

Case Study 3.2: Pakistan mango value-chain

BACKGROUND

Although Pakistan is one of the world's largest mango producers, yields are low, farmers are poor, production and postharvest systems are inefficient, practices are unsafe, export performance is low and wastage rates are high. In spite of these issues, the major Pakistan mango varieties have superior consumer attributes, costs of production are low, availability of labour is high and time of harvest is favourable for export markets. This project was conceived as an opportunity to demonstrate how improved postharvest practices, better marketing and value-led chains could satisfy markets while improving farmers' livelihoods. It has been funded by the Australian Centre for International Agricultural research (ACIAR) over the period 2006–15.

RESEARCH APPROACH

Focus: This project focused on the Pakistan mango industry, from harvest through to consumers in domestic and export markets. It collaborated with a second but independent project whose goal was to improve Pakistan mango-production systems up to harvest.

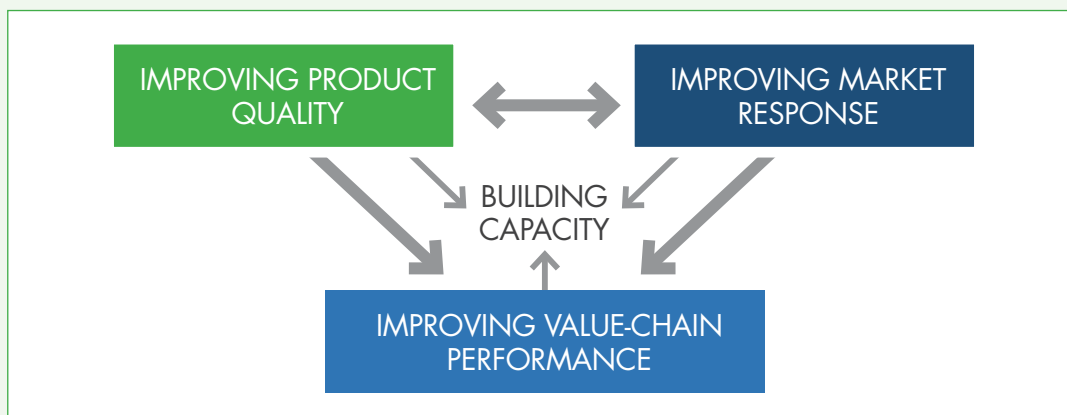
Boundaries: All businesses involved from harvest to consumption were considered within the project's boundaries; thus, a value-chain approach was appropriate. This meant that farmers, collectors, primary and secondary wholesalers, exporters and retailers were targeted by the research. External stakeholders such as extension agents, a government-funded export development company, universities and government departments were also heavily involved.

Scope: The scope of the project was to consider all value-related improvement options, including meeting consumer needs, equitable sharing of value, reducing waste and improving efficiency. Governance relationships were an essential consideration as smallholder growers had little influence on chain activities.

THEORETICAL FRAMEWORK AND METHODOLOGY

The theoretical framework reflected the value-chain nature of the project. Based on value-chain management principles, four integrated areas of RD&E were proposed:

1. to improve product quality;
2. to improve market response;
3. to improve the performance of value-chains; and
4. in each of the other three areas, to build in-country capacity.



PROJECT DESIGN AND FIELDWORK

The project was designed in 2006 through two linked activities. The first was a 2-day workshop in Pakistan with all stakeholders from the industry (about 100) to discuss and document what they saw as the industry's potential and the main barriers to achieving that potential. The workshop produced prioritised lists of researchable topics to be considered for inclusion in the project.

The second activity was a 10-day RVCA by four Australian team members supported by local facilitators. This analysis was based on interviews and field visits involving representatives from every stage of the value-chain, including importers in Singapore as well as external stakeholders such as government officials (Collins et al. 2006).

The project proposal was accepted for funding by ACIAR and research began in 2007.

Initial market research based on intercept surveys of consumers in both domestic and export markets, supported by interviews with importers and retailers, identified consumer value attributes as well as downstream problems in the current state of chains serving each market. Common product attributes valued across most market segments were freedom from blemish and good skin colour.

