest value addition to chickpea, lentil and groundnut crops.
- Develop and evaluate, in partnership with farmers, site specific village-based seed production and dissemination systems to facilitate access to improved varieties.
- Disseminate the learning and practices from the project activities to farmers, private sector(input suppliers) and potential service providers

Through farmer field schools (on the land of the selected research farmers), the extension services, NGOs and private sector agents, the project aims to communicate its results to 9,000 farmers initially. Adoption of the proposed and validated innovations would make pulses production more profitable and create the incentives farmers need to increase pulses in their cropping system.

Personnel	**Institution**	**Countries**
Dr Ata-Ur Rehman, Project Leader	CSU	Australia
Dr Shahid Riaz, Project Coordinator	NARC	Pakistan

Review team members

The review team comprised:

1. Gerard McEvilly, Value Chain Expert
2. Dr Nazim Hussain Labar, Agronomist, BZU, Multan, Punjab
3. Eric Huttner ACIAR Research Program Manager (Crops)
4. Munawar Raza Kazmi, ACIAR Country Manager Pakistan

Methodology/approach adopted for review

The review was conducted from 09 to 14 November 2018. Prior to interaction with the project team, the reviewers were provided with project proposal, impact pathway along with annual report. Later reviewers attended the formal sessions of presentations and consultation with project team members. The review team also had the opportunity to visit project sites and interact with farmers.

The review team reviewed the latest annual report, and evaluated it with reference to the project document.

The project team completed the "What has been achieved" column of section 4. The project team presented to the review team the activities, results and outcomes to date, at a meeting in Islamabad on 12th November where all participating teams (except Barani Agriculture Research Institute Chakwal) were represented. The review team had requested for external stakeholders to attend the meeting and contribute to a specific session, but because of flight cancellations, the reporting meeting was shortened. The small number of external stakeholders (from Pepsico, CIMMYT, Small ruminant ACIAR project, who did attend did not have a specific opportunity to make comments. A representative of the large NGO "National Rural Support Program" had to cancel attendance at the last minute.

The reviewers also had informal discussions with Dr Yusuf Zafar (PARC Chairman) and Dr Ameer Irshad (Pakistan Planning Commission), providing useful information on the ongoing relevance of the project, its alignment with priorities of the Government of Pakistan, and opportunities for linkage with other activities. Field visits allowed for informal discussion with team members and participating students.

The Report:

General observations and comments:

Project Focus: The rationale of undertaking pilot scale, farm-based trials of a range of innovations (most of them well established in other contexts) is to create applicable knowledge and awareness, together with the context specific constraints and requirement for their adoption. Starting from a generally sound initial basis as reported to this review (with significant qualifiers detailed below), the project now needs to plan the next 3 years to reach broadly applicable conclusions. Small scale development impacts in research sites and their neighbourhood are a step towards the aim of the project but are not the end. There is a risk that the project could satisfy itself with the localised impact, and skirt the more complex work required in the final years in nuanced communication of results, stakeholder engagement, ground truthing of its findings at scale and collaboration with other projects.

Relevance: The aim and the objectives are as relevant, or possibly even more relevant, today, as they were when project was designed. The commitment of the Government of Pakistan (Central, Punjab, probably others too but not evaluated) to project activities and to larger additional activities with the same aim is clear. It is particularly pleasing to see additional activities from NARC on germplasm evaluation (possibly breeding in the future) contribute to this project. The integration of these activities with the project provides a model for future cooperation with the PSPD Mega Program.

Mode of operation: Dedicated Project Officers hired by the project play an important role: this mode of operation appears effective in the Pakistan context – as observed in other ACIAR projects. Engagement of the Australian team is high (consistent with the project document) and highly valued by the local partners. The project relies on regular communication, frequent visits, and offering training opportunities.

