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Experiences with up-grading in the mango value chain: A case of Pakistan Mango Industry

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Experiences with up-grading in the mango value chain: A case of Pakistan Mango Industry

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Abstract

There is a little evidence of published literature on incorporating on-farm workers into Global Agricultural Value chains system. Agriculture, employing 43.5 % of the total work force, contributes 21% to GDP of Pakistan. Mango (*Mangifera Indica*) “King of Fruits” is second major fruit crop in the country. Throughout the past two decades, a political opinion has developed a new food system which comprises the whole of value chain approach “farm to fork” have changed the agribusiness development in the rural industry development context. These types of development are incorporating into Global certification systems by emphasizing on labor rights develops the sustainability in value chains. Due to increasing pressure and market incentives for certified products, Mango farms in Pakistan are acquiring certifications such as Global GAP certification to produce best or premium quality fruit for the markets. This business strategy has increased the income of the farmer if it is adopted effectively and efficiently. However, a sustainable value chain drives a sustainable livelihood of the workers which can be ensured with a growing philosophy of decent work under broad umbrella of ILO. The present study is designed to evaluate the effects of decency in Value chain on the livelihoods of on-farm workers for certified orchards in Pakistan which is one of the top five mango producing country in the world.

Key words: Global value chains, on-farm workers, Decent work, premium quality, social upgrading

An overview of the Pakistan mango industry

Pakistan is a country of 170 million people, two-thirds of whom reside in rural areas. The agricultural sector is one of the mainstays of Pakistan’s economy, contributing 21 per cent of GDP, employing 45 per cent of the country’s workforce, and being a major source of foreign exchange earnings (Government of Pakistan 2010). Furthermore, the overall performance of agriculture sector was 2.0 per cent of GDP during the year 2009-10. The major crops such as wheat, cotton and rice account for 32.8 per cent while and minor crops, including horticultural crops (fruit, vegetables and condiments), contributing 11.1 per cent to overall agriculture GDP (Government of Pakistan 2010).

Horticultural crops alone contribute \$US1.91 billion, which is 26 per cent of the total value of all crops and 81.8 per cent of the total value of minor crops (PHDEC 2005).

Mango (*Mangifera Indica*), commonly called ‘king of fruits’, is native to Southern Asia, especially Burma and Eastern India. The mango is considered a fruit of excellence, and thus has a prominent position among the commercial fruits grown in Pakistan. It is the second major fruit crop after citrus, with an annual production of around 1.72 million tonnes in 2008-09 (MINFAL 2010).

Mango production in Pakistan has increased overtime but this increase is mainly attributed to an increase in area under cultivation and not due to significant increase in mango yield. Mango production in Pakistan increased from 519.2 thousand tonnes to 1816.7 thousand tonnes, showing an increase of 237 per cent over the years, 1970-71 to 2013-14 (PBS 2015). Pakistan produces many mango varieties, which differ in harvesting time and in their physiological characteristics, especially shape, size, colour, sugar level and acidity. While production is dominated by two major varieties: Chaunsa (*Mangifera Indica*) and Sindhri (*Mangifera Indica*), other varieties such as *Langra*, *Anwar Ratool*, *Dosheri*, *Bangan Palia* and *Neelum* are cultivated to a lesser extent. Only *Chaunsa* and *Sindhri* produce a significant volume of fruit to make them important from an export point of view. The mango season extends over five months, starting in mid-May in Sindh and finishing late September in Punjab, with late June to mid-August being the peak production period. Sindhri (*Mangifera Indica*) variety is commonly recognised for its aroma and mainly grown in the Sindh province while Chaunsa is famous due to its sweetness and is a popular variety of Punjab Province. Multan Division in Punjab and Hyderabad Division in Sindh are famous regions in Pakistan for these two main cultivars (Chaunsa and Sindhri) of mango.

