Understanding Export Challenges and Potential for Mangoes and Chillies.

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Abstract
The objective of this report is to explore the export market challenges and potential of two horticulture products of Pakistan – mango and chilli. It presents the preliminary findings from the in-depth one on one qualitative interviews with representatives of industry bodies, government and non-government entities, exporters, processors and owners/operators of pack houses, as well as a visit to the Karachi wholesale markets. Given the increasing demand in the international market, Pakistan has the potential of expanding its exports of mango, mango products and chillies. However, the industry is currently challenged with various impediments at different stages, ranging from non-standard post harvest handling, lack of proper storage facilities, improper handling at the ports to high cost of transportation – resulting in higher cost of export compared to the other neighboring exporting countries. The existing system also does not seem to provide incentives to growers to enhance quality or productivity, or acquire better skills and expertise. The industry has received minimal support on equipping it to export and connect to the international consumer. Hence, a large majority of challenges that are currently limiting export, specifically of mangoes, also gear around market access, market connectivity and marketing. Country branding for agriculture will develop the image of Pakistan as a producer of quality agricultural produce, enabling long-term export development of a range of agricultural commodities. To equip smaller farmers to export, it is recommended to develop agricultural hubs near farms. The agri hubs will act as regional support centres, providing export readiness trainings and certification (GAP etc.), transport, centralized sorting, grading, packing and value addition processing and cold storage facilities so that every farmer has the opportunity to deliver a better product for the market.

Keywords
Horticulture, Mango, Chilli, Value, Addition, Pakistan

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Prologue
Pakistan’s horticulture sector is one of the largest globally, with the privilege of ranking amidst the top 5 for numerous crops like mangoes, chillies, dates, kinnows (citrus). However, faced with inefficiencies across the value chain, lack of resources for small landholder farmers and challenges in marketing and global market access, means that produce from Pakistan most often does not reach its full price and market potential in international markets.

This section of the report investigates challenges faced at export market levels for Pakistan’s mango and chilli exports to reach their maximum potential.

Significant part of the writing on chillies has been drawn from the work of Pakistan Agricultural Coalition (PAC) in Kunri and the electronic trading platform and the manual on electronic trading platform by Mr. Kazim Saeed.
1 Background

In the 2017-2018 financial year, Pakistani exports increased by 13.7%, increasing from USD 20.41 billion in 2016-2017 to USD 23.3 billion in 2017-18 (ITC 2014). This reversed a declining trend of the previous 3 years. Fruits, vegetables and spices contribute only 3% to total export at USD 720.8 million. Mango exports constitute 6-7% of total fruit, vegetable and spices exported while chillies stand at less than 1% (TDAP).

Pakistan ranks as fourth largest producer of both mangoes and chillies globally, producing approximately 1.7 million tonnes of mangoes and 142.1 thousand tonnes of chillies annually. However, Pakistan exports only 6-7% of its total mango production annually and less than 10% of potential of chillies, which is estimated at having an export potential of USD 47 million (ITC 2014).

Hence the need for this ACIAR funded project to investigate and understand the challenges that inhibit the success of mango and chilli exports from Pakistan.

2 Methodology
The export market challenges and potential was investigated through in-depth one on one qualitative interviews with representatives of industry bodies, government and non-government entities, exporters, processors and owners / operators of pack houses, as well as a visit to the Karachi wholesale markets.
3  Key players and structure in the mango and chilli market value chain.

3.1  Mango
The roles in the mango value chain are distinctly exclusive, and very rarely overlap. Those involved in production and those involved in marketing of the produce, particularly exports are distinct. The role of farmers primarily extends till harvest and post harvest, and the farmers key responsibility is the health of the crop. Mango orchards are usually “purchased” in advance, prior to harvest by market agents. This decision, know as “theka” is taken primarily six months prior to harvest and the agent also has a say in maintenance of the crop to ensure a healthy and viable one. Majority of growers are ill equipped to export, and rely primarily on market agents to promote their produce to the markets. The market agent has the linkages and access to the market, which the farmer often does not. With the exception of the members of Sindh Mango Growers and Exporters (SMGE) organisation, who are growers and exporters, players within the mango value chain, are either growers or exporters and limited forward integration exists by growers or backward integration by exporters.

It is pertinent to keep in perspective, that under 10% of Pakistan’s mangoes are exported (TDAP). The majority of mangoes produced are consumed at a domestic level and hence require a rudimentary level of processing.