Team and activities: The team has been assembled and is operating well; this is due in large part to the convening power, leadership and dynamism of Project Leader Dr Ata u-Rehman. The large numbers of local partners are enthusiastic and committed. Minor administrative issues around the management of project funds are hindering the full engagement of the KPK government team in Karak (Site 4) and need to be solved. The project would benefit from a stronger engagement of BARI, Chakwal) in Site 2 activities: a clear definition of BARI's contribution to the project and a streamlining of the management of funds by Arid Agriculture University Rawalpindi seem to be an easy solution, to be reached directly by the 2 organisations, with facilitation by the Project Leader (and ACIAR Country Manager) if necessary.

Cooperation with aligned projects supported by Australia in Pakistan: Despite facilitation and the provision of resources to foster collaboration between aligned projects, the opportunity for cross project activities, of benefit to the overall Australian program, remains to be actioned. An explicit collaboration plan has been produced but not seen by the review team. Discrete opportunities, with low transaction costs, have been identified. ACIAR and the project should ensure that benefits from cooperation are captured.

Review meeting presentations: because of the deficiency of the annual report, most of the information about research progress was received through the meeting presentations. The Overview presentation by Pakistan Project Leader Dr Shahid Riaz provided excellent synthetic information about the project, and underpins the review panel's confidence that the project is on track overall. The broader Pakistan context for the project was presented by Mr Manan and the participatory (farmer engagement) strategy adopted by the project was introduced by Prof Chris Blanchard. More specific information about activities and results was then provided by individual presentations from the six sites. The presentations focused on results but did not present analysis, conclusions and next steps. It is too early after effectively only one season of a small number of technical trials, experiments and measurement, to expect a comprehensive analysis of the technical results (activities from 1.5). However the lack of analysis and reporting of the results of the Situation Analysis (activities 1.1 to 1.4) is concerning and raises the question about the role and utility of these activities.

Because participatory approaches are commonly used but rarely evaluated in ACIAR projects, ACIAR would greatly benefit from learning from this project on this topic.

Situation analysis:

As noted above, despite the importance of this body of work, little has been reported and no explanation about the application of the results has been provided.

Situation analysis was undertaken in two stages as noted in 1.4 below. All the following activities (1.5 to 1.12) for Objective 1 are predicated on the results of this situation analysis, which will also have a major influence on the best options for implementing Objectives 2, 3 and 4. This process was to "derive an understanding of the socio economic environment of participating households from the perspectives of women, men and youth. That examination will include drivers and disincentives for pulse production, develop an annual calendar of events including cropping calendar, seasonal labour demand and limitations, seasonal cash flows (including periods of cash stress), land ownership and control including farm based decisions and policy environment" (quoted from project proposal).

Stage 1 (December 2017) involved Focus Group Discussions with separate groups of participating males, females and youths in each community. Stage 2 involved interviews with each of the 90 individual farm family groups. At the review meeting, the team mentioned that Stage 2 was completed in June 2018, although this is unclear from the annual report.

The Annual Report, received August 2018, stated that Stage 1 had been "conducted successfully with selected farm families' at all six selected project sites. Results were analysed and collated in form of report." This report was not provided to ACIAR or the review team.

The Overview presented at the meeting claimed the Results/Achievements from the situation analysis were:
"(1) Understood socio-economic situation of project sites from the perspective of women, men and youth, and;
(2) Identified major issues related to pulses production".
The full presentation of the situation analysis presented a lot of information relating to (2). This indicated the extent of the data collection task undertaken by the social science team. However, there are a number of recommendations for capturing the results and benefits of these activities:

- Evidence should be provided urgently for claim (1), given the elapsed time, the existing report and the importance of this aspect in the proposal, including (quoting from proposal: "the role of women in the production system, processing and value adding options for pulses; Empowering women and girls: research will ensure that women's contributions are maximised and their interests are protected; inclusion of men, women and youth in knowledge generation will enhance the status of women and youth as well as men; will enhance the role of women and youth in on-farm knowledge generation and decision making."
- The social section of a comprehensive report could be the basis of a presentation at the ACIAR Seeds of Change conference in Canberra in April 2019, if of high quality, and generally informative to others, both about the methods and results. (recommendation)
- The information presented in support of claim (2) should be analysed, with the aim to draw conclusions, rather than being presented as datasets.
  The aim of the situation analysis is to provide a rich understanding of each of the six communities separately, in order to address each one's situation and needs, through tailored research. However, there is scope to learn from comparing and contrasting these localised findings. For example, production data was only presented in a consolidated (national) format. This data should be disaggregated by region and combined with regional climate and rainfall data in order to enrich the findings about major production issues in each region. This is particularly important given the different rainfall/irrigation constraints in each region.
- Distinguish areas first and foremost based on water availability and explore the corresponding scenarios for increasing crop production.

- The analysis should acknowledge and discuss the possible (likely) bias in farmer selection, while explaining the rationale for the selection process used (eg working with progressive farmers will maximise early impact and is likely to enhance longer-term impact).
- The analysis should include the results of the Policy project when relevant.
- Recognise the difference chickpea grain vs chickpea vegetable production.
- Older lentil production region between Lahore and Islamabad (Sialkot): Could be the target of scale out, using growers visits as the first step. This opportunity could be addressed in the Collaboration plan with the Megaproject or other projects. recommendation
- Once a more rigorous analysis is prepared, this should be published in an appropriate format, including a brief technical report (including Policy aspects) targeting Pakistan audiences: in government, private sector, NGOs, researchers and other potential scaling organisations.

Field activities:

Work done by project team is good overall and the initial choice of growers is excellent. The review team visited the site 2 in Chakwal and met ground nut growers, with a host farmer selected for seed multiplication. The knowledge and confidence of the grower was good. At the time of the visit, the crop had been harvested. The farmer briefed reviewers about the trial and crop agronomic practices, mentioned the 30% loss due to mechanised harvesting, and the field day where other growers saw the new varieties and purchased seed. This is very encouraging that many growers have got new variety seed for their next crop along with the knowledge from experts. Another farmer family visited at Talagang were groundnut and chick pea growers, with a sound knowledge of growing these crops. Chickpea variety trials just planted were well managed. They have also the same complaint about groundnut post-harvest losses.

Experimental issues which need to be addressed:

- Clarify and harmonise the fungicides to be used: the products should be available.
- Farmer-based expertise needs to be complemented by technical expertise possibly missing in the project, apply more rigour: eg. Entomologist for IPM. Agronomy for weed control. Pathologist for the fungicide treatment. Water and soil for supplementary irrigation. A link to the relevant activities in the Megaproject PSPD may be one modality.
- Farmers' seed rate as investigated seem to explore excessive precision (increments of 10 kg/ha?) possibly inaccurate. Try broader range, fewer steps.
- Explain whether and why IPM research and training is happening only in Bhakkar. The role of extension and commercial linkages is to be established before or when the research is being done (see under Impact Pathway)

Reviewers support the continuation and expansion of current topics observed and presented: Inoculum; IPM for insects; Post-harvest (as well as other areas not presented or discussed). We approve the use of farmer field based training so that farmers learn by doing. In addition, topics for further investigation, cooperation and dialogue, in the areas where they are relevant include:

- Farmers training programme at different phenological stages of crop along with seed preparation
- Improvement of soil health beyond fertilizers: effect of inoculation of seed, manure, etc.
- Harvesting machinery optimisation for groundnut.
- No-till (or limited tillage) for efficient sowing, soil moisture saving and application of fertilizer. (NB: Zero-tillage-seeder for wheat to be calibrated for pulses (also applies to mungbean)).
- Water and soil moisture management, linking with ACIAR water projects: guideline about groundwater extraction and use; explore (and address if needed) concerns with over-extraction. Mulching small scale. Soil

moisture sensor. Rain-gun opportunity to be presented in the report and to be acted on in Collaboration plan.