Province wise data of mango production revealed that Punjab and Sindh are the major mango producing provinces; they contributed 1380.0 thousand tones and 370.5 thousand tons respectively. Baluchistan and NWFP (new name Khyber Pukhtoonkhwa) also produce mangoes but these provinces have little share in the total production due to incompatible weather conditions. Baluchistan (8.5 thousand tonnes) and NWFP (3.8 thousand tonnes) to national mango production in 2014-15 as shown in Table 1 (PBS 2015).

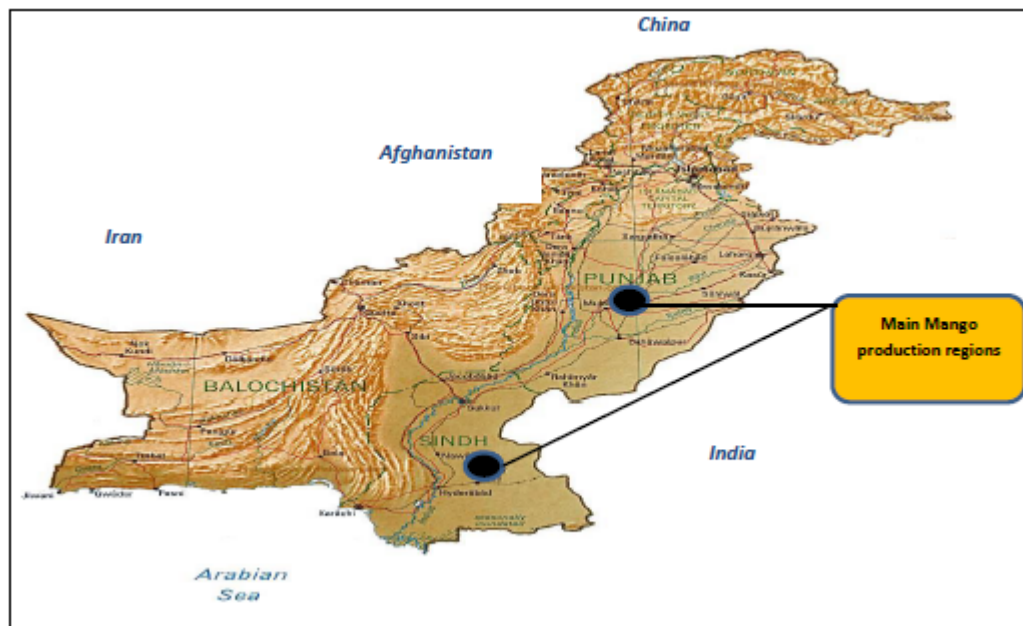
Years	Punjab	Sindh	NWFP	Baluchistan	Total
1970-71	320.1	197.1	1.0	2.0	519.2
1975-76	350.7	241.7	0.6	2.7	595.7
1980-81	273.9	267.4	1.5	3.8	546.6
1985-86	450.6	257.2	1.5	4.1	713.4
1990-91	501.0	267.1	1.9	6.0	776.0
1995-96	598.8	291.7	2.2	15.1	907.8
2000-01	634.9	340.3	2.3	12.3	989.8
2005-06	1373.1	368.1	4.0	8.5	1753.7
2009-10	1356.0	360.5	3.9	8.0	1728.4
2014-15	1380.0	370.5	3.8	8.5	1752.8

Table 1: Production of Mango (000 Tones)

Pakistan produces many mango varieties, which differ in harvesting time and in their physiological characteristics, especially shape, size, colour, sugar level and acidity. While production is dominated by two major varieties: Chaunsa (*Mangifera*

India) and Sindhri (*Mangifera Indica*), other varieties such as *Langra*, *Anwar Ratool*, *Dosheri*, *Bangan Palia* and *Neelum* are cultivated to a lesser extent. Only *Chaunsa* and *Sindhri* produce a significant volume of fruit to make them important from an export point of view. The mango season extends over five months, starting in mid-May in Sindh and finishing late September in Punjab, with late June to mid-August being the peak production period. Sindhri (*Mangifera Indica*) variety is commonly recognised for its aroma and mainly grown in the Sindh province while Chaunsa is famous due to its sweetness and is a popular variety of Punjab Province. Multan Division in Punjab and Hyderabad Division in Sindh are famous regions in Pakistan for these two main cultivars (*Chaunsa* and *Sindhri*) of mango. The geographical locations of mango regions in the two provinces are shown in Figure 1.1 (Next page).

