

Newsletter of the ACIAR Pakistan profitable pulse project - CIM/2015/041

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PULSE

In this issue

- From the project leader
- The Pakistan Pulses Industry Development Strategy collaborating across project to develop an initial consultation draft
- Poverty and its significance on our farmers
- Smart irrigation system saviour of the souls of Thal

From the project leader



Welcome readers.

Very few would argue that the year 2020 brought us challenges that we could not have foreseen at the beginning of the year. Under these testing times, hundreds of businesses collapsed; some survived while few thrived. During these times, our entire project team activities proved to be a success story, adapting to the situations that made them rise to the occasion. From adhering to new communication protocols, the team has made us proud with their commitment to delivering smiles to hundreds of farmers by providing them a reason to continue pulse farming for increased productivity and profitability. This issue highlights some of their achievements and aspirations that have impacted the way farmers will conduct their business in the future.

Dr Ata-ur Rehman **Charles Sturt University**

























The Pakistan Pulses Industry Development Strategy – collaborating across project to develop an initial consultation draft

Dr Liz Petersen ^a, ^b Dr Arshed Bashir, ^c Dr Mubashir Medhi ^c, and Dr Rajendra Adhikari ^a ^a University of Queensland ^b Pakistan Agriculture Research Council ^c University of Agriculture Faisalabad.

The new ACIAR project 'Developing competitive and inclusive value chains of pulses in Pakistan' (ADP/2017/004) commenced activities in January this year. The overall aim of the project is to support development of socially inclusive and competitive value chains of chickpeas, lentils and mungbeans in Punjab and Sindh, with spillover effects in Khyber Pakhtunkhwa. The project contributes to the broader overarching goal of ACIAR's Agriculture Value Chain Collaborative Research (AVCCR) program to benefit rural poor, particularly women living in Punjab and Sindh significantly and equitably from improvements in strategic value chains.

One of the first activities of our project is to support the development a Pulses Industry Development Strategy. Initial work has started on this Strategy development process drawing heavily on work prepared by the ACIAR Pakistan profitable pulses project – CIM/2015/041, especially the situational analysis on constraints and opportunities for chickpea and lentil production in Pakistan. The situational analysis provided an evidence-based foundation on which the Strategy is being developed.

Domestic demand for pulses in Pakistan has been steadily increasing since the 1960s (the start of available consumption data). In 2017, Pakistan was the 13th largest consumer of pulses in the world, consuming a total of 1.4 million tonnes, equating to 6.6kg/capita. However, pulses are a minor crop in Pakistan in terms of production, grown on only 5% of cropped area. In 2018/19, Pakistan produced 569,000 tonnes of pulses on 1.1 million hectares of land. The main pulse crop in Pakistan is gram (chickpeas), which accounts for almost 80% of production.

Over the last 50 years, production of pulses has decreased by 37% with most of this decline occurring since 2007. This decline in production is caused by a decline in both area planted and yields. This trend is the opposite to that of the major crops grown in Pakistan, all of which have increased in yield, area and production over the last 50 years. As a result of this decline in pulse production, imports have risen dramatically in recent years. Approximately 40% of consumption is met through production, the remaining 60% is imported. In 2017, Pakistan was the fourth largest importer of pulses in the world.

The aim of this activity is to develop a roadmap to reverse the declining trend in pulse productivity in Pakistan, and to develop a competitive, adaptable, inclusive and sustainable pulses sector. A brief outline of initial work on the Strategy is presented here. The process for developing the Strategy is open and consultative, with anyone involved in the pulses sector in Pakistan encouraged to provide comments.

Outline of the draft Pakistan Pulses Industry Development Strategy

Draft-for-Discussion Vision: A competitive, adaptable, inclusive and sustainable pulses sector contributing to the socio-economic well-being of all members of the pulses value chain and contributing to development of the national economy.

Draft-for-Discussion Strategic Objectives: There are three

inter-connected strategic objectives considered necessary to realise this vision.

