

Agriculture Value Chain Collaborative Research Program (AVCCR)

Product Value Chain Assessments

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1.0 Introduction

A common feature of international aid programs is the adoption of value chain approaches to promoting market orientated growth, reducing poverty and empowering women. The Agricultural Value Chain Collaborative Research (AVCCR) program being developed by ACIAR proposes such an approach to research for development in Pakistan.

The goal of the AVCCR program is to significantly improve the economic and social performance of selected pro-poor agricultural value chains in Pakistan. The guiding principles of the AVCCR program are that:

- The selected value chains must involve large numbers of pro-poor households
- The selected value chains must offer opportunities for the empowerment of women
- The research must involve the identification of critical production, post-harvest and market access constraints that can be solved through adaptive and applied research that unlock the potential of these value chains
- The research must prove the industry relevance and success of the interventions proposed
- The research must be multi-disciplinary and collaborative
- The research must involve the private sector
- The research must engage and respond to the needs of Pakistan partners.

To guide ACIAR in the selection of a small number of value chains with the most potential to promote economic growth, link large numbers of rural poor to markets and empower women in those chains, a value chain assessment of nine short-listed chains has been commissioned. This report presents those eight assessments.

In conducting these assessments and in particular in identifying researchable issues, we were guided by the conclusions of Humphrey and Navas-Aleman (2010)¹ from their review of 30 value chain interventions funded by a range of donor organizations. They concluded that while interventions were often effective in promoting market orientated growth there was little evidence of their direct impact on poverty reduction. They identified two points salient to the analysis in this report:

1. Most opportunities for poverty reduction come from the development of niche markets for raw or minimally processed products, and
2. The poor struggle to gain market access because of a lack of knowledge of such opportunities, the market requirements associated with such opportunities or a mismatch between the market requirements and their capabilities to meet these requirements.

We conclude that a participatory research approach involving smallholders and their communities will enhance the likelihood of AVCCR interventions having an impact on

¹ Humphrey, J., and Navas-Aleman, L., 2010. *Value chains, donor interventions and poverty, reduction: a review of donor practice*, Vol 10. Institute of Development Studies.

poverty reduction. Such an approach is needed to identify market opportunities, develop appropriate skills and carry out the processes to capture these opportunities. A similar approach has been adopted with success in the Baluchistan Agricultural Project (Farmer Marketing Collectives) and PARDI (Participant Guarantee System) Project in the Pacific. Success in the AVCCR program will require that projects have a farm-to-consumer focus, are underpinned by detailed baseline research, have experienced facilitators who can guide this process, and involve on-going impact assessment.

2.0 Cross-cutting issues

In applying assessment criteria to the chains being analysed, it became clear that there were cross-cutting issues common to many of them. They are presented here so as to avoid repetition in the presentations of individual chain analyses.

Strategic alignment

The AVCCR footprint will be in Punjab and Sindh provinces, but for chains where KPK or Baluchistan contain major production areas or markets, managing the spillover benefits to those provinces will require special attention.

Private sector engagement

Across all chains, difficulties are foreseen in identifying private sector collaborators willing to co-invest in projects. Since 2007 this has been an on-going challenge for projects under ASLP, the forerunner of the AVCCR program.

Risks

The security limitations imposed on field work, inability of Australian team members to work in KPK or Baluchistan, and restrictions on accommodation and travel in rural and remote areas areas of Punjab and Sindh, will impact on project design and execution across all chains being analysed.

Risks associated with natural disasters such as floods, drought and frost are common to most chains. Major flooding in Punjab and Sindh is likely within the lifespan of the AVCCR program.

Vested interests at all levels of the commercial value chain and among its public and private sector stakeholders will impact on projects. These impacts can be mediated through careful stakeholder selection and engagement, and they need to be actively managed throughout the life of any project.

Women's empowerment

As all chains must address women's issues, ensuring that project teams themselves contain female membership wherever possible should be a guiding principle.

Drivers of demand

Drivers of demand for all five vegetables (onion, potato, garlic, chilli, tomatoes) have much in common, including increasing demand for vegetables in general, increasing consumption on special occasions such as Ramadan, the impact of fast food outlets on demand for vegetables, and opportunities to use local production to replace imports.