Value addition:

The proposed work should take into account that most farm level value addition are likely to be uncompetitive once industry is engaged. A simple market analysis is needed before any effort is expanded on peanut oil. Engagement with private sector was unsuccessful to date but this is not unexpected at this stage and should be continued, including with the Australian supported Market Development Facility. While we were told by farmers that peanut food safety (aflatoxin) is effectively managed by proper drying, the team may consider doing a literature review (and key informants discussion) on what is known about aflatoxin in Pakistani pulses.

Capacity building and training

The project is doing well by involving Postgrad students in field activities, with their supervisors: project should ensure enough supervision is provided and the results of student activities are well captured to contribute to project. Since this is a research project, training activities should be a mean to impact, not an end. They need to be evaluated: what are the training outcomes.

The next 3 years: Impact Pathway analysis and Scaling Plan

- Impact pathway need to be thought through.
- Rhizobium impact pathway (NB: Inoculating seed may not be needed if fertiliser is fortified with inoculum, available from fertiliser companies but unproven).
- Seed impact pathway: Distribution plan first; grower to grower dissemination. Seed replacement scheme. Priming technology (linked with soil moisture monitoring?).
- Machinery for harvesting, crop establishment.
- Scaling: Start now and update regularly the strategy (to be ready for when project finishes). Private sector and NGOs. MDF. Link with megaproject.
- Sector rather than private kitchens. Example of grading as a low cost value adding (for grains and seed).

Opportunity to foster Australian cooperation with Pakistan: Breeding – Germplasm exchange.

The project can substantially contribute to the Pakistan pulses breeding program by facilitating the transfer of germplasm from the Australian gene bank to the Pakistan breeding teams. A line of lentil with tolerance to herbicide is of particular interest to Pakistan. If interesting material was identified in Pakistan, Australian scientists should also request transfer of the material under the same SMTA.

Appendix: Project Plan, Results and Comments

Preparatory, inception, and management activities

No	Activity	Outputs/milestones	What has been achieved?	Comments
1	ACIAR-CSU contracting/ Partner contracting.	Signed contract between CSU and ACIAR & with the local partners	Completed	
3	Planning with partners, ACIAR sister project(s), and ACIAR	• Agreement on dates, venue, and participants in inception workshop and co-ordination with other projects • Inception workshop timetable • Agreement on internal communication with partners • Agreement on modes of co-operation with ACIAR sister project(s).	Completed	
4	Draft plans for stakeholder communication, impact pathways, and project monitoring and evaluation	Draft plans ready for discussion at inception workshop.	Completed	These plans have not been provided. They may need updating as per the training and facilitation provided subsequently and the cooperation plans.
5	Inception workshop	Meeting held Report on the inception workshop	Inception meeting was held in Islamabad, Pakistan in Dec, 2016 and the reported by Dr Eric Huttner	
6	Finalization of plans for stakeholder communication, and project monitoring and evaluation plan	Draft plans (from 0.4) finalized after discussion at inception workshop	The approach and plans for stakeholder communication will be reviewed and modified as appropriate on an annual basis. The M & E plan will be further refined using the MTR results and other information provided by the project team. The initial impact pathways will be evaluated and modified so as to align with the current activities in the project. In addition, the impact pathway will be developed to align with the project's developing theory of change.	Impact Pathway Analysis and M&E planning facilitation provided by AVCCR July 2017. Stakeholder planning facilitation in both July 2017 and September 2018 annual meetings. Follow-up facilitation and training by AVCCR Jan 2018. Program Communication plan requested by AVCCR November 2017. Plans not provided. No evidence of implementation.
7	Establish a project Steering Committee with representation	Committee meets and review progress, implementation arrangements and work plans	The project Steering Committee has not been established. The issues and	Noted. Ask stakeholders and country office for input.

	from key Pakistan stakeholders	and provide recommendations to ACIAR. Committee to participate in annual review of the project.	processes to establish the committee can be considered as part of the MTR.	
8	Mid Term Review (MTR)	Project provides input and assistance as requested.		
9	Annual review	Meetings of 1. Project team to review results, and prepare work plan for following year. 2. Steering Committee meeting to review progress, implementation arrangements and work plans, and provide recommendations to ACIAR 3. Annual report in the prescribed format delivered to ACIAR on time.		Annual report 17-18 not comprehensive. No data, no analysis, no planning.
10	Final review	Final report in the prescribed format delivered to ACIAR on time. Project provides input and assistance to the final review as requested.		