Strategic Objective 1: Increase productivity in Pakistan's pulses sector through increasing yields and capitalising on opportunities for intercropping and between-season sowing

Potential actions for achieving Strategic Objective 1 include: (1) modernisation of the seed sector, and (2) developing capacity in participatory extension processes.

Strategic Objective 2: Develop the pulses value chain to improve linkages, capabilities, information flows and distribution of value between all value chain participants



¹Rani, S., Hussain, I., Riaz, S., Rehman, A., Ramsay, G., and Manan, A. 2019. Discussion Paper: Constraints and opportunities for chickpea and lentil production in Pakistan – A situational analysis.

Potential actions for achieving Strategic Objective 2 include: (1) linking small and medium-sized enterprises to the market, (2) increasing capacity in market forecasting and understanding consumer value, (3) developing a national set of quality standards, (4) setting up a standardised system for testing pulses, (5) conducting feasibility studies into processing and other pulse value-adding activities, (6) holding annual crop outlook conferences, and (7) encouraging opportunities for contract farming and cooperatives.

Strategic Objective 3: Strengthen the policy and institutional environment to increase the competitiveness of pulses production

Potential actions for achieving Strategic Objective 3 include: (1) evidence-based decision support to government on critical policy issues such as the export ban on pulses, price support to other crops such as wheat, fertiliser and electricity subsidies etc., (2) increase funding in research, development, extension and adoption for pulses, and (3) encourage industry leadership and funding to support development of the pulses sector.

If you would like a full copy of the draft Pulses Industry Development Strategy, and to provide any comments, please contact:

- Dr Liz Petersen liz.petersen@uq.edu.au
- Dr Arshed Bashir arshadparc@gmail.com
- Dr Mubashir Medhi mubashir_mehdi@hotmail.com
- Project Leader, Dr Rajendra Adhikari r.adhikari@uq.edu.au





Poverty and its significance on our farmers

By Dr. Umair Waqas, Project Officer, MNSUAM, Multan

The ACIAR pulses project is one of its kind, attempting to use multi-disciplinary approaches to address issues faced by farming communities. The basic goal of the project is to help Pakistan reverse the trend in decline of the country's pulse production, mainly through farmer led research and demonstrations. The consistent gap between production and consumption of pulses has led Pakistan to consistently import them for many years. This is not only causing a burden on the country's foreign reserves, but declining opportunity on the many benefits that pulses bring to the farming system including nutritional security, soil health, disease control and risk reduction.

As a result, there is a dire need to provide incentives for the pulse growers to increase crop production by implementing planned agronomic interventions, availability of improved seed and use of modern agricultural technologies. The project has been playing its role to address all these issues and provide some comfort to the farmers. The recently conducted social analysis has revealed the importance of addressing the social factors that halt the farmers from paying full attention to their agriculture. In this regard poverty has been singled out as a multidimensional factor that prevents farmers from using the modern technologies in the field of agriculture. Moreover, poverty is being experienced differently across time, space, culture and even gender. In the experience of some farmers, poverty is most severe during specific seasons, while remaining static at other times. Consequently, it prevents them from getting a better education for their family, therefore the vicious cycle of poverty continues. In addition, any sudden long-term disease makes their life choices more limited and tough. Poverty, coupled with a lack of education, is a major hurdle in understanding the recent developments in the field of agriculture, and forces them to stick with the old conventional methods. The analysis also showed how change in population, markets, technologies, policies, institutions and information flows are simultaneously placing new pressures on, and opening new opportunities for, the smallholder farming community. Where land is available, population growth and

market demand are fueling an expansion of the cultivated area, although not always into areas appropriate for sustainable agriculture. In most places, however, land is scarce and incentives for good resource management are absent; soils are being depleted, holdings are shrinking and farmers are sliding deeper into poverty. Increasingly, farm families are being forced to resort to seasonal, and ultimately permanent, migration in search of alternative livelihoods. On the other hand, where support structures exist and policies promote effective resource management, small farmers are successfully intensifying and diversifying production, enhancing their resource base and increasing off-farm income through family employment in local agro-industries.