Researchable issues

Because AVCCR has a special focus on smallholders, in all chains there is a need for research to identify effective forms of collective action among smallholders and a need for improved business management skills. This need is consistent with the Federal Government's current initiative to encourage farmer clusters (GoP Agriculture Division, 2015).

All chains have a need for baseline research to establish women's involvement and the financial performance of smallholders.

3.0 An emerging pattern of response

Through the analysis of all nine chains a common pattern of response to the circumstances facing each chain emerged. This pattern is described here because, if validated, it may point to a modified process by which to choose those chains that are funded under the AVCCR program. At the very least it will inform the choice of projects differently than may have been intended.

The emerging pattern is a response to the guiding principles of this analysis – that projects must focus on benefits to smallholders and women; that researchable issues should be cast in a whole of chain context; and that projects should involve collaboration, particularly involving the private sector. The common pattern in this analysis can be described as follows:

1. Smallholder operations usually involve the whole family and women play a major role in many industries. Smallholders cannot be treated separately from their families.
2. Smallholders have greater ability to improve productivity, quality and market-defined product attributes collectively than they do individually
3. Collective action by smallholders can give them greater bargaining power in markets where traditionally they are powerless against middlemen, to whom they are often tied by credit arrangements
4. Collectively producing and marketing a product based on better knowledge of consumer demand in practice means working as a value chain, and in traditional systems this means finding like-minded middlemen and processors with whom smallholders can work to create and deliver greater consumer value.
5. Unlocking the potential to work in this way involves research into technical, financial, managerial and social dimensions of the opportunity.

It is not clear whether this stream of logic was already well understood and underpinned the request for this analysis to be undertaken. If it was understood, then the above points make

that understanding explicit. If it was not understood, then these points indicate a pattern common to all chains that may guide project selection, design and execution.

VALUE CHAIN ASSESSMENT OF PULSES

CHAIN SUMMARY

Pulses are the most important form of vegetable protein in Pakistan, occupying 5% of the total cropped area. The main pulses are lentils and chick pea. Because they compete with wheat, rice and cotton, pulses receive relatively less government attention, in spite of the fact that 80% of national lentil requirements are imported. About 70% of pulses are further processed. Weed management, blight control and threshing technology are researchable issues which could have high impact for smallholders. Collective action and direct dealing with processors may enable technical improvements to flow through to improved household incomes. Pulses scored highly at equal rank three and are recommended for consideration as an AVCCR project.

CHAIN CHARACTERISATION

WHAT ARE THE KEY FEATURES, DRIVERS, INHIBITORS AND POTENTIALS OF THIS CHAIN?

Pulses are considered as 'meat' for commoners and the poor. Lentils and chick peas, the most important pulses in Pakistan, are grown in low rainfall regions and can tolerate poor soil conditions. Smallholders with 2-10ha contribute 90-95% of production. There is little evidence of technology-based improvement in pulse crops because they compete with mainstream crops such as rice, wheat and cotton and therefore receive less research and development attention. Pulse crops are highly affected by unusually heavy rain and extremes of climate, thus farmers regard them as riskier crops, though they can be quite profitable. About 70% of pulse production is processed into broken and ground forms. The main producing regions are in drier parts of Punjab, which contribute more than 60% and 89% of national lentil and chick pea production respectively (Tables 1 and 2).

Table 1: Production of lentils in Pakistan 2000 - 2013

	Punjab	Sindh	KPK	Baluchistan	Pakistan
Harvest season	Early sowing starts in October and harvesting season extends from march 15 to march 31				
Production area ('000ha) average 2000-2013	Decrease (4.7%) 22	Decrease (8.2%) 6	Decrease (2.8%) 4.8	Stable 2.6	Decrease (5.6%) 35.5
Production volume ('000t) average 2000-2013	Decrease (5.4%) 12	Decrease (7.1%) 3.4	Increase (5.5%) 2.5	Slight decrease (o.1%) 1.7	Decrease (5.2%) 19.5
Average yield (kgs/ha) 2000-2013	Decrease (2.3%) 506.4	Slight increase (0.8%)	Good increase (9.2%) 531.7	Slight decrease (0.2%)	Slight decrease (0.1%)