Mangoes destined for export are sorted and identified at farm level and do not enter the traditional wholesale markets as they have already been “purchased” in advance by “theykaydaars”. Exporters often partner wit” ‘theykaydars”’. Rudimentary sorting is done by the farmer or the ‘theykaydar” at farm level and the mangoes destined for export are transported to processing facilities where they are prepared for exports.

Significant farm level work has been done in conjunction with donor partners like USAID, AUSAID, particularly through the Agricultural Sector Linkages Program (ASLP) on orchard management to produce a better quality crop and to ensure compliance with Good Agricultural Practices (GAP). Focus of development programs have ranged from disease and integrated pest management, tree management, pruning, harvest and post-harvest handling. Hence orchards that gear their production towards high end markets, particularly exports, are equipped to undertake relevant picking techniques and rudimentary sorting grading and packing in plastic
crates at orchard level to ensure integrity of the fruit for transport to further processing facilities (ACIAR 2011).

However, dissemination of such skill sets is limited to fewer larger farms. The beneficiaries of training and skill uplifting have been the larger orchards whose owners are often powerful and highly influential. Smaller farms within the country are still wanting of training for producing, harvesting and managing post-harvest challenges.

After initial sorting, grading and packing at farm level, the market agent transport the mangoes to a processing facility or pack houses. Currently, only 4-5 processing facilities exist within the country for fresh mangoes – too few to develop a thriving export market. The processing facility is owned and operated by the exporter. With the exception of one facility, the processing plants service the owners produce, as well as that of other exports. This ensures viability of the processing facility, as well as an additional revenue stream.

Services provided by the pack houses are:
- Hot water or vapour treatment to wash and clean
- Sorting
- Sizing
- Packing in exporters branded box
- Cold Storage

Packaged produce is then transported to the relevant port for shipment. The figure below encapsulates the key steps in the export value chain:

Figure 1: Export Market
Exporters have contracts from customers / importers, which are then fulfilled after the mangoes have been graded and processed.

The industry primarily works on credit, and hence trust plays a significant part in contracts with customers. Given perishability of the product, banks are hesitant to provide discounting services to exporters – this is a service that is often needed by exporters.

Off the 1595 varieties of mangoes known globally, only 25 to 30 are being grown at commercial scale (ICCI 2010). In Pakistan, 250 varieties of mango are found while most important commercial cultivars are Dasehri, Anwar Ratul, Langra, Chaunsa, Sindhri, Maldha, and Fajri Global cultivars include varieties like Haden, Tommy Atkins, Kent and Keitt (ICCI 2010).

3.2 Chillies
The chillies market structure is somewhat distinct to that of the mangoes market, and essentially mirrors the traditional wholesale markets present across all horticulture markets in Pakistan. Chili is grown on 63,000 hectares in Pakistan with a crop yield of 2.7 tons per hectare and an annual production of around 171,000 tons. Three districts in Sindh–Badin, Mirpurkhas and Umerkot– represent the national clusters of red chilies production. Kunri, a small town in Umerkot, contributes around 85% of these chillies and is rightly known as one of the largest production centres for red chilies in Asia.

Approximately 90 percent of Pakistans’ agricultural produce (by value) passes through the wholesale markets or mandi’s, as they are locally known. Similar is the situation with chillies exports. Unlike mangoes where farm production is bought six months in advance, chillies for export are contracted by exporters / traders at the time of harvest, generally from the land owner, and in certain instances from the mandi. Exporters and processors interested in quality product often source their product either from mandi or directly from growers who can deliver quality.
A 2010 study conducted by Mckinsey identified the root cause of under-performance in Pakistan’s horticulture sector to be “the current market structure which is caught in a cycle of low profitability, low investment, and low productivity” plus the “lack of integration across the value chain”. Pakistan’s wholesale markets for horticulture are at the heart of this sub-optimal market structure.

Pakistan’s current wholesale markets inadequately serve those who are interested in high-quality produce grown to specifications. Traditional markets lack the appropriate infrastructure and expertise to preserve quality that is required for export markets. There is no investment in testing equipment to measure the quality of agricultural products and price them accordingly. Non-transparent pricing is the norm because of the concentration of market power among arthis or intermediaries.