Pakistan is the fifth largest producer of mangoes preceded by India, China, Thailand and Indonesia as indicated in Table 2 (FAOSTAT 2011). Marketing of mangos is mainly in private hands and the role of the public sector is confined to creating an enabling environment that may include the provision of physical infrastructure, regulatory measures, market intelligence and market promotion.



Countries	Production (MT)
India	13557100
China	4140290
Thailand	2469810
Indonesia	2150000
Pakistan	1728000

Table 1: Chief Mango producing countries

Mango value chain system in Pakistan

The majority of growers sell their product at the flowering stage to contractors who perform a key fruit marketing role. Selling out the orchard to the contractor is the normal practice in Pakistan's mango industry. Various reasons have been identified for this, such as farmers being reluctant to take the risk of price and income variation due to perishability, quality and seasonality, and lack of marketing knowledge of the product (Khushik & Smith 1996). The duration of a contract between grower and a contractor varies from one to three years, and is normally settled on the basis of the previous year's price, production and flowering condition of trees. Contractors are the major source of finance for growers. They may advance one-third of the contract value before harvesting, and in some cases the advance is paid in full (Khushik & Smith 1996).

Contractors perform functions such as picking, packing and transport of fruit from orchard to wholesale market (Mandi). Orchard management is usually the responsibility of the grower; however, some contractors, depending on the type of contract, can influence orchard management practices. But, overall, contractors are more interested in fruit quantity, rather than sustainable orchard management and fruit quality. Since the ownership of the crop changes hands when the contract is signed there is little incentive for farmers to engage in optimum orchard management practices, such as insect control, that impact on fruit quality. Since these two-chain player, grower and contractor, organize the labor or worker force at the farm level therefore got the high level of responsibility to recruit, train and monitor the on-farm labor activities.

Contractors, in turn, have very close associations with commission agents who operate in the wholesale markets and who are their major source of finance. Commission agents have inter-regional wholesale markets contacts and possess accurate market information, and therefore hold an important position in the market (Badar 2008). Some commission agents also act as contractors in which case they also hold title to the fruit. The contractors and commission agents play a pivotal role in mango marketing in Pakistan, and are therefore considered key players in the marketing system (PHDEC 2005).

Wholesalers purchase fruit from the commission agents at auction and on-sell to local retailers. The activities in each wholesale market are regulated by a Market Committee established by the Directorate of Agriculture. Retailers are the terminal point of sale to the end-consumers and have different outlet forms such as road-side fruit and vegetables shops, donkey carts, some exclusive urban fruit shops, and national and multinational supermarkets which are mainly located in big cities. The domestic market is the major market for Pakistan mangoes with only five per cent of the crop exported (PHDEC 2005; Ghafoor 2010). In the case of the export market most of the exporters buy from wholesale markets through a wholesaler or commission agents but some exporters also buy directly from the orchard. Some exporters also act as commission agents or vice versa.

The domestic retail markets are dominated by small retail shops, street hawkers and road-side stalls. Mango prices in these markets range from \$US0.40 per

kilogram (30 Rupees) to \$US1.0 per kilogram (75 Rupees), depending upon the type of outlet and its location (higher in more affluent metropolitan areas and less in wet markets). Grower share of the consumer dollar in these markets is estimated at approximately 28 per cent (PIAM 2007; PARC 2009). Well organised 'superior' retail markets are uncommon except in big cities like Karachi, Lahore, Islamabad and Faisalabad, and these retail outlets are setting trends for quality products among consumers (Mustafa & Mehdi 2007). They mainly source fruit from wholesale markets and sometimes directly from commission agents. Some additional retail markets for mangoes are multinational chains like Metro and national level superstores. These outlets are increasing in the major cities but are still in an introductory phase of procuring premium quality fruit from reliable sources. Food service outlets include better quality hotels, which may include mangoes in fruit baskets in guestrooms, and restaurants that serve mangoes in season.