However, in this project our GCR (Groups of Collaborative Research) farmers have adopted the modern way of growing pulses and witnessed the improved yield of pulses. Most GCR farmers, in their interviews, have revealed that they have learnt many new things in relation to sowing and harvesting of pulses that has had a significant impact on their yield. For example, one of the farmers said, "the treatment of seed with rhizobium is a new thing for us and it has improved our pulse production per acre. That in turn has improved our income and has equipped us with better means to counter any sudden tragic events". The key driver for increasing agricultural productivity and rising incomes is the adoption of innovative technologies and practices by farmers. This will enable farmers to raise yields, manage inputs more efficiently, adopt new crops and production systems, improve the quality of their products, conserve natural resources, and adapt to climate challenges. However, pure good quality seed at cost effective rates remains the core element in achieving a profitable yield.

Embedded with a wealth of elements in the form of good genes, the seed plays an important role in agriculture and if deployed properly can ensure sustained productivity. It is established that timely availability of tried and tested quality seed of improved varieties in adequate

quantities decides the strength and health of the agricultural economy. However, deployment of pulse crops in Pakistan, termed unfortunately as an orphaned crop, on a massive scale cannot be realized until the quality seed is available equally for both big and small land holders. In this regard, an additional initiative was taken by the project by introducing the concept of production and marketing of certified seed entrepreneurship at farmer level. As many as 10 farmers at site 3 (Bhakkar) have shown interest in starting their own seed company on a small level, and the project will provide them with basic support. The idea originated from the lap of the village-based seed system where farmers formally or informally exchange their seed of improved varieties with fellow farmers. The project is taking it another step where a farmer will be taught how to clean, secure, grade, pack and sell or exchange the quality seed to earn optimum profit. At an early developmental stage this initiative has great potential for not only alleviating poverty at farmer level but ensuring the availability of the newly released seed of improved pulse varieties across all the pulse growing areas of the country. Like many entrepreneurs, the seed business success is not guaranteed but it does offer a possible pathway out of poverty.





Smart irrigation system – saviour of the souls of Thal

By Dr Qasim Bhatti, Farmer, Multan and Dr Ata-ur Rehman, Project leader, ACIAR Pulses Project

The Thal region in the province of Punjab contributes almost 80% of the total chickpea production in Pakistan. Its soils range from clay to sandy loams but are mostly pure sand dunes. These poor soil types cause low chickpea yields and create crop uncertainty which is the major constraint for the adoption of new techniques to improve chickpea yield. Some of the potential interventions that could enhance the productivity of the farming system are irrigation, soil improvement techniques and the use of disease resistant varieties. These three important interventions could revolutionize crop productivity and profitability, and in turn lead to improved infrastructure and more secure livelihoods for communities in the Thal region. Sustainability of the chickpea crop production is of paramount importance in the Thal region as it is the sole winter crop grown in this region, averaging a per hectare yield of 370kgs. The failure of the chickpea crop in this region has the potential to adversely affect both humans and livestock, as the chickpea straw is the main source of protein for livestock.

Water availability is a critical aspect of any farming system. Like many other rainfed areas, the Thal region frequently experiences a shortage in rainfall required for successful crop production. This deficiency in moisture appears to be increasing, possibly due to climatic changes.

Provision of irrigation for increased productivity exists, but large and expensive irrigation systems are not a viable option for the majority of the area's farmers who tend to have land holdings of 10 acres or less. Farming land is uneven, making it impossible to irrigate paddocks with simple tube wells and waterways. The sandy nature of the soil with low water retention capacity makes it vulnerable to the high cost of irrigation. Even though the chickpea crop water requirements are minimal, absence of rainfall at the required stage of growth could jeopardize potential yield by a big margin.