4 Export Market Requirements

4.1 Mangoes

Pakistani exporters export to more than 48 countries throughout the world. The Gulf countries, United Arab Emirates, Saudi Arab and European countries are the primary buyers of Pakistani mangoes, followed closely by the United Kingdom. The United Arab Emirates (UAE) has emerged as the top export destination for Pakistani mangoes as they imported about 35,5797 tons in 2017. United Kingdom (UK) was the second top importer of Pakistani mangoes, as it imported 11,388 tons (ITC 2014).
Figure 3: Export of Mangoes from Pakistan

Source: - ITC Trade Map

The export of mangoes follows the Pakistani diaspora that is settled overseas as Pakistani mangoes are primarily demanded by South Asian consumers. Very little work has been done to develop the market for Pakistani mango for the non-Pakistani diaspora.

Each of these markets has its own requirements with regard to varieties, quality and maximum residue limits (MRL’s) but overlying these requirements are the quarantine or market access requirements of each country/market.

There are essentially two types of markets – markets with phytosanitary protocol requirements (‘phyto’ markets) and markets with no phytosanitary protocol requirements (open markets).

Examples of open markets are Hong Kong and Singapore. Mangoes exported to these markets do not need any specific treatments by the grower or exporter. Other markets have no specific treatment but do require a phytosanitary certificate to attest that the consignment has been checked and is free of pests and other extraneous material (e.g. dirt, weed seeds).

‘Phyto’ markets are those that have specific condition on mango exporting, for example, the United Arab Emirates has a phytosanitary protocol which requires a cut test to demonstrate consignment freedom from mango seed weevil, or Japan which requires a vapour heat treatment for fruit fly.

Alongside phytosanitary requirement, a number of aspects determine the market for mangoes. Amongst them:

- Flavour profile
- Minimum fibrosis
- Packaging
- Biosecurity measures
- Competitor country products

Table 1: Top Importers of Mangoes, Mangosteens, Guavas (HS-080450)

<table>
<thead>
<tr>
<th>Importers</th>
<th>2013 Imported quantity, Tons</th>
<th>2014 Imported quantity, Tons</th>
<th>2015 Imported quantity, Tons</th>
<th>2016 Imported quantity</th>
<th>2017 Imported quantity, Tons</th>
</tr>
</thead>
<tbody>
<tr>
<td>World</td>
<td>1,602,638</td>
<td>1,557,185</td>
<td>1,572,922</td>
<td>No Quantity</td>
<td>1,923,026</td>
</tr>
<tr>
<td>United States of America</td>
<td>436,108</td>
<td>385,807</td>
<td>405,965</td>
<td>-</td>
<td>508,904</td>
</tr>
<tr>
<td>Netherlands</td>
<td>147,174</td>
<td>162,155</td>
<td>170,849</td>
<td>196,886</td>
<td>189,731</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>33,984</td>
<td>53,375</td>
<td>28,850</td>
<td>39,877</td>
<td>179,632</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>56,228</td>
<td>59,641</td>
<td>71,524</td>
<td>82,937</td>
<td>84,901</td>
</tr>
<tr>
<td>Germany</td>
<td>56,223</td>
<td>65,725</td>
<td>72,836</td>
<td>73,649</td>
<td>84,069</td>
</tr>
<tr>
<td>China</td>
<td>138,433</td>
<td>89,164</td>
<td>112,921</td>
<td>72,773</td>
<td>76,937</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>57,649</td>
<td>63,668</td>
<td>64,823</td>
<td>54,098</td>
<td>69,572</td>
</tr>
<tr>
<td>Canada</td>
<td>60,312</td>
<td>58,001</td>
<td>56,316</td>
<td>57,117</td>
<td>65,576</td>
</tr>
</tbody>
</table>

Source ITC, Trade MAP

According to ITC Trade Map, world import of mangoes (HS-080450) in 2017 was 1.9 million tons, valued at US$ 2.8 billion, showing significant growth over the previous years. The record indicates an average annual growth in value of 4% over a 5 year period from 2013 to 2017, showing increasing global demand and thus market attractiveness for mangoes, which presents a window of market opportunity for exporters of the commodity.

While UAE and UK continue to be Pakistans’ largest exports of mangoes, Europe and particularly China, in the wake of the China Pakistan Economic Corridor (CPEC), represent an avenue for the growth of Pakistani mangoes. This is discussed in detail further in the document.
4.2 Chillies
Top importing countries of chillies globally are the USA, UK, Netherlands, Germany, Japan, Malaysia and some countries from the Middle East, while Pakistan exports most of its chillies to Saudi Arabia, UAE, Mexico, USA, Kuwait (Workman 2018).