Mangos are the leading fruit export after citrus and Pakistan is the fourth largest exporter of mangoes in the world followed by Mexico, India and Brazil (Ghafoor 2010). Gulf countries (UAE, Saudi Arabia and Oman) are the major traditional export markets. The United Kingdom is the major market in Europe; Germany, France, Norway, Denmark, Switzerland, Singapore, Malaysia and Hong Kong are other important markets. The People's Republic of China and Iran are likely to emerge as future prominent markets for Pakistani mangoes. Exports are freighted by air to Europe and by sea to Gulf countries (PHDEC 2005). While Pakistan is a major exporter of mangoes it Pakistan receives the lowest average price per kilogram of any major mango-producing country in the world (PHDEC 2005). Pakistani mangoes receive `USD 0.30 per Kilogram in comparison to USD 1.59 of Philippines, USD 0.91 of China, USD 40.48 of India and USD 0.46 of Thailand (Collins et al. 2006). Additionally, the prices of the mango in the domestic markets starts high at average Rs. 50 per Kg at the start of the day and discounted up to the half of the beginning price at the end of the day (Mustafa & Mehdi 2007). There are several reasons for the low prices received for Pakistan mangoes but the major influences are the poor quality and short shelf life (PARC 2009). Mango value chain system in Pakistan is depicted in Figure 1.

