

SKILLS UPGRADING AND VALUE CHAIN DEVELOPMENT: A CASE OF PAKISTAN MANGO INDUSTRY

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Abstract

Linking farmers to markets has become an integral part of the development agenda of world donor agencies in developing countries in the current decade as a result of the changes in the competitive environment brought about by globalization. Under the Australia-Pakistan Agriculture Sector Linkages Program (ASLP) an initiative was taken aimed at developing the Pakistan mango industry, which is one of the major and important industries in the horticulture sector of Pakistan, using supply chain management approach. The vast majorities of rural industry development projects aimed at linking farmers to market in developing countries do not evaluate deployment projects adopting a “whole of chain” approach. This study designed to evaluate the worth and value of a Development project, mango value chain improvement project, adopted a “whole of chain” approach. Bennett’s Hierarchy (Bennett 1975) guides the research to evaluate this project. The outcome of the project concluded that improved knowledge and skills in post-harvest quality management had positive impact to adopt best practices among mango supply chain players. Results of profitability analysis indicated that farmers could get almost double return of each rupee invested in the implementation of improved post harvest Knowledge and Skills provided they market directly to high end retail stores as the BCR value is 1.96 indicating 96% return on each rupee invested. Consequently, a higher level of change in their Attitude and Aspiration was found to adopt best practice guidelines developed in the project.

Key words: Project Evaluation, A whole of chain approach, Developing countries, Pakistan

Introduction

Building market linkages of farmers in the agribusiness value chain has set out the main development agenda of the development agencies in developing countries. It recognizes the need to connect the rural economy more effectively with modern economic processes by building forward and backward linkages with rural producers. These linkages help to define rural development as rural industry development in the context of supply chain management.

Under the Australia-Pakistan Agriculture Sector Linkages Program (ASLP) an initiative was taken aimed at developing the Pakistan mango industry, which is one of the major and important industries in the horticulture sector of Pakistan, using supply chain management approach. The major constraints such as poor post-harvest handling and poor market linkages associated with the mango industry development were identified using a rapid supply chain appraisal approach (RSCA). These constraints are being addressed under a project “Optimizing mango supply chain for more profitable horticultural enterprises in Pakistan and Australia”, which used a “whole of chain” approach to development over the project period 2006-2012. This approach sought to engage key industry stakeholders from all segments of a chain in a rural industry development project and known

as a “whole of chain” focus in linking farmers to their markets (Collins et al. 2006).

Reflection on literature indicated that businesses in existing supply chains may have different perspectives on the need to change their current practices, hence their commitment to be involved in activities designed to change these practices varied from one level to the next or within a group (Batt 2005; Hofman & Ledger 2005; Murray-Prior et al. 2007; Rankin et al. 2007; Batt et al. 2010). The purpose of this research is to evaluate the effectiveness of the ASLP mango supply chain project which involves different stakeholders from farm to market. The evaluation of such case study requires an in-depth explanation of phenomenon because it involves not only elements of both outcome evaluation and management systems approaches but also an examination of the impact of the program’s activities on the knowledge, skills, attitudes and aspirations (KASA) of the stakeholders, that influence project outcomes. For example, the impact of improved post harvest practices in generating the additional value or profit all along the chain members.

Bennett’s Hierarchy (Bennett 1975) evaluation framework provides guides line to evaluate KASA. Hence the objectives of the research are framed around KASA to find the impact all along the

chain. Following research questions were set out in this regard:

R.Q.1 Was the ASLP mango project approach successful in building communal value chain knowledge and skills at each level of the mango chain?

R.Q.2 How the improved value chain Knowledge and Skills is beneficial to inspire the chain members to continue to adopt the improved practices?

Literature Review

The literature associated with program evaluation is vast and fragmented and generally aimed at evaluation theorists rather than practitioners (Dart et al. 1996). Worthen et al. (1997) state that each form of evaluation has its own built-in assumptions therefore the selection of an evaluation framework depends on the objective and nature of the program being evaluated.