		582		627.2	537.8
Area % 2000-2013	61.2	16.5	14.1	8.2	100
Production % 2000-2013	57.5	18.1	14.5	9.8	100

Source: Agricultural Statistics of Pakistan 2012-13; authors calculations (Value of Production data are given in appendix)

Lentils are grown on about 35,000ha with a value of production of USD6-10 million. Average lentil yield (549kg/ha) is well below world (923kg) and Asian (792kg) averages. Both area and production of lentils decreased by around 5% from 2000-2013, attributed to poor cultural practices (especially weed management), droughts and heavy rainfall events. Demand for lentils is greater than domestic supply and is met with the imports. From 2000-2011 about 80 percent of consumption was met by the imports, a contrast with chickpeas where 89% of consumption was met by domestic supply. While lentil production decreased by about 5% over the period 2000-2013, chick pea yields (+18%) and production (+17%) showed positive growth. Sindh has the highest yield per hectare of chick peas of about 928kg (higher than world and Asian averages), followed by Baluchistan with 829 kg/ha (equal to world and higher than Asian averages).

Table 2: Production of Chickpeas in Pakistan 2000 - 2013

	Punjab	Sindh	KPK	Baluchistan	Pakistan
Harvest season					
Production area (‘000ha) average 2000-2013	Increase (1.3%) 907.3	Decrease (5.8%) 39.6	Decrease (2.4%) 45.5	Increase (13%) 28.2	Slight increase (0.8%) 1020.5
Production volume (‘000t) average 2000-2013	Strong increase (24%) 502	Decrease (4%) 36.3	Good increase (12.3%) 18.4	Good increase (13%) 23.4	Good increase (18.4%) 580
Average yield (Kgs/ha) 2000-2013	Strong increase (22%) 552	Increase (1.5%) 927.7	Good increase (13.5%) 417	Stable 826.8	Good Increase (17.2%) 565.8
Area % 2000-2013	88.9	3.9	4.5	2.7	100
Production % 2000-2013	85.7	6.7	3.3	4.4	100

Traders are the main buyers of the lentil from producers, selling 70% to processors and 30% to wholesalers in the grain markets and large shopkeepers in cities. The product flow for chick peas is the same as for lentils, in which village traders play a critical role, and to whom smallholders are often tied by credit (some traders were said to start rumors of a bumper crop in order to pay low prices to growers). Two types of chick peas, Desi Chana (Black) and

Kabli Chane (White), are distinguished by their characteristic taste and size. Desi Channa is widely used in salad, Samosa and other homemade food.

A limitation to chick pea production is Ascochyta blight, which is managed by the use of resistant varieties. Grower informants said that local varieties had been resistant to Ascochyta blight for the last two decades, but from 2014 this disease had returned - this needs further investigation. Wind storms and heavy rains can also severely reduce productivity.

A second limitation is harvesting technology and postharvest losses. Poor threshing technology has been blamed for losses of 20-25%, especially on uneven land. There is also an absence of government policy to encourage local production of pulses.

Consumption of pulses is higher during summer, Ramazan, Eid, Moharram and other local festive occasions. Domestic consumption totals about 600,000 tonnes annually. Imported peas serve as a substitute for desi chickpeas. About 85 per cent of pulses are sold through commercial marketing channels while the balance is kept by farmers for household consumption and planting as seed.

The production of chick pea is constrained by factors including the non-availability of certified seed, lack of improved varieties, lack of irrigation, high transport charges, poor marketing information and low procurement prices.

With no significant innovation in pulses, supplies have lagged behind demand and prices have increased.

Average shares of consumer value for pulses are growers 55-60%, traders 5 %, commission agent 5%, wholesaler 5-10% and retailer 15-20%.