Objective 1: Identify agronomic factors limiting the productivity and profitability of lentils, chickpeas and groundnut, and evaluate possible solutions, mostly through farmer led research and demonstrations of suitable innovations

No	Activity	Outputs/milestones	What has been achieved?	Comments
	Conduct an inception workshop to develop a shared understanding between all the stakeholders of project processes and outcomes and develop an implementation plan.	Inception workshop conducted. Results and conclusions disseminated to research team	Completed Dec, 2016 The inception and the operational planning workshops were organised through the funds provided by the Graham Centre for Agricultural Innovation (Graham Centre) in December, 2016. The MSA was signed by all the heads of the participating organisations. The draft operational plan was deliberated in the 5 day workshop conducted soon after the inception workshop. The salient feature of the workshop included 1. Formation of initial field survey operational plan 2. Conducting of Farmer Field Schools. 3. Formation of agronomy group to identify the indicators to be included in the field survey to identify problems in current practices and possible solutions and to facilitate the training of the trainers. 4. Formation of seed multiplication team to identify potential farmers and their training to produce quality seed for distribution to farmers. 5. Formation of value addition team to initiate farmer lead activities resulting in identification and execution of at least 6 value added products of commercial importance.	"Farmer Field School" name and concept replaced by "Community Research Groups" to reflect the engagement of the selected farmers in research design, not only in "training".
1.2	Select experimental sites. There will be six experimental sites one in each of 6 districts of Pakistan (Punjab 3, KPK 1, Sindh 1 and Baluchistan 1).	Sites selected	Six experimental sites one in each of 6 districts of Pakistan have been selected and villages identified for each of the crops as follow Site 1. Chickpea. Village Bajwal, District Fatheganj, Punjab Site1. Groundnut. Village Laniwala, District Fathehganj, Punjab Site 2. Chickpea and Lentil. Village Chakral, District Chakwal, Punjab Site 2. Groundnut. Village Sagarh, District Chakwal Site 3. Chickpea and Lentil, Village Mankera, District Bhakkar, Punjab Site 4. Chickpea. Village Takht Nusrati, District Karak, KPK Site 4. Groundnut Village. Chontra Valley, District Karak, KPK Site 5. Chickpea and Lentil. Village Kubro, District Larkana, Sindh Site 6. Chickpea and Lentil. Village Jafferabad, Distict Jafferabad	Sites to be characterised in terms of agro-ecology and climatic characteristics including recent rainfall patterns. Purpose is to capture interactions between these factors and the data from situation analysis. Analyse and report. Include an evaluation of "novelty": what was well known and what is new or surprising.