Scriven (1967) was the first evaluator to write about two different form of evaluation such as formative and summative evaluation. Since then the terms have become almost universally accepted in the field of evaluation. Formative evaluation involves collection of information about program activities and about the delivery of a program to judge the value of the program. Summative evaluations are conducted after the completion of a program and set out to assess whether or not the desired outcomes have been achieved. However, summative evaluation may be formative when the findings are used to improve future or other existing programs (Dart et al. 1996; Owen and Rogers 2006).

This study set out to evaluate the effectiveness of a participatory rural industry development project that adopted a 'whole of chain' approach in contrast to a more narrow intervention focus that is typical of most development projects. Consequently, the stakeholders in this project represent all elements of the mango supply chain, from production and post-harvest operators (Growers, contractors, commission agents, exporters), to retailers and government agencies. Collectively these stakeholders form a very complex social system where each individual stakeholder group has different interests, experience and expectations.

In evaluating the impact of an intervention project on such a complex social system, it is not sufficient to merely demonstrate that an input has produced certain outputs (Green & South 2006) but requires an explanation of effectiveness of the processes used in delivering these outcomes. In other words, it is more important to understand how change occurred and how the mechanisms of change operated in a particular context from different perspectives (Pawson & Tilley 1997; Patton 2002).

Therefore qualitative paradigm was adopted, largely, in this study. However, quality is demonstrated in terms of economic value using cost benefit analysis of improved knowledge and skills at each level of the chain. Economic value is one of the important dimension of change in attitude and aspiration of the individual experiential learning particularly in a business context (Kolb 1984; Argyris and Schon 1996).

Among the range of evaluation models identified by Stufflebeam (2001) and Owen & Rogers (2006) this evaluation examined the impact of the program's activities on the intermediary variables – the knowledge, skills, attitudes and aspirations of the stakeholders that influence project outcomes. Bennett's Hierarchy (Bennett 1975) is the appropriate model to evaluate this project.

The ASLP project activities were classified under three headings– quality management, market understanding and supply chain management, each of which had capacity building components. Further, these activities were delivered to collaborators drawn from both commercial and government agency stakeholders. This data collection framework is consistent with that suggested by Patton (2002) for collecting and organizing data in case study research. The interaction between the interview respondents, the data collection focus and the activity categories is shown in Figure 1.

Materials and Methods

In a complex social system such as the mango vale chain system in Pakistan, the task of the researcher is to acquire insight and develop understanding by getting close to the data in order to understand the actors' points of view. In this research this was achieved by the researcher establishing relationships with selected stakeholders being involved in the ASLP project. This is a longitudinal study in which semi structured interviews are collected from the respondents at different time intervals as well as from different types of respondents (level of chains) as shown in figure above against the project interventions. The stakeholder informants were divided into two broad categories:

1. core participants- selected commercial stakeholder, growers, contractors, commission agents, exporters and retailers, and non-commercial stakeholders such as members of the R & D agencies, ASLP Project Team members, Government agencies and extension services involved in the project planning and implementation activities
2. non-core participants- mainly commercial stakeholders who participated in project field

workshops or who had a close association with core members.