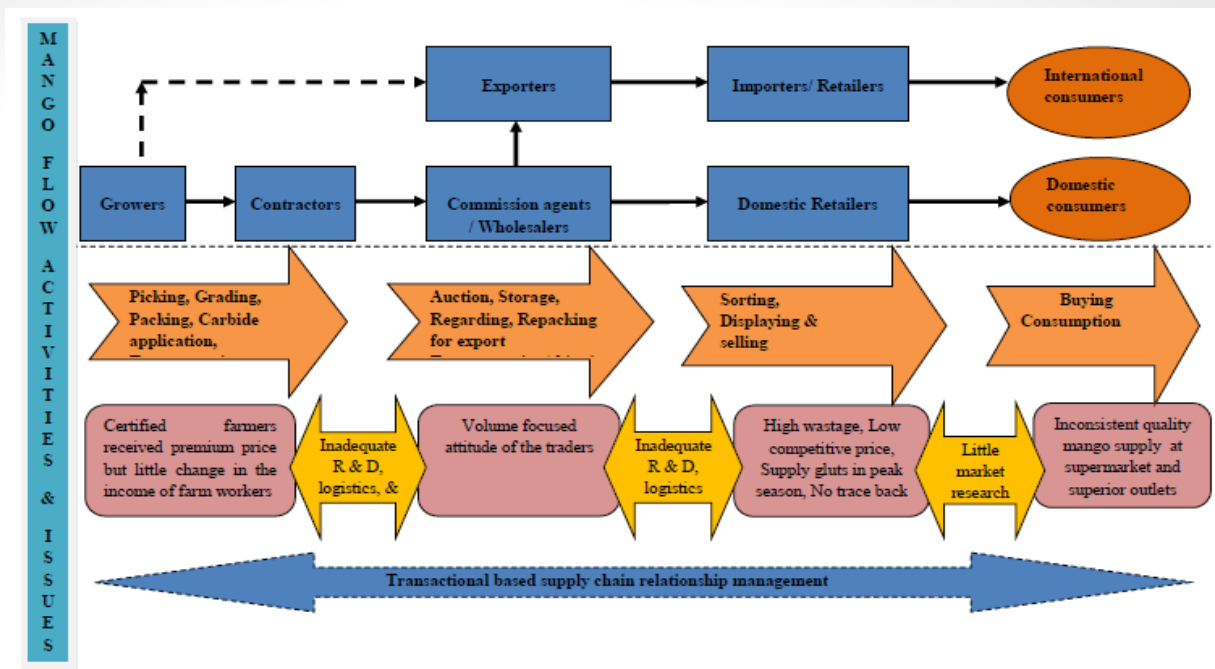


Figure 1: The traditional Pakistan mango supply chain system

Constraints to the development of the mango industry

Consumers of Pakistan mangoes appreciate their good flavour, delicacy and nutrient value, and domestic demand is strong (Khushik & Smith 1996). Therefore the Pakistan mango industry has the potential to increase its contribution to the Pakistan economy. However, as noted previously the market price is low both in domestic and export markets due to poor quality (Collins et al. 2006; PARC 2009) and this situation will only get worse as the domestic retail market evolves with the emergence of supermarkets and high quality fruit outlets, where consumers demand a better quality, consistent, and reliable source of supply. The constraints to the development of the industry are associated with pre and post-harvest operations that can be grouped into two main areas - production, and marketing systems.

Constraints at the production level

Constraints at the production level revolve around orchard management, harvesting practices and post-harvest handling.

Traditional orchard management in Pakistan perpetuates a variety of diseases that afflict the fruit. Powdery mildew (*Oidium mangifera*), Stem end rot, anthracnose (*Glomerella cingulata-Colletotrichum gloeosporioides*) and stem blight (*Diplodia spp.*) are recorded as the most common diseases that impact on all varieties of mango (Jiskani 2005; Amin et al. 2008).

Proper (or improper) orchard management is a result of the marketing system, where the contractors gain ownership of the crop at the time of flowering. Some contracts include the cost of 'pesticide spray' among the responsibilities of the contractor. Here, all management costs are borne by the farmers, except the cost of pesticide spray. In other contracts 'all management costs', i.e. ploughing, inter-

culturing, use of inputs such as farmyard manure, fertiliser and pesticide sprays, and are considered the responsibility of the contractor. In this case the duration of the contract is usually more than two years. Contractors concentrate their attention on recovering money outlaid on the contract by maximizing production while minimizing expenses often at the expense of fruit quality and orchard health. Again, depending on the contract conditions, growers may avoid irrigating their orchards when required, or conduct timely inter-tree culturing and manure application.

This system of divided responsibility for orchard management between growers and contractors contributes to the prevalence and persistence of disease in mango orchards which is compounded by harvesting and post-harvest handling practices.

Traditionally, contractors are responsible for harvesting, sorting, packing and transport of mangoes. These practices include:

- **Strip harvesting** – this involves harvesting fruit with a wide variation of maturity in order to reduce harvesting costs.
- **Hand picking** – inattention to stem removal causes sap burn, which results in unattractive blemishes on the skin of the fruit. In addition, the sap attracts microorganisms (attached to soil particles) and insects.
- **In-field sorting and packing** – the fruit is collected, placed on the ground and sorted. This practice exposes the fruit to soil-borne contamination. Sorting involves the removal of diseased and damaged fruit prior to packing in wooden boxes. The use of wooden boxes further exposes the fruit to disease pathogens. The wooden boxes are designed to contain 10kg of fruit however it is common practice for them to contain up to 13kg in order to reduce transport and handling costs. A by-product of this practice is increased physical damage and bruising of the fruit.
- **Transport** – the over-packed boxes remain in the field until they are loaded onto open trucks for transport to the wholesale markets. The trucks are usually overloaded, have poor suspension systems and travel on poorly maintained roads. This practice again contributes to physical damage and bruising. The lack of any temperature control accelerates ripening and the development of rot. Hand picking also attracts soil particles, as well as microorganisms attracted by the sugary sap; ultimately fruit appearance and soundness is badly affected.