For the export of chillies the most critical requirements from importing countries is control of toxins. In chillies from Pakistan, aflatoxins are a key concern of importing countries. The European Union banned chillies from Pakistan in 2004, due to high levels of aflatoxins. Japan also followed suit.

Aflatoxin is a chemical produced in chillies due to fungal causal organisms i.e., aspergillus flavus and apergillus parasiticus. It develops in chillies during picking, drying, handling, packing, and transportation because of the metabolic activity of fungus, physical rupturing and insect damage. Aflatoxin is one of the sources of primary liver cancer (PLC) in human and animals. The international aflatoxin permissible level is less than five parts per billion (ppb), according to the World Trade Organization.

Hence, the most critical requirement for export of chillies is quality, low aflatoxin levels and meeting of the minimum residue limit standards (TDAP).

5 Challenges and Roadblocks to Export

5.1 Mangoes
As discussed above, significant interventions have been done at the farm level to train farmers to grow and harvest a better quality crop, as well as to manage post-harvest challenges from farm to market.

However, the industry has received minimal support on equipping it to export and connect to not just international markets, but more critically, the international consumer. Hence, the large majority of challenges that are currently limiting export of mangoes, gear around market access, market connectivity and marketing

5.1.1 Institutional Support and Connectivity
The Trade Development Authority of Pakistan (TDAP), under the auspices of the Ministry of Commerce, is tasked with the promotion of trade for Pakistani exporters and importers by improving market access and trade diplomacy. TDAP is the successor organization to the Export Promotion Bureau (EPB) and is mandated to have a holistic view of global trade
development rather than a singular ‘export promotion’ perspective of its predecessor. Designated as the premier trade organization of the country, TDAP manages trade policy initiatives, sector development for export industries, trade delegations, as well as trade exhibitions, both local and internationally.

TDAP is responsible for innovative and proactive marketing to achieve export growth through interaction and coordination with public and private sector stakeholders, and enhancing value of products and services by broadening the export base of Pakistan’s products. Additionally, TDAP is also tasked with enhancing capability and capacity of the supply base of goods and services by fostering supportive export culture and facilitation; and by encouraging export oriented foreign investment and joint ventures.

In parallel, Pakistan Horticulture Development and Export Company (PHDEC) has also been set up under the control of Ministry of Commerce. PHDEC was established in 2003 to support the horticulture sector of the country. However, it has had a rocky past, and mismanagement has rendered it historically ineffective. In 2017, the company was re-structured and re-invigorated with the appointment of a non-political CEO, and is now poised to deliver on its two-pronged strategy for the development and export of horticulture products of Pakistan. It has been mandated with the responsibility of interventions into the areas of production, development and exports by the Ministry of Commerce. The key scope is to develop, promote and enhance Pakistan’s horticulture products by introducing Pakistan to the higher-end international and regional markets through timely, well integrated and strategic initiatives and interventions. This includes capacity building and facilitation of investment to elevate the horticulture industry to an internationally competitive and compliant industry.

And herein lies a key issue of overlap and ambiguity of domains and responsibility. With the presence of TDAP and now PHDEC, the jurisdiction and responsibility of horticulture export promotion becomes ambiguous. While TDAP is the body tasked with an overarching goal of trade development for all of Pakistan’s products and services, with the activation of PHDEC, confusion now exists over who is responsible for promotion of exports for horticulture products. Hence, clarity of roles is absolutely critical, to ensure that focus remains on development of the horticulture sector, and also, that the exporters understand and have the clarity of which organization to work with to enable them to be competitive internationally.
5.1.2 Country Branding

Emerging Pakistan is an initiative by the Ministry of Commerce, to highlight and promote the opportunities available across key sectors, and to deliver the message to the world that Pakistan is open for business. Through this initiative the Government aims to interact with importers, investors, individuals, tourists and corporations who are interested in joining Pakistan’s journey to prosperity. (Commerce 2017)

However, this initiative has numerous limiting factors for agriculture. It is primarily an all encompassing digital campaign, and hence has limited reach. Most critically, it utilises a blanket approach and hence does not deliver a unique proposition or a reason to believe for importers of horticultural or agricultural produce from Pakistan. Given the reach of media, negative publicity about the country has far outweighed any positive information. Hence the absence of clear cut imaging and positioning about Pakistan’s agricultural produce renders products non competitive in the face of competitor country branding. For example, Australian produce is marketed on the back of the clean green positioning of its agricultural sector. Similarly, Netherlands agriculture is positioned as the most innovative and advanced, producing par excellence quality sustainably.