Research began immediately to map chain processes for different markets and varieties, with special attention to waste and inefficiency. This mapping highlighted opportunities for technical improvements that were within the scope of the project, such as reducing sap burn on the skin of mangoes due to poor harvesting practices. At the same time interviews with wholesalers confirmed their power in the value-chains—upstream they controlled harvesting contractors and thus the prices farmers received, and downstream they controlled such volumes of fruit that small retailers also had little bargaining power. Very little information flowed in either direction that could be used for decision-making. Relationships were based on power.

The project team of five Australians and, at that time, three Pakistanis conducted postharvest fruit quality research at the University of Agriculture Faisalabad. Better quality fruit was test marketed in domestic and export markets to assess its ability to meet consumer value expectations and to quantify its value. Demonstration value-chains were set up among commercial operators who were motivated to be involved. These included growers, retailers and exporters. In general, middlemen were reluctant to become involved.

Extension and training activities consumed a significant proportion of the project's time and resources. Numerous on-farm field days and workshops were held during each harvest

season from May to September. These always included a hands-on component where farmers, contractors and other stakeholders could practise the improved techniques being developed. Simple posters and booklets, in local language where appropriate, were produced and distributed. Pre-season workshops with the main exporters were held annually to provide updates on product quality improvement research and market feedback from the previous season. Government officials, extension workers and other stakeholders were invited to all training and capacity-building activities.

RESOURCES

As mentioned, the project team started with five Australians and three Pakistanis, but by 2013 had expanded to eight Pakistanis, including new expertise in marketing, food technology and strategy/policy. From 2006 to 2015 project funding from ACIAR totalled approximately A\$3.3 million, and significant in-kind contributions were made by both Pakistani and Australian government institutions.

METHODOLOGICAL RECOMMENDATIONS

Demonstration value-chains: The concept of focusing on creating demonstration examples of value-chains has proved its worth. It would be impossible and impractical to thinly spread limited resources across such a huge industry. Concentrating on markets, technologies and people that offer the greatest potential for improvement and the ability to demonstrate how value-chains can work in spite of an industry's problems and barriers has proven an efficient way to focus limited resources.

Cultural challenges: Countries such as Pakistan present cultural challenges for value-chain research by westerners. For example, it can be difficult to apply common research methods such as intercept interviews with consumers—women may make household decisions but men do much of the food shopping. Female research team members must be aware of cultural sensitivities they may not have encountered before, but they provide opportunities to gather data from other women where men could not do so.

EXAMPLES OF VALUE-CHAIN THINKING IN PRACTICE

Collaboration among farmers: In the two major growing areas, groups of mango growers have emerged, brought together by common interests in marketing better quality mangoes, particularly to export markets. These groups market under their own brands, adopt the project's 'best practice' systems, use project market intelligence, and receive technical support and training from project team members. One of these groups, Sindh Mango Growers and Exporters, has used the project's research results and resources to build its own value-chain and has become the first to successfully sea freight Pakistan mangoes under controlled-atmosphere conditions to the European Union (EU).

Consumer orientation: There has been a positive response from domestic consumers to higher quality mangoes sold at higher prices. The traditional view that Pakistani consumers want the cheapest mangoes and will tolerate poor quality to get low prices is not the case in the middle- and upper-income market segments. Here consumers will pay significantly higher prices for quality, sufficient to cover the additional costs of improved production systems. In export markets such as the EU and China this distinction is even greater. Here there are very high margins for high-quality fruit and little interest in anything else.

Improved information: The project produced a wide range of materials for mango growers to improve their postharvest systems. As already mentioned, it also conducted many field days and workshops as a means of communicating with growers and other chain members. On the other hand, market intelligence is generally not available in Pakistan, largely due to control exerted by middlemen. Larger growers who have improved their access to market information through participating in the project's activities have in general adopted value-chain models that allow them to deal directly with retailers and importers for feedback and forward planning. As part of this process they make face-to-face visits with retailers and importers that, over time, will strengthen relationships between them.