An inexpensive solar powered rain pipe system as a backup can be a solution to irrigate small landholdings, providing a consistent promise of enhanced yield. Fortunately, the Thal region is blessed with an ample source of high-quality underground water available at a depth of around 15 feet. Recovery of this water can be simply achieved by making a 7-10cm bore, installation of 1 or 1/2 HP submersible or centrifugal DC pump and a solar panel of 150 - 300 watts to operate the pump to feed water in the system. This closed pipe system comprising of one main line joined to lateral lines with a unique arrangement of holes can irrigate the whole acre. In this way, a 6-hectare area around the pump can be irrigated, with the same machine reducing further installation costs.



150-watt solar panel on centrifugal pump

While access to fresh water for irrigation can generate income and increased food security, it can also potentially create an imbalance between water supply and demand. Furthermore, increased water use may also encourage farmers to use more fertilizers, insecticides and fungicides. It is therefore very important that in order to make farmers use water efficiently, actions at government level are urgently required before irresponsible water and agricultural chemical use not only causes underground reservoirs to become contaminated, but a reduction in their water levels.







Closed pipe irrigation system.



According to Dr Qasim, the decision to install this irrigation system has been extremely successful and satisfying. This didn't come as an inspired choice, but from years of learning from his mistakes and asking the right questions from the right people at the right time. In this regard, learning experientially while working with the researchers of the Australian Centre for International Agriculture (ACIAR) funded project on pulses has been rewarding. Dr Qasim has used quality seed of improved chickpea varieties, and the plants have shown vigorous growth, with a yield three times higher and improved quality of grains in size, colour and shape. Grain size was increased with the 100 grains weight improved from 22 to 28 grams. In the absence of any formal access to certified seed, these lots of pure seeded grains have been in great demand, attracting higher prices as a varietal seed and as a product for routine consumption. With irrigation came more biomass of the chickpea plants, eventuating into ample protein-rich straw for cattle and small ruminants.

Obvious benefits this simple machine has brought are innumerable, including increased biomass translating into improved soil, enhanced yield and grain quality, with the potential of crop rotation and sowing of more crops per year. This in turn will potentially reduce the risk of soil borne and other fungal diseases. Summer vegetables and even autumn chickpea crops (as established in Australia lately) could be a part of the system providing more grazing matter for livestock to further enhance the productivity and profitability of small farm holders. Livestock can be maintained by producing fodders like Rhodes grass and Napier CO5 grass etc. which are more productive because of their adaptability in the area and high yielding capacity. Furthermore, since irrigating the crops is generally a man's job in agriculture in Pakistan, this system will increase the role of women in crop management, even as independent growers, because of the user-friendly nature of this system.

It is now a well-established fact that good quality environmentally adapted varietal seed and nutritional balanced soils are the key to sustainable agricultural yields translating in turn to financial benefits. Use of a solar powered rain pipe system can not only deliver improved soil health and productivity but also an array of benefits for farmers at the household level. Animal dung is the best source of organic matter, macro nutrients and micronutrients. However, availability of massive amounts of organic fodder in the form of wood chippings from trees and postharvest crop residues, entrenched with necessary elements such as potassium, phosphorous, gibberellic acid etc. for grazing animals and composting can only be visualized by the availability of water. Moreover, wood ash from burning fallen tree branches and crop leftovers can be an excellent and cheap source of potassium for the crops. In other words, the small intervention of deploying this simple but effective watering system would not only revolutionize the area's farming system and increase crop productivity but will also alleviate the poverty level of small landholders.

Contact us

aciar.gov.au/project/CIM/2015/041

Graham Centre for Agricultural Innovation

Phone: +61 2 6933 4400 Web: grahamcentre.net Email: grahamcentre@csu.edu.au

Dr Ata-ur Rehman, Project Leader, Charles Sturt University: arehman@csu.edu.au Dr Shahid Riaz Malik, Project Leader In-Country, PARC: shahriz5@yahoo.com



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