The lack of a unique positioning highlighting the competitive advantage of Pakistan’s produce means that horticultural products comes under the banner of the other negativities highlighted by media.

5.1.3 Marketing and product branding

Example of mango marketing to an international consumer.
Source: The Australian Mango Industry Association (AMIA)
To date, majority of the mangoes exported are targeted to the Pakistani diaspora. It is the expat Pakistanis living in different corners of the globe that demand the familiar taste of the Pakistani mango. Pakistani varieties are sweeter and more aromatic than their global counterparts. There has been minimal effort with even less success in marketing the Pakistani mango to a non-traditional consumer.

So far, TDAP has been the institution responsible for marketing of the produce. Focus has been on trade missions and trade fairs, which though important, do not cover the entire spectrum of the consumer journey. TDAP has been supporting current and potential exporters through organising them and facilitating them to attend the various global fairs like Fruit Logistica in Berlin, Gulf Foods in the UAE, SIAL in Canada etc. However, exhibitors comment on the lack lustre stalls set up by TDAP as compared to the spectacular stalls of competitor countries. But more critically, buyers purchase where a demand exists. Unfortunately, no work has been undertaken to engage international consumers with Pakistani mangoes. In fact, beyond the Pakistani diaspora, few know the existence of mangoes from Pakistan.

During the tenure of EPB, in 2003, EPB worked with the UK based trade commission to introduce mangoes to Harrods, in an effort to promote Pakistani mangoes. While this was a step in the right direction, it was again targeted to the Pakistani diaspora.

Interventions to engage with international consumers have been non-existent and this reflects itself in the low offtake of Pakistani consumers by the international consumer. While they are aware of mangoes from Thailand and Mexico, the Pakistani mango continues to be absent from the purchase set of the international consumer.

Organizations like SMGE, led by Mr. Mahmood Nawaz, have made the effort to go beyond the basic trade channel of trade exhibitions and engage directly with retail chain stores like Tesco overseas and had some success in placing their product in store. But the buck stops with the consumer. Critical elements in this effort have been missing. For example, the mangoes made it to the shelves of retail stores like Tesco in the UK, but in a packaging of 12, whereas consumer purchase behaviour entails purchase by piece. Similarly, the Pakistani mango errs on the sweeter and aromatic side as compared to mangoes available from other countries. No work has been done to showcase the numerous ways in which the Pakistani mango can be made part of the international consumers table and cuisine. A look at the introduction of exotic

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horticultural products in the international consumers table will show that consumers are shown how to use the produce through influencers in the food industry, as well extensive taste testing is conducted through a range of channels like retail outlets, cooking shows, etc. Cases in point is the avocado, which is traditionally part of the Mexican cuisine, bok choy, traditionally part of Chinese cuisine and miso paste from the Japanese cuisine. These exotic products are now seen as part of regular Australian consumption through aggressive consumer and trade level promotions. The case of the Pakistani mango is still wanting for consumer level interaction.

Stemming from lack of understanding of the critical nature of marketing, product branding is also generally lacking in mangoes. This unfortunately is the case across all horticulture products from Pakistan. While purchase behaviour of consumers does not show an active purchase decision based on brands positioned on provenance, a brand is a reflection of quality that the product delivers. The positioning of the product or brand that is established over years, then translates into a price premium for the product, benefitting the stakeholders across the value chain.

TDAP has launched a mango diplomacy program - a program that works with Pakistans’ overseas diplomatic missions to showcase mangoes to the diplomatic core at various engagements. This is a step in the right direction, though a drop in the ocean, to enable the international consumer to not only develop and awareness of Pakistani mangoes, but also to taste and understand the various ways in which they can be utilized.

5.1.4 Logistics
The mango season that starts from Sindh and then moves on to Punjab varieties is approximately 2 months long. Mangoes are harvested green and after ripening, have a 4-5 days shelf life. Essentially that means from harvest to consumption is an approximate 30 day time period, which puts the pressure on transport.

Mangoes have primarily been shipped by air to export destinations. Being an expensive proposition is an obvious concern. However, the larger more significant challenge is the monopoly of airlines, particularly the national carrier PIA. Limited airlines dock in Pakistan, limiting options for exporters, creating a monopoly like situation in relation to pricing. Including the national carrier, only 7 airlines land in Pakistan, limiting choices for exporters.
From July to August, the peak time for exporting and hence peak demand, airlines sharply increase per kilogram shipping rates. PIA, instead of playing a supportive role, has the sharpest increase in prices, often artificially increasing prices by creating an artificial space shortage. Exporters are paying close to Rs. 170 per kilo versus their Indian competitors who pay approximately Rs. 90 per kilo. This translates to non-competitive pricing for Pakistani mangoes.