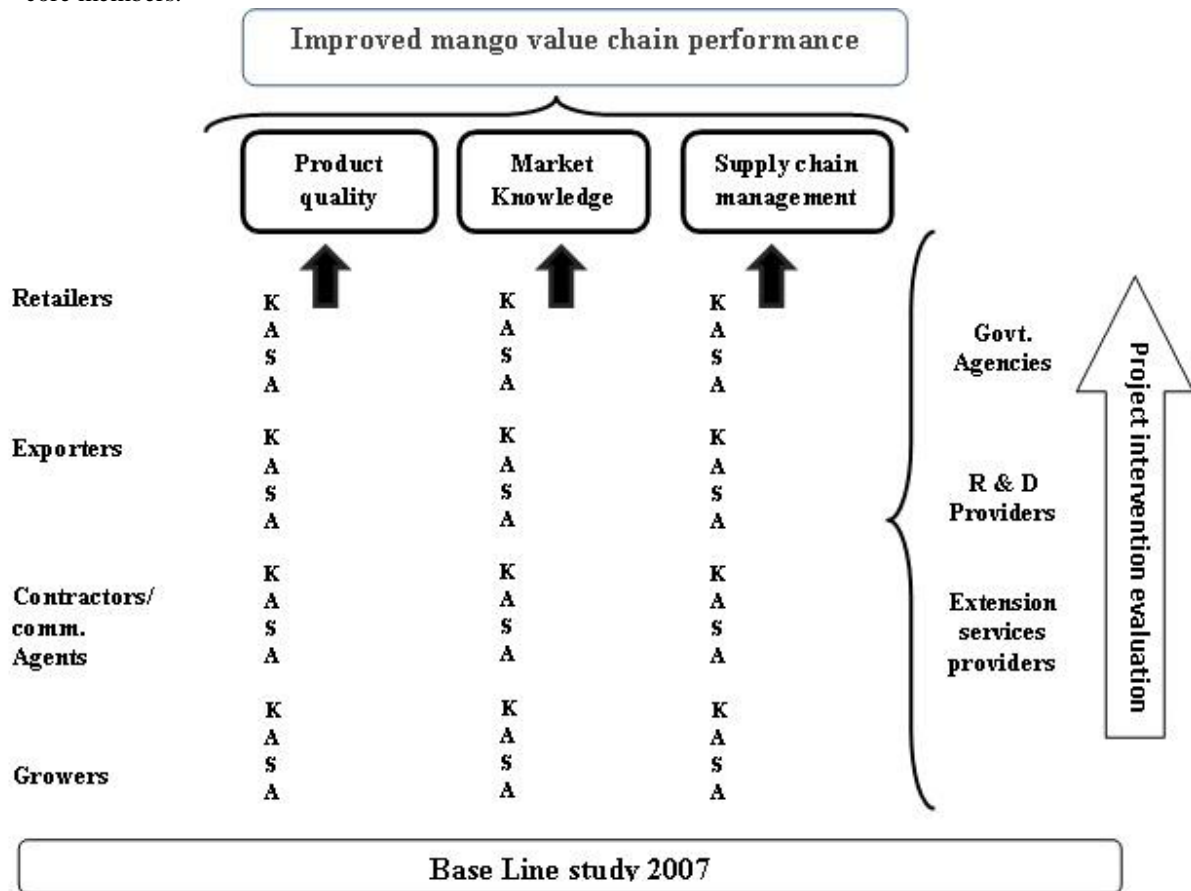


Figure 1 Data collection and analysis framework

The interviews with these informants were conducted on three occasions. The purpose of first round, conducted before the start of the project, was to confirm the practices and performance as a bench mark against which the impact of ASLP program activities could be evaluated. The second and third rounds of interviews were conducted in mid of the project year 2010 and completion year 2013 respectively. The conceptual framework for data collection and analysis is described in Figure 1.

In addition, the researcher participated in market research activities and attended workshops and meetings organized under the ASLP project which provided observational view of the project. Project documents were considered important to this study such as the project proposal and plan that provides the assumptions behind the approach taken, minutes of planning meetings associated with project activities which describe management process and resources, and finally, progress and evaluation reports commissioned by the ASLP project funding agency (ACIAR). Since the primary data was obtained from semi-structured

interviews, the qualitative data analysis strategy applied in this research was content analysis.

OUTCOMES OF THE PROJECT

Change in KASA at the grower level

The baseline data analysis confirmed that inadequate post-harvest quality management and market knowledge at the farm level had led to a lack of appreciation of the need to change traditional practices or to acquire the necessary new skills. Consequently selling fruit to contractors and commission agents at the flowering stage was the norm among the majority of the core respondent growers. However, because the growers perceived that they were not being fairly rewarded for their efforts to improve quality there was a willingness among them to change their existing post-harvest practices. This willingness to change was recognized by the Project Team in their scoping study report and had been reinforced by the participation of several core growers in the project activities.