The combined effect of these traditional practices is a high level of product waste, and low market prices (Amin et al. 2008). Research indicates that across the two main varieties (*Sindhri and Chaunsa*), an average 72 per cent of the fruit harvested did not reach the consumer, mainly because of physical damage or breakdown (Collins & Iqbal 2010). In the domestic retail market, research has shown that, 25 per cent of fruit was diseased, 58 per cent of fruit was physically damaged, and 14 per cent of fruit had sap burn, thus leaving only 3 per cent of fruit free of any disorder (Mazhar et al. 2011). This research which was the first to quantify the losses along the supply chain clearly shows the gains that can be made in the development of the Pakistan mango industry if these traditional practices can be improved.

The Research, Development and Extension institutions such as the University of Agriculture Faisalabad (UAF), Ayub Agricultural Research Institute (AARI) and

provincial Extension Agencies have an important role to play in this respect. However, these institutions have little capacity, particularly in post-harvest management, to ensure that the relevant knowledge and skills are developed and transferred to the mango industry (Collins et al. 2006). This deficiency is most evident in the provincial extension services, where the lack of a flexible information dissemination system in the wider farming community, is a major impediment to the adoption of improved agricultural systems and practices in Pakistan (Davidson & Ahmad 2002).

Constraints in the marketing system

As described earlier, the mango marketing system in Pakistan is dominated by contractors and commission agents (PHDEC 2005). The majority of contractors obtain loans from commission agents to pay the initial instalment to the mango growers and to pay an advance for labour and packing material (Khushik & Smith 1996). Under this system, once a loan has been extended, the contractor is obliged to supply mangoes to that commission agent. The commission agents have the power to control the mango supply through contractors. In the early season they encourage contractors to bring their mangoes to the market as they can earn higher prices. Whereas in mid-season they encourage the contractors to delay the harvest as they can get a better price in late season. However, contractors have inadequate post-harvest quality management knowledge to extend the shelf life. As a result, a huge supply glut is a norm in wholesale markets during the mid-season. Under these conditions commission agents do not own the title of the fruit and charge the commission (2-3 per cent on sales volumes) through open auction. These attempts to manage supply have an impact not only on price but on fruit quality, in terms fruit size, maturity and wastage.

The mangoes are sold in the wholesale markets through an open auction conducted by the individual commission agents where the buyers bid for boxes of mangoes offered for sale. The opening price for the auction is set by the commission agents on the basis of the grade (VIP, Super, Special) indicated on the box or the general appearance of first layer of fruit in the box. During the auction, the producer or contractor can observe the bidding and know exactly the price offered for their produce (Khushik & Smith 1996). If the offer is too low the lot can be withdrawn but this option is limited by the short shelf life of the fruit and the lack of storage facilities.

As Khushik & Smith (1996) point out, this traditional auction based selling system raises many issues in terms of bargaining power, contract enforcement and information access that establishes exploitation of producers as the norm. Consequently, there is no evidence of a value-oriented approach to supply chain management and due to the systemic impediments to production, postharvest and marketing (domestic and export), the overall performance of the mango industry in Pakistan does not match the potential of the industry (Collins et al. 2006).

Current Development and Challenges

In spite of these constraints the Pakistan mango industry has potential for growth. Opportunities include exploiting the growth in supermarkets and speciality stores in the domestic market and accessing higher value market segments in export markets by ensuring consistent and reliable quality fruit for quality-conscious customers. Grasping these opportunities, a process of development in Pakistan mango industry has already been undertaken under the various development projects over the period of last ten years. For example, protocols for Controlled Atmosphere (CA) sea shipments particularly for *Sindhri* variety is one of the great achievements in this regard. Similarly, the development of on-farm infrastructural facilities such as state-of-the-art mango processing unit in selected areas of Punjab and Sindh are providing opportunity to growers to become a part of more value-oriented supply chain. The growers and to some extent traders (commission agents, exporters) have been trying to transform their existing chains towards more value or quality-oriented chains but did not achieve an adequate success so far.