The airport is also ill equipped to handle exports efficiently - from staff handling the produce to the infrastructure. The absence of cold storage, means that stock is exposed to the elements and quality deteriorates. Exporters are then, not allowed to send product for shipment before 4 hours of the flight, putting pressure on the entire logistics framework. A delay in shipment, if any, means deterioration of product quality, leading the exporter to find a market to dump their product.

5.1.5 Post-harvest supply chain
While significant development interventions have been undertaken at farm level to work with farmers to grow and harvest better quality mangoes, the post harvest supply chain requires significant work and intervention.

Working through the post harvest value chain, a handful of companies in Pakistan are equipped to handle post harvest requirements of the crop as well as export market requirements. Companies like Iftekhar Ahmed and Co., Durrani Farms, SMGE are entities that are well equipped with vapour or hot water treatment plants, sorting, grading and packing expertise, pulping and cold storage facilities. These are also the few companies that are growers as well as exporters and have the knowledge to work through bio security, phytosanitary and MRL (minimum residue limit) requirements of exporting countries. However, on a wider scale, farmers are simply not equipped to export. From the know how, to access to post harvest logistic requirements like cold storages, are missing for the smaller farmer. In fact, often the
beneficiaries of numerous market driven interventions are repeatedly the same small number of large farms. Near farm facilities to service the smaller farmer and make them export ready are hence, required to expand the repertoire of mango exporters to small and medium sized enterprises.

5.1.6 Complacency
By far, the most significant, and the most challenging of issues is that of the mind set of growers. Growers are not driven to export as the domestic markets consume 90% of the mango produced, giving them a liveable income. The extra effort required in growing a better crop and maintaining international standard post harvest protocols are not worth them getting into. Efforts by TDAP to expand their scope to smaller farmers has not born fruit. The pertinent question here would be, “what’s in it for the farmer to export”. Since the domestic market consumes majority of the mango production, farmers are not pushed to engage into export activities as they do not understand the benefits versus the costs and processes involved. Farmers, as well as traders that operate in the domestic market, are, for the large part not equipped with the knowhow to export and hence really do not want to engage as they do not see the price benefit. Discussions with TDAP reveal that the institution puts forth numerous proposals. However, they say they are faced with lack of response from the private sector.

An increase in exports of mangoes, at the very core, requires the will of farmers and traders to export, based on evidence of benefit and profitability.

5.2 Chillies
5.2.1 A market that does not reward quality
The industry currently generally lacks a credible, internationally recognized testing and certification mechanism (Saeed 2016). Therefore, throughout chilli production, as in the rest of the agriculture sector, there is no agreed standard or means of testing quality. The sector is also strife with a high variation in product quality. Hence, exports to markets which place a premium on quality are driven by the efforts of individual exporters.

Further, the link between farmers and quality-conscious buyers is broken. Since the current agricultural value chain does not reward farmers for producing a high quality product, farmers have little incentive to make extra efforts through the lifecycle of the crop cultivation to ensure quality from cultivation to post harvest and then delivery to the market. Most of the profit is taken by the middleman or arthi who not only plays the role of purchaser, but often, also of
financier to the farmer in times of resource constraints. The middlemen are helped by a lack of quality testing in the traditional markets, mixing of qualities along the logistical chain, and delayed payments. Middlemen deny farmers a higher price and timely payment. They also take advantage of processors by mixing commodity of various qualities in the hope of slipping past processors’ in-house testing outfits. Farmers therefore have little incentive to deliver higher quality produce.

5.2.2 Market access
Market access is a key barrier for farmers under the traditional wholesale market system in the agriculture sector, middlemen capture a significant portion of the value of the produce. Every rupee gained by middlemen is a loss to the farmer.

5.2.3 High toxin levels and low quality production
High aflatoxin levels are a result of farmers not being able adapting to good agricultural practices. High toxins are one of the leading causes limiting Pakistan’s chilli exports. Aflatoxin is a fungus that results from poor post harvest practices of drying on bare ground. Public sector extension services are dysfunctional therefore most farmers do not receive on-farm training for crop management.