Drivers of Demand

- Tradition: lentils and chickpeas are an expected component of Pakistani diet, particularly for low income groups. Demand varies across income groups with high consumption in low income groups and low consumption in high income groups. However, minimum consumption once or twice a week is common for almost every income group.
- Population and income: As population increases the aggregate demand for lentils and chickpeas is expected to rise, but consumers with higher incomes may turn to other sources of protein such as meat.
- Value addition: There are many value added products as described above such as broken pulses (dalain). Increase in demand for value added products is expected to increase the demand for lentils and chickpeas.

Summary of inhibitors to industry growth

Interviews with industry stakeholders identified the following inhibitors to industry growth:

1. Low productivity: Pakistan's lentil yield per hectare (549kg) is significantly lower than world (923kg) and Asian (792kg) averages. Punjab's yield is even lower although it is the highest producing province.
2. Declining production area of lentils: The production area of lentils is declining in the upper Punjab because of competition from wheat and rice, which have been promoted by government policy.
3. Poor lentil varieties: Traditional varieties have low productivity and are susceptible to fungal disease.
4. Poor harvesting and postharvest practices are responsible for losses of up to 35%.
5. There is little coordination between the apex research organisations, extension bodies and research officials at the local operational level.

STRATEGIC ALIGNMENT

1. The Federal Government has a National Coordinated Pulses Program at NARC with strong involvement in varietal improvement. NARC is an obvious partner in an AVCCR project.
2. The Government of Punjab has been working to improve the productivity of pulses under the umbrella of AARI, thus AARI could be a collaborating partner in an AVCCR pulses project.
3. UAF could collaborate in marketing and value chain research and development.

RESEARCHABLE ISSUES

- Demand and supply:
 - Lentil and chickpeas are Rabi crops that compete with wheat which is a staple food, even though lentil production does not meet domestic demand. Are there demand characteristics for locally produced lentils and chick peas that can be used to motivate greater domestic production? What is the role of the marketing system in affecting returns to growers and what remedies are possible? What are the drivers of improved gross margins for pulses?
 - Can collective action by smallholders form a basis for improving yield, quality and market power? Are there middlemen and processors with whom growers can work to target markets for higher quality pulses?
- Productivity:
 - Harvesting technology research could improve recovery rates and reduce contamination

- Identify and prioritise factors responsible for low yields in Punjab, examining issues such as varieties, seed quality, cultural practices, climatic and water influences.
- Pests and diseases:
 - Verify claims that fungal diseases such as blight have recently reappeared in chick peas after low incidence for 20 years
- Women:
 - More than 70% of lentils and chickpeas are used to make value added products, and women are involved in dhal processing. A baseline study of women's skills and involvement in pulse chains is needed so that opportunities for capacity building and local enterprise development can be identified.

PRO POOR

- The majority of pulse producers have small farms and through collective approaches may have potential to improve yield, reduce harvest losses and improve marketable attributes of their pulse crops. Any of these improvements would have positive livelihood impacts and working collectively may also identify other areas of livelihood improvement, such as development of small scale value adding enterprises, such as making chick pea powder or dhal using small scale processing equipment (www.jasenterprises.com).

PRIVATE SECTOR

Domestically produced pulses are processed by private sector businesses such as Pak Agri Commodities International, Karachi and Younas Dhal Mill, Faisalabad. Any AVCCR project should collaborate with such processors to establish whether any are willing to collaborate in targeting higher value market segments with pulse products sourced from grower collectives. Some may be interested in direct sourcing from growers.

WOMEN'S EMPOWERMENT

Women's roles in pulse farming are limited because of the heavy work involved. There is potential in the value added industry such as in dhal factories, where women are commonly employed. Village scale processing may present opportunities for women.

PARTNERSHIPS

- NARC
- Pulses Research Institute (PRI) Faisalabad, AARI,
- University of Agriculture, Faisalabad
- Punjab Provincial governments in both research and extension, as they are working to improve the productivity of chickpea and lentil

RISKS

The crop is highly susceptible to heavy rainfall and most of the production area falls within the flood danger zone of Punjab, eg Bhakkar and Hyderabad Thal are along the Chanab River which has flooded regularly over the last few years