The findings of second and third rounds of data analysis clearly showed that there was a positive attitude among growers, both core and non-core, towards obtaining the knowledge and skills

necessary for them to improve their on-farm quality management practices. This motivation was demonstrated by their participation in the field workshops that were mainly held on the farms of core growers.

However the aspirations of the growers that they would receive adequate rewards for their efforts to improve quality were not evident in the majority of cases. The major reason for this was that the traditional marketing system remained unaltered as the middlemen and exporters were not motivated to change. This will be discussed further in the next section as there were exceptions on the part of middlemen and exporters. Several of the core growers were motivated to investigate and develop opportunities for self-marketing. These growers were successful in developing links either directly with retailers or via progressive wholesalers. The growers had established these links with progressive wholesalers through attending the field workshops organized under the ASLP project. This was a practical example of growers finding compatible supply chain partners who shared their vision and were willing to share the rewards of cooperation (Batt et al. 2005; Spriggs et al. 2005; Collins & Dunne 2007). But the question was how the KASA can be translated into economic value to understand the sustainability of adoption of the improved practices after the project termination?

To answer this question a profitability analysis was conducted in which detailed cost of implementation of KASA are calculated and resulting benefits in the form of high prices are also calculated. Then additional costs and benefits of KASA are compared with the traditional costs and benefits and profitability of adopting KASA is calculated. Detailed data are collected on the costs of producing and traditional and ASLP best practices mangoes. Traditional mangoes were harvested, graded and packed in wooden boxes and directly sent to the wholesale market. Whereas ASLP best practices mangoes were harvested properly, de-stemmed and washed with fresh water in pack house at the farm level.

Total post-harvest costs of the traditionally practiced mangoes after adding logistics and opportunity costs of the growers were about 21 Rs/Kg and 32 Rs/Kg respectively while these costs for premium quality mangoes sold through wholesale market and high end retail outlet were 42 and 44 Rs/Kg respectively. The highest farm gate prices were obtained for the premium quality mangoes sold through high end retail outlet which is about 90Rs/Kg while lowest prices were obtained for the traditional mangoes which were about 45Rs/Kg. Similarly, best practice mangoes sold through high end retail markets earned maximum profit of about 45 Rs/Kg for the growers while lowest profit was obtained by the growers

from traditional mangoes which is about 23.5 Rs/Kg. However, premium quality mangoes did not get higher profits in the wholesale market as they got in the high end retail outlets. Best quality mangoes earned a profit of 31.3 Rs/Kg in the wholesale market while traditional mangoes earned a profit of 32.4 Rs/Kg to the grower which is higher than the best practices mangoes. Hence, direct market at the high end market generate premium price for the growers.

While the growers had been made aware of market opportunities and consumer expectations, especially in the domestic market, through market research and feedback activities undertaken as part of the ASLP marketing and supply chain management activities, there were no specific marketing skills development activities for them to develop their capacity in this area. However, the research findings clearly indicate that the ASLP project activities were successful in changing the KASA of core growers and the wider industry particularly with respects to on-farm post-harvest practices. The research findings also suggest that the marketing and supply chain management activities had an impact knowledge, attitudes and aspirations of core growers but there were no specific activities to build their skills in these areas.

Change in KASA at the middlemen level

The baseline study identified that the core respondent middle men (contractors and commission

agents), being closer to consumers, were aware of the potential benefits of improved fruit quality and shelf life but they had inadequate knowledge and skills to determine how their own practices impacted on the fruit quality. Hence they showed a positive attitude and aspiration towards acquiring the relevant knowledge and skills and therefore were motivated to be involved in the ASLP activities. However, as the ASLP project activities were planned and implemented, their actions started to reveal that their true interests were associated with preserving their own vested interests rather than improving the overall performance of the mango industry. The contributing factor of this kind of attitude was further explored through benefit cost analysis of traditional versus ASLP best practices mangoes.