5.2.4 Value Addition

Creating value added products out of mangoes is the surest way to ensure year round continuity and supply of Pakistani mangoes. Value additions of mangoes includes pulp which is used in juices, nectars, jams and confectionary, condiments, as well as dried / preserved mangoes that categorise as confectionary.

Global markets outlook report that the Global Mango Puree Market accounted for $995 million in 2017 and is expected to grow at a CAGR of 8.7% to reach $2.110 billion by 2026. Some of
the key factors such as mango puree widely used in making drinks, juices, jams and nectars, increasing consumption of mangoes across the globe are driving the market growth. India controls 63% of the world market and 70% of its exports goes to Middle East, 12% goes to Europe and North America takes 5%.

According to a new market report published by Transparency Market Research in 2018, the global processed mango product market is expected to reach US$ 2.043 billion and US$ 31.6 billion for primary processed mango product and secondary processed mango product respectively by 2026, expanding at a CAGR of 6.1% and 7% respectively from 2018 to 2026 (Research 2016).

These numbers represent a very large opportunity for Pakistani mangoes to value add to the mango crop and be able to move away from the distressed sale mind set that exists due to the perishability and limited season of the fruit, compounded by availability of air shipment options. Pulp, dried / dehydrated mangoes are processed product areas that the industry can explore.

Currently, the value added segment in Pakistan is limited to 2-3 pulping plants that service the local (though multinational) juicing industry players like Nestle, Coca Cola and Pepsi-co. Mangoes are also used in pickling in Pakistan, as well as the entire sub-continent region. However, limited data exists on market size and its local and global potential.

With the projected growth of the processed mango market, it is worth investigating the segment deeper to understand the areas of opportunity. Mango pulp, though represents a low hanging fruit (quite literally!) for the mango producers with setting up of near farm facilities. While progressive companies like Iftekhar Ahmed and Company have set up state of the art pulping facilities in Sindh and Punjab, the opportunity for the industry exists to set up pulping and processing facilities near farms to facilitate production from smaller farms.

6 The CPEC Opportunity
China-Pakistan Economic Corridor (CPEC) is a framework envisioned for regional connectivity, potentially not only benefitting China and Pakistan but also having a positive impact on Iran, Afghanistan, India, Central Asian Republic, and the region. The enhancement of geographical linkages through improved road, rail and air transportation system is projected
to increase trade and businesses within the region, along with producing and moving energy to have more optimal businesses resulting in a well connected, integrated region of shared destiny, harmony and development.

The CPEC is a hope of a better region of the future with peace, development and growth of economy. However, the benefits of CPEC for Pakistan's trade are yet to be seen. Focus areas for CPEC are:

- Integrated Transport and IT systems including Road, Rail, Port, Air and Data Communication Channels
- Energy cooperation
- Spatial layout, functional zones, industries and industrial parks
- Agricultural development & poverty alleviation
- Tourism cooperation & people people communication
- Cooperation in livelihood areas
- Financial cooperation
- Human Resource Development

A lot of hope resides in the wake of CPEC for development of trade avenues for the country, particularly for agriculture. However, the immediate focus for CPEC stakeholders is infrastructure and energy/power. Agriculture rests lower down the priority chain of CPEC. CPEC, though, does represent a huge window of opportunity for local businesses, provided that the country, and businesses navigate the wave to push our products forward towards the 1 billion strong Chinese market and ensure that transport that is destined for Pakistan with Chinese goods is loaded with Pakistan's agricultural produce, specially given that the CPEC highways and rail networks, as shown in the figure below, pass through Pakistan's agricultural belt.
Chinese consumption patterns have changed very rapidly and the demand for high quality imported food items in China is growing at a rapid pace. Agricultural development is one of the seven areas of cooperation under CPEC, where China is specifically focused to explore the agricultural productivity, efficient irrigation and post-harvest infrastructure along the CPEC route.

Figure 4: China’s import of mangoes

A 2014 Teradata International Study shows that China imports 12 million to 18 million kgs of mangoes a year. Majority of these imports are from Myanmar, which is a seasonal, regular and low price supplier to China. This is the size of the opportunity that the China market represents, not only for mangoes, but for all agricultural commodities.

The Pakistani government and private sector have placed mango on priority for trade to China.
The authorities are negotiating to remove tariff and non-tariff barriers for mango trade. The private sector has started exploring viable market opportunities in the Chinese market and begun to forge partnerships with international firms to gain a foothold. Several workshops and studies relating to the post-harvest technology to improve mango variety and quality have been conducted by the Quarantine and Sanitary Protocol Inspectors in coordination with the Trade Development Authority of Pakistan.