1.3	Convene a workshop with the ADP Pulses Policy Project; review and discuss findings of both projects; incorporate the conclusions into the research plan and report.	ADP Pulses Policy Project workshop conducted. Findings disseminated to research team for implementation into research plan	ACIAR Project ADP/2016/140 "Economic analysis of policies affecting pulses in Pakistan" will be presenting policy brief for future discussions based on the three papers presented in Pakistan in 2017. Project Officers and the Project Leader also attended policy forum organized by the ADP/2016/140 policy team in Islamabad and Karachi. The final document is awaited.	No evidence of consideration of the Policy project results, for incorporation into research plan if justified. Team member Ms Saima is also part of the Policy project team and could facilitate the analysis of the Policy project report and its meaning for the Production project: expect a specific output for this.
1.4	A situation analysis will be conducted in the selected areas using a two-step participatory approach as outlined in the methodology. The analysis will derive an understanding of the socio economic environment of participating households from the perspectives of women, men and youth. That examination will include drivers and disincentives for pulse production, develop an annual calendar of events including cropping calendar, seasonal labour demand and limitations, seasonal cash flows (including periods of cash stress), land ownership and control including farm based decisions and policy environment. This process will assist in selection of research farm families.	Situation analysis completed and collated in a report.	First step situational analysis has been conducted successfully with selected farm families at all six selected project sites. Results were analysed and collated in form of report. The second step situational analysis is in progress. During this phase pre-sowing groundnut and postharvest chickpea & lentil situational analysis with individual farm families has been conducted on Site 3 (Bhakkar) and site 4 (Karak). Results are being analysed.	Following activities (1.5 to 1.12) for Objective 1 predicated on the results of this situation analysis, which will also have a major influence on the best options for implementing Objectives 2, 3 and 4. Research team (SSRI and Project Officers) have done a great job of extensive qualitative data collection and farmer engagement. Report was not provided to ACIAR or the review team. To be rectified. The Overview presentation for the Review claimed Results/Achievements from the situation analysis were: "(1) Understood socio-economic situation of project sites from the perspective of women, men and youth, and; (2) Identified major issues related to pulses production". Lots of information discussed relating to (2). The data and/or analysis related to (1) was to have been presented but load shedding prevented this. Include in the analysis and reporting. Information presented in support of claim (2) should be analysed, with the aim to draw conclusions, rather than being presented as datasets Data identified production issues to be researched at each site: learn from comparing and contrasting these localised findings. Findings overlaid with climate, 2017-18 weather and soil data for each site to help assess the likely contribution of each region to future increases in pulse production.

1.5	Refine research objectives and develop replicated agronomic trial plan to address research questions in context of pulses and farm productivity identified in the objective 1. Different agronomic parameters will be assessed at each trial site, such as varieties, sowing time, Rhizobium inoculations, sowing & harvesting technology, crop rotation, an activity to be specifically undertaken in conjunction with CIMMYT and will be supervised by Dr Muhammad Imtiaz.	Trial plan developed	August, 2018 Replicated agronomical trials planned with all representatives of collaborating organization and their affiliated institutes.	Trial plan not provided, not presented, not discussed. The site-specific research objectives were presented in general terms. Specialist expertise to be engaged when necessary to supervise each of the research treatments. There were surprising ambiguities or inconsistencies for example in the utilisation of fungicides, insect attractants, availability (or not) of the proposed inputs, etc. suggesting that technical support may be needed in some cases. The impact pathway of any proposed innovation needs to be analysed over the second phase of the project.
1.6	Conduct farmer led researcher managed variety, yield and quality trials where appropriate (likely to be all selected project areas).	Yield/quality field trials conducted. Data collected, analysed, reported and discussed with farm families for future application.	Chickpea and lentil varietal yield trials were conducted with one farmer at each selected project site during winter (Rabi) season 2017-18. Chickpea trial consisted of 14 improved and approved varieties whereas lentil trial consisted of 4 varieties. The farmers of selected farm families were made to visit the trial twice in the growing season. One at green pod stage and second at time of harvesting. Farmer's preference for different varieties in both chickpea and lentil trials were noted. Later after harvesting, yield data will be shared with the farmers to let them decide the variety of their preference. Groundnut varietal trials were planted in April, 2018 at three project sites (Site1, 2 and 4) and are at seedling stage in June 2018.	More data reported at the meeting. Site 2: not all 15 farmers engaged in 17-18, some trials just started in 18-19. Variation to plans are quite understandable at this stage of the project. Site 4: despite the claimed participatory design of experiments, farmers did not establish the 17-18 trials themselves and required project staff (from Karak research station) to perform the field work. It is unclear how this situation will evolve in 18-19. No reported analysis about this issue, why site 4 is different from other sites in this regard, and what to do about it. Site 6 experiments substantially failed for 17-18. Understandable considering the difficulty in communication and interaction with Balochistan. Lessons are being learned and the team is confident that season 18-19 will provide useful data.
1.7	Farmer led replicated trials to evaluate fungal disease management in the selected project areas (likely to be in all selected project areas).	Disease management field trials conducted	October, 2018 Trials sown	Concerns about the proposed use of Benlate as a seed dressing, given its non-availability. Thiophanate-methyl is closely related to Benlate and is very old chemistry with questionable efficacy. The candidate treatments should be reviewed by local experts.