Traditionally, commission agents charged a commission fee to sell the product or bringing together the producers and buyers. He charged about 3.5% each from grower and buyer (wholesalers/retailer) totaling to 7% and incurred about 3 Rs/Kg as a cost of handling in the wholesale market. He earned a commission of about 3.22Rs/Kg in case of traditional mangoes . While in case of ASLP best practice premium quality mangoes, commission agent did not get any

profit/margin as the commission was fixed to 3 Rs/Kg and he incurred a cost of 3 Rs/Kg for handling. The fixed amount of commission is because of the mango quality which ensured in the form of uniform grading free from chemical carbide ripening and cardboard packaging. These quality attributes ensure zero wastage rate therefore reduce cost. Conversely, because of 25-35% wastage rate claimed by the middlemen in traditionally sourced mangoes, they charge more commission to compensate the losses. This is the reason for lack of interest of commission agent to sell premium quality mangoes as they had developed skills and practices that were very effective in dealing with large quantities of variable quality fruit in a very short timeframe which strengthened their position to claim cost in form of wastage from the growers. Hence their financial incentive was tied to volume not quality.

Above description shows the role of commission agent in principle, however, this is a part of total role of commission agent in the supply chain. In fact, he is the financier of both grower and wholesalers. He provides finances to grower particularly to small growers to meet their costs and the grower is bound to provide the produce to him to sell. In this way commission agent ensures his supply. He deducts his finances and commission from the sale of the produce and give back rest of the money to grower. Similarly, wholesalers purchase the product from commission agent on credit and pay after selling the produce and again buy the new produce. As this is a regular purchase by the wholesaler almost daily in the season, they do not pay daily rather with some intervals/days. This financing role of the commission agent shows that he possesses a central position in the supply chain and to some extent has a control over the supply chain. Apparently, there is no interest rate charged by the commission agent for his financing, however, a hidden rate in form wastage of produce is present as they mainly kept the record of selling of fruit for growers. A lack of trust always prevailed between the grower and commission agents on actual sale price and the price received by the grower.

Their reluctance to work with and pay growers a premium for fruit prepared under the ASLP 'best practice' guidelines was influence by the small quantity of this fruit that was available and the lack of incentive for them to find customers who were willing to pay for quality. This was in spite of the willingness of superior fruit retailers to pay for improved quality which is identified in the domestic market research activities. It indicated that the commission agent and wholesalers were well aware of high end market opportunities but their preference to exist with their traditional selling system, volume supply, was more beneficial

form them. Consequently, they were less aspired at the end of the project with the new market opportunities and therefore showed reluctant attitude to work with ASLP best practices growers.

Change in KASA at the exporter level

The attitudes of core respondent exporters to their involvement in the ASLP project activities were similar to that of the middlemen. Initially they had a positive attitude towards being involved in the ASLP project because of the perceived benefits that the project may deliver to them in terms of their existing business activities. However, the core respondent exporters were primarily concerned with servicing high volume, low price market segments predominantly in the Middle East and the UK where there were high concentrations of expatriate Pakistanis. They showed little interest in developing new export markets though China, for example, had been identified through the ASLP market research activities. One of the main reasons were lack of

The research findings indicated that there was limited success of the ASLP project activities in altering the KASA of the core respondent exporters in terms of the knowledge they had gained concerning post-harvest orchard management and cooling of fruit. The cool chain system was not experimented before the ASLP project therefore the protocols developed for cool chain system got high recognition among the exporters. This outcome was consistent with their traditional attitude that focused on incremental change in their existing business which would enhance the mango export in the future once the appropriate infra structure would be established.