Innovation: The project has developed new low-tech harvesting systems that eliminate sap burn, a major cause of quality losses; ripening systems that do not involve dangerous calcium carbide; market entry strategies for China, a new market; long-distance sea freight systems from tree to plate; and confidence in improved systems that allows the development of value-based relationships among growers and with other chain members.

Sustainability: The test of sustainability is whether the project's outcomes become impacts after the project has finished. Early indications are that groups of growers that are focused on building their own value-chains, even one group of poor smallholder growers, will need less and less support from project team members over time. In-country capacity to carry out postharvest and market research without external assistance is well established through the project, so progressive value-chains will have access to local expertise beyond the life of the project.

Value-chain thinking and the future: The Pakistan mango industry will be dominated by hundreds of thousands of poor smallholder growers and powerful middlemen for the foreseeable future. Some things are changing, however. As a direct result of this project, thousands of growers know how to produce higher quality mangoes. Many will do nothing with this knowledge in the short term, but a few are committing to improved growing and postharvest practices combined with a more active involvement in their markets. Through the value-chains they are building they aim to deliver mango quality attributes that consumers want and will pay for, in return for higher prices and/or greater sales. These demonstration value-chains, some breaking new ground such as through sea freight, others very modestly improving their linkages with local markets, will increasingly serve as examples from which others can learn. Pakistan extension agencies and private-sector stakeholders can provide the mechanisms through which the project's benefits could impact a much wider audience.

VALUE-CHAIN PROJECT BENEFITS

Access to higher value markets: The needs of consumers and retailers in China, the EU and high-value segments of domestic markets have been documented and market entry strategies identified. Prices in these markets more than compensate for the extra cost and effort involved, so long as returns are shared equitably with growers. In 2014 'best practice' mangoes were produced by a farmer group at a cost of about 35 Rupees per kilogram (Rs/kg). These were retailed domestically through a supermarket for 109 Rs/kg compared with standard quality mangoes selling for 79 Rs/kg. Sales were rapid. Farmers received 70 Rs/kg for this fruit (a gross margin of 35 Rs/kg) instead of 40–50 Rs/kg for traditionally produced fruit (a gross margin of 20–30 Rs/kg).

Reduced waste: A project study in 2007–08 quantified the losses from harvest to the consumer in domestic mango chains in Pakistan. Across the two main varieties, for every 100 mangoes on the tree at harvest, about 25 reached the consumer (i.e. 75% waste).

Best practice systems developed by the project have reduced this to 10–20% depending on seasonal conditions, as high temperatures and strong winds are common during the harvest season. Other main causes of waste were the high disease load of fruit at harvest, poor transport and packaging systems, and poor temperature management. Each of these factors has been successfully addressed by project research, and management approaches have been developed and demonstrated to growers and other chain members, and documented in printed material distributed to the industry.

Reduced costs: In reducing waste, cost per unit sold has been reduced. Some improvements involve little or no extra cost, such as sap-burn management. Others such as sprays for disease control add to costs, but at a rate less than the value of product saved, even at traditional market prices. Costs to retailers through less wastage from disease and breakdown also improve their returns.

REFERENCE

Collins R., Dunne A., Campbell J. and Johnson P. 2006. A constraints analysis of mango supply chain improvement in Pakistan. Australian Centre for International Agricultural Research: Canberra, ACT, Australia.

Case Study 3.3: Peri-urban vegetable value-chains in Nairobi, Kenya

BACKGROUND

Rapid urbanisation in developing countries has intensified the role of peri-urban agriculture in providing cheap food, employment and livelihoods to small-scale farmers and traders. About 25% of Nairobi's fresh vegetables come from peri-urban chains that are characterised by extensive use of untreated waste water and overuse of pesticides and fertilisers. In addition, chain members have low levels of resources, skills and technologies; land use is unregulated; markets are congested and dirty; customer service is poor; and sharing of market information is limited. Conversely, consumers want cleaner, safer, yet affordable vegetables; chain members need higher returns; and the government wants production and marketing activities that do not threaten food safety, public health and the environment.



Use of untreated waste water from broken sewer pipes such as this is not uncommon. This practice poses great health risks to unsuspecting consumers of these vegetables.