1.8	Farmer led trials to evaluate weed management in the selected project areas. The weed management activities may vary between selected sites due the prevalent weed species at each site. However, it is likely trials will be undertaken at all selected project areas and will also involve local service providers.	Data collected, analysed, reported and discussed with farm families for future application.	October, 2018 Trials sown	No description provided. Topic of high interest to some farmers. Need to think laterally, beyond herbicides, for possible context-specific solutions. Link with PSPD. Facilitate trait evaluation and transfer of the Australian Lentil with herbicide tolerance (which gene? Clearfield?).
1.9	Farmer led rhizobium inoculation trials in all selected project areas (likely to be in all selected project areas). Rhizobia inoculants both from Australia (granular inoculants) and Pakistan (Slurry based) will be tested at all selected areas.	Weed management field trials conducted	October, 2018 Trials sown	Who would produce and sell the inoculants if benefits are established)? New controversial bioactive fertiliser product. Link with PSPD.
1.10	Farmer led demonstration machinery trials where appropriate (likely to be in all selected project areas). These trials will also involve, where appropriate, local service providers (for planting and harvesting services), local machinery suppliers and local seed producers.	Data collected, analysed, reported and discussed with farm families for future application.	October, 2018 Trials sown	Improved groundnut harvester? Link with PSPD.
1.11	Farmer led plant nutrition trials where appropriate (target of at least two of the selected project areas).	Plant nutrition trials conducted (target of two trials). Data collected, analysed, reported and discussed with farmers for future application.		Soil health evaluation to detect improvement?
1.12	In association with research farm families carry out economic analysis to determine profitability of each adopted innovation. The inputs and outputs as well as the resources (such as labour) to be included in the analysis to be determined in association with the research farm families.	Farm machinery trials conducted. Data collected, analysed, reported and discussed with farmers for future application.	Groundnut trials have been harvested and Project team to complete	Only report on groundnut harvesting trials was through discussion with farmers, explaining the limitations of existing machinery (loss of 30% of grains). Opportunity for improvement of machinery? Link with PSPD MegaProgram?

Objective 2: Increase opportunities for farmers to undertake postharvest value addition to chickpea, lentil and groundnut crops

No.	Activity	Outputs/milestones	What has been achieved?	Comments
2.1	Determine current processing and marketing activities and capacity of the community to expand those activities	Outline current processing, marketing and capacity of community	Based on the situational analysis, a site specific report has been prepared outlining current state of value addition and processing to chickpea, lentil and groundnut in 6 projects sites.	No evidence of market analysis. Need not be complicated. Local expertise in partner Universities can be engaged.
2.2	Introduce and evaluate the options in post-harvest value addition that are available through a workshop for Research Farm Families and other participants.	Evaluate options for post-harvest value-addition	Industry visits and workshops on value addition will be held over the next 6 months.	In planning stage. Market analysis required.
2.3	Develop value addition demonstration projects in association with farming communities. This activity will be coordinated by Dr Asgar Farhanaky with the support of Professor Chris Blanchard. Additional assistance will be sought from CFTRI in India who have developed a range of small scale pulse processing equipment suitable for this project.	Design of value addition projects at each site	A Situational analysis survey has been conducted and the current situation of value addition to chickpea, lentil and groundnut has been studied. As a result an strategy plan for value addition has been developed taking into account the findings of the situational analysis and brain storming activities. Value addition focused meetings have been held with Pakistan research partners. The value addition draft plan will be discussed/finalised with Pakistan research partners in a face to face meeting in Nov 2018 in Pakistan.	Issue of food safety for peanuts: farmers are aware and believe that good post-harvest drying is sufficient. Should the project validate this assumption? Low-tech inexpensive aflatoxin strip test from University of Sydney could be tried as was done by project AI-Com in Timor Leste. Or private sector link to address this? It is likely that private companies will want to find out.
2.4	Develop the capacity of participants in techniques relevant to value adding demonstration projects designed in Activity 3.	Capacity building activities completed to enable participants to engage in at least 6 value addition projects	Meetings with PMAS University and NARC researchers have been held, aiming to start 6 value addition projects in which MSc research students are to be engaged to develop adequate technical knowledge for practical value addition opportunities at small scale (farm level).	
2.5	Conduct value addition projects with a target of at least one value addition demonstration project per site will be set.	A minimum of 6 value addition projects completed	Small scale value addition opportunities have been identified.	These value addition projects are in the planning stage.