Objectively, quality is the aptitude of a product to satisfy the needs of its end users that must be maintained along the chain such as farm to retailers (Batt, 2005). The concept of "premium quality" mango was introduced in Pakistan mango industry with the inception of Australia-Pakistan Agriculture Sector Linkage Program (ASLP) in 2006. Pakistani consumer's perceptions toward best quality mangoes were documented in domestic market research activity under the mango value chain project. The research indicated that consumers are willing to pay 20-25 per cent premium price for clean, blemish-free, fully matured and uniform size of mango (ACIAR, 2006). It was witnessed that a market does exist for such quality fruits at the high-end market in the big metropolitan cities. The common reaction among the growers regarding premium quality mango market is continuing to be successful to produce the desired mangoes for the market (Mehdi et al., 2014). They got high return on premium quality through direct marketing or selling directly to the high-end market. As the present study is specifically seeking the profitability of production and sales of premium quality mangoes for the domestic markets of Pakistan, detailed data on pre- and post-harvest costs was collected and profit margins were calculated for three categories of mangoes, traditionally procured through existing marketing system, best practices through existing marketing system and best practices through direct marketing at superior outlets. The results are presented in Table 3.

Table 3. Growers profit/margin (Rs/Kg).

Description	Super (Traditional) mangoes through wholesale market	Best mangoes through wholesale market	Best Practice mangoes through exclusive outlet
Pre-Harvest Costs	4.38	4.38	4.38
Post-Harvest Costs	7.65	29.62	29.62
Logistics Costs	6.22	5	7
Working Capital (Opportunity costs)	3	3	3
Total Costs	21.25	42.00	44.00
Farm Gate Price	44.73	73.33	88.88
Grower's Margin/Profit	23.49	31.33	44.88
Additional Profit		7.84	21.39

Authors' calculations

Results reveal that premium quality mango is more profitable compared with traditionally procured mangoes. The sales of premium quality through high end

retail outlets (exclusive outlet) earned highest profit of about 45 Rs per Kg which is 22 Rs per Kg higher than the profit of selling traditional/Super quality mango through commission agent in the wholesale market. It was found that profit of best practices (premium quality) mango sold through high end markets/superior outlets are double than the traditionally handled mangoes. Profits of the growers are calculated using equation 1 ($\pi = TR - TC$) by deducting total farm costs which are the sum of pre and post-harvest costs, logistics costs and opportunity cost (working capital) of the work of the growers from the revenue. The costs and revenues are measured in rupees per kilogram hence the price per Kg is the revenue per kg and resulting profit is also presented in Rs per Kg. Total pre-harvest cost remained the same for traditional and best practice mangoes which indicated that the benefits of economic gain on premium quality mangoes did not pass on to the workers or labors.

With the induction of state of the art processing facilities on some selected mango farms, there is an opportunity to create mango clusters around these leading farms which require more skilled labor force than the traditional ways of doing harvesting and processing. High skilled workers must be maintained with incremental wage rate, incentive and social protection in form of health and safety as modern operations and techniques involves specialized tasks and precision therefore a cost. Since the mango growers are highly dependent on contractor for the fruit harvesting and packing therefore little control on the quality. Some growers had

initiated to hire permanent labor and trained them on the modern techniques and practices and tried to build direct linkages with the supermarket chains and achieve positive response but could not made these linkages sustainable. The arguments here is that while incentives to pursue the high-end value markets are beneficial in the long run, the risk of short-term economic cost and thus a danger to competitiveness cannot be denied (Schutzhofer 2014) for existing mango value chain system in Pakistan as the social and political obstacles to innovations are little understood so far- a status quo that effect the overall mango value chain system in Pakistan.

Economic theories and many previous studies have explored that more experienced people have the capacity to work more efficiently (Mincer, 1974). The present study further explored the decent work deficit at the farm level that explain the effect of key factors on labour performance. It was found that coefficient of experience showed a positive relationship with wage and estimated that with one percent increase in experience boosts the income by 12 percent and was found slightly significant at 10% confidence level ($p > 0.10$) in ceteris paribus conditions. Experience improves the skills of labor to deal with different disorders at farm level and enables the labor to perform their daily work affairs in a superior way.