The core exporters who were selected to be part of the stakeholder group were the major exporters of Pakistan mangoes. Their selection was based on their importance in the mango industry and the influence that they could exert on the project's activities. This influence was evident in the ASLP's initiatives to develop a market opportunity in China and one of the core exporters had one of the two licensed treatment facilities that were essential to this opportunity being exploited. The weakness in the core exporter selection process was demonstrated in the findings of this research that indicated that there were exporters who were willing to adopt the ASLP 'best practice' guide lines in the development of new export markets but their existence was not known to the ASLP Project Team.

Change in KASA at the Retailer Level

While there were supply chain activities that were designed to demonstrate the potential for improved quality mangoes in the domestic market these activities involved establishing direct links between

the retailer (an international supermarket) and the core growers involved. The research findings indicated that although the ASLP activities may have improved the knowledge of the high end markets about ASLP best practices mangoes. The customers in the high end retail outlets are quality conscious and are willing to pay additional price for additional quality. Benefit to cost ratio of producing premium quality mangoes and selling directly to high end retail stores compared to traditional mangoes is 1.96 which indicates that each rupee invested to produce will result into a benefit of about 1.96 rupees showing about 96% profit. This is one of the important findings that best place for selling premium quality mangoes is high end retail outlets. However, little evidence was found that retailers were aspired to buy directly from the growers despite the fact that they could earn an additional profit of 100% more on ASLP best practices mangoes than the traditional mangoes.

In fact the ASLP best quality mangoes were marketed directly from growers to high end retailers which involved lot of marketing operations such as transportation management, storage and customer services. As established above that mango growers have little skills to address these marketing issues therefore unable to address the market need on consistent and regular basis. While the traditional mangoes channeled through commission agents and wholesalers who have specialized skills to handle the logistic and volume sales on consistent basis. Commission agents don't have self-interest to sell ASLP best practices mangoes as their margin was fixed.

Change in KASA at the institutional level

The base line data confirmed that research development and extension agencies of Government department played an important role to facilitate the growers as well as Agricultural marketing system. It had indicated that they understood the role they had in providing an enabling environment that would facilitate an improved performance of the mango industry in Pakistan. However, they recognized their knowledge and skill deficiencies across a range of issues including quality management in connection to market needs and in particular supply chain management. They acknowledged they were in need of improvement and therefore they expressed a strong desire to be involved in the ASLP activities.

All three components of the ASLP project – quality management, market research and supply chain management, had capacity building activities embedded in them through experiential learning activities for both commercial and non-commercial stakeholders. However the research findings

indicate that these capacity building activities were focused more towards technical skills than those associated with marketing and supply chain management. It is also evident from the above that growers are more motivated than the other chain partners down the chain.

Consequently, the marketing and supply chain capacity building activities that were initiated involved Pakistani members of the ASLP Project Team. While this was beneficial to their development of marketing and supply chain management skills in terms of the impact of market requirements and guided their quality improvement activities, it did not contribute to a broader understanding of the importance of marketing and supply chain management knowledge and skills within the institutions involved.

A cooperation across the industry between the institutions and commercial partners (exporters, high end retailers) have already established particularly on ongoing cool chain studies that indicated an effective change in terms of cooperation between the commercial and non-commercial stakeholders on commonly identified issues that showed their positive attitude and aspiration towards change.

Conclusion

It can be concluded that knowledge and skills in post-harvest quality management had positive impact among those who had willingness to change their practices, for example the core respondent growers. The willingness to change was strengthened as the quality management knowledge and skills were reinforced by market knowledge.

Conversely, the participants who did not find any compelling reasons to change their traditional businesses showed a reluctant attitude towards improved post-harvest quality management knowledge and skills for example the core respondent middlemen and exporters. However their resistance to change compelled the core respondent growers to find the alternate channels for their efforts. The marketing and supply chain management skills within the institutions were of critical importance to facilitate the core growers in developing new market channels or chains. This was not adequately addressed in the ASLP project.

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