2.6	Engage private sector companies in two workshops to evaluate the opportunity for a peanut oil industry, that sources product from small-scale producers, to operate at the national level.	Two workshops with edible oil manufacturer completed	The workshops will be organized after the completion of the groundnut situational analysis currently in progress. The project is already involved in discussions with the Waheed Group of Companies who are the market leaders in edible oil industry in Pakistan.	A clear business case should be established for potential value-adding interventions. For example, some basic market analysis on the vegetable oils market should be undertaken to define the market opportunity for peanut oil. (in the context of the reported cartel behaviour of much of the imported oils sector).

Objective 3: Develop and evaluate, in partnership with farmers, site specific village-based seed production and dissemination systems to facilitate access to improved varieties.

No.	Activity	Outputs/milestones	What has been achieved?	Comments
3.1	Identify in each experimental village 1-2 suitable seed producing farmers for recommended varieties.	A minimum of 1 seed producing farmer selected in each selected village		Met groundnut seed producers at Site 2, very enthusiastic, placing their confidence in BARI Chakwal.
3.2	Identify in each experimental village 1-2 suitable seed producing farmers for recommended varieties.	A minimum of 1 improved variety of 3 crops are produced in the selected villages		The crop was harvested by groundnut harvester but the performance of that harvester is not so good and needs improvement to save harvesting loss up to 30%.
3.3	Communicate to the local communities the availability of locally produced seed via extension workers and NGOs. Make recommendations to policy makers regarding the viability of seed certification system.	In association with other dissemination activities 6 campaigns of communication completed, (eg field days) and at least 1 printed promotional tool produced to promote the seed production system.		One seed farmer reported a field day with 200 participants who could see the new varieties and also purchase the seed of new varieties from the host farmer The host farmer graded the seed with family labour and good grade seed has been sold as seed crop @ (Pak.Rs.7000/40 kg seed) and second grade is sold in the local market@ (Pak. Rs.5000/40 kg seed). The total seed has been sold up to now.

Objective 4: • Disseminate the learning and practices from the project activities to other farmers and private sector participants such as input suppliers and potential service providers

No.	Activity	Outputs/milestones	What has been achieved?	Comments
4.1	Train Research Farming Families in communicating their learning and in facilitating the learning of FFS participants in culturally appropriate ways. This will be carried out over the first three FFS.	Train at least two research farming families from each site in communication and facilitation of learning for modified Farmer Field Schools.		No longer Farmer Field School. Training plan would be useful (who, what, how and how much), to facilitate the monitoring of the activity and the evaluation of its outcome. Indirect evidence of outcomes (changed behaviour, farmers stories, purchasing new goods and services, etc.) would be useful.

4.2	Farmer Field Schools established and first activity completed and evaluation of process carried out.	Modified Farmer Field Schools established and first activity completed at least four sites		
4.3	Engage private sector participants in activities around the Farmer Field Schools.	Modified Farmer Field Schools include an expanded group of participants including private sector participants, universities and government departments		
4.4	The impact of the Farmer Field Schools and related research activities and results validated through examination of the practice of farmers in neighbouring communities.	Evaluation of the impact of modified Farmer Field Schools on the practice of non-supported farmers in neighbouring communities		Collaborations with other projects to reconsider the former lentil area of Sialkot. Could start with low-cost initial awareness activities.