Implementation of “**Occupational safety and health**” is now a growing trend on certified orchards in Pakistan. There is a common perception that safety and environmental regulations enhance the costs of production directly, these type of direct effects dominate people’s opinions, but in fact it increases economic efficiency of farm making them competitive with respect to other orchards. This variable was taken as physical indicator for on farm labor and indicates non-significance effect at 10% level of confidence ($p < 0.10$) with a P-value of 0.17 and

that can be interpreted significantly at 20 % level of confidence. The model predicts that, keeping the effect of other variables constant, labor availing the charms of safety equipment's, chemical separate rooms, 1st aid boxes, hazard signs, uniforms, proper sanitation facility, hygiene meals and doctor contracts may have 13 percent more average income.

While the variables used for “**specialized Professional**” was found significant at a confidence level of 1% “(p<0.01) and p-value was 0.006. Model discovered that professionals who got regular trainings may have positive impact on income which can be interpreted in a way that average income for specialized professional will increase by 26 percent in ceteris paribus conditions. These workers are known as skilled agricultural workers. This result is not out of box because it makes labor to prove their identity in the on-farm industry like machine operators, packaging experts, harvesters, supervisors etc. and in return it contributes directly to career development and ultimately income.

Moreover, most efficient and productive labor can be acquired by their satisfaction at work place as well as after quitting the job. **Compensational payments** was an important variable for economic context of decent work according to ILO. This variable showed a positive impact on the income and explored that laborers receiving on-farm compensation payments e.g. sickness leaves, maternity leaves, special occasions and Employment injury benefits, are receiving on the average more income by 11 percent in ceteris paribus conditions at the confidence level of 10% (p<0.10). This can be explained in an indirect way that more organized and economically secured labor will increase farm income by minimizing pre and post-harvest losses and in in response income will be affected indirectly.

Credit Facility was another dummy in economic context to check its impact on income and was found to have significance effect was shown by this variable at confidence level of 5 % (p<0.05) explaining that average income for workers enjoying credit facility may be increased by 14 percent in ceteris paribus conditions.

Unionization is understood as a major factor in wage determination due to collective bargaining power and workers' representation. “**Labor unions**” was taken as first dummy variable in social context of decent work to assess its impact on income was found slightly significant at 1 % level of confidence (p<0.01) and indicates that labor working under the cover of labor unionization have positive impact on their income and interpreted as workers employed at farms having labor unions may have on the average 20 percent more income unlike the non-certified farms not allowing labor unions.

It is not surprising that “**caste harassment**” has a negative impact on the income of laborers. According to results of our model, Workers harassed on caste basis may have on the average 18 percent decreased income, assuming the effects of other variables constant. It is taken as a major factor during the remuneration of wages in developing countries especially in the South Asia (Das & Dutta, 2007). The variable was found highly significant at 1% level of confidence (p<0.01). Therefore, implementation of social rights regulations should be established by Governments according to ILO decent work sustainable development goal#8 that will ultimately address as determinants of income. Direct labor laws for on-farm workers should

be developed by governments which are not available as such in Pakistan but India has implemented some legislations for on-farm labor.

Government is often the principal actor in rural industry development interventions in developing countries because of its impact on reforms via its regulatory powers and R& D institutions (Rondinelli 1983; World Bank 2010). It was found that there is a lack of labor policy for rural industry workers which was one of the major impediments to improving the competitiveness of agribusiness firms in Pakistan under the new global market challenges facing them.

Conclusion

The certified orchards are driven by the global value chain system under the quality standards; they have more potential and prospective to improve the livelihood of the on-farm workers. From a rural industry development prospective, there is a dire need of appropriate policy development and intervention through participatory approach in the industry to modify their traditional practices, cooperate with each other and jointly invest in their future.

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Nazioarteko Hizketaldia

ELIKADURAREN ETORKIZUNA ETA NEKAZARITZAREN ERRONKAK XXI. MENDERAKO:

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