Nine Special economic zones are planned under CPEC (Pakistan 2017). Unfortunately, only one of them runs through an agriculture focussed area - Moqpondass SEZ Gilgit-Baltistan. For CPEC to benefit Pakistan’s agriculture, special economic zones focused on areas that pass through agriculture belts, is important. These zones can provide centralized services for surrounding farmers to access better production, harvest, post harvest and near farm processing services and facilities to enhance output and access markets that they are currently unable to engage in.

7    Recommendations

7.1    Mangoes
Stemming from the key challenges being faced by the mango industry to export, key policy and institutional reform recommendations are below.

1. Agriculture focused country branding – Pakistan has the largest contiguous irrigation system, some of the most fertile soils in the world, and climate that supports a diversity of crops, lending itself to produce world class quality and tasting produce. Pakistan’s agricultural landscape consists of 8.2 million farmers, 90% of whom are under 12.5 acres, and 65% of them are small landholdings of under 5 acres. Driven by limited resources, this means that Pakistan has low usage of chemical inputs, delivering a more nutritious product, and in many cases an organic product.

Country branding for agriculture will develop the image of Pakistan as a producer of quality agricultural produce, enabling long term export development of a range of agricultural commodities.

2. Targeted marketing and branding through the consumer chain – Europe and China represent an opportunity for increasing of mango exports of Pakistan to an international
audience beyond the Pakistani diaspora. The key initial step is to clarify jurisdictions between TDAP and PHDEC and then develop long term targeted and on-going marketing programs focused on the international consumer experiencing the Pakistani mango. This would include working with international retail channels, as well as demonstrating usage of and tasting of Pakistani mangoes.

Stemming from this should be to equip exporters to develop company or region brands to assure importers of a stamp of quality.

3. Near farm agri development hubs – To equip smaller farmers to export, and hence expand the footprint of exporting farms and stabilizing supply for exportable commodities, it is recommended to develop agricultural hubs near farms. These are applicable to mango regions, as well as for regions of other horticultural and agricultural commodities. The agri hubs will act as regional support centres, providing export readiness trainings and certification (GAP etc.), transport, centralized sorting, grading, packing and value addition processing and cold storage facilities so that every farmer has the opportunity to deliver a better product for the market. By equipping farmers to process and export with ease, more farmers will enter the export arena overcoming the mental barriers on exporting. These hubs should be developed along the lines of public private producer partnerships (PPPP) and be based on financially sustainable and for profit models and regional provenance pack house brands can develop from these hubs.

4. CPEC – Special agricultural economic zones – The concept of special economic zones is being established along the CPEC. However, they are not primarily focused on agriculture, but rather along industry and and energy / power. To enable mango farmers as well as other crop farmers to benefit from CPEC, special economic zones focused along the agriculture regions that CPEC passes through, should be developed. The node cities that the corridor passes through include Kashgar, Atushi, Tumshuq, Shule, Shufu, Akto, Tashkurgan Tajik, Gilgit, Peshawar, Dera Ismail Khan, Islamabad, Lahore, Multan, Quetta, Sukkur, Hyderabad, Karachi and Gwadar. In the Pakistan end of the equation, it passes through key agricultural belts. Similar hubs as discussed in point 3 should then be set up in these special economic zones.
Negotiations for removal of tariff and non-tariff barriers are already underway but the focus on agricultural aspect of CPEC needs to be prioritized rather than placed lower on the ranks of priorities.

5. Government intervention to support air shipment – While the Pakistan government cannot dictate pricing terms to international carriers, they can mandate a fair pricing policy for the national carrier for the development of mango exports. Additionally, the air and sea ports need to be equipped with the basic infrastructure required to export perishables, starting with cold storage, and handling knowledge of the staff processing the shipments.

7.2 Chillies
By and large, the recommendations identified for mangoes are also applicable to chillies, except for the need for targeted marketing, since it is not a sensory crop.

Interventions have been undertaken by stakeholders in the chilli value chain and government and non government agencies to deliver transformative changes in chillies production and market access. Along with Sindh Enterprise Development Fund (SEDF), USAID and Pakistan Mercantile Exchange (PMEX), Pakistan Agricultural Coalition (PAC) has trained farmers in Kunri to dry chillies on geotex material to minimize aflatoxins. To systemically handle the issue of quality and market access, PAC, with PMEX and the guidance of Securities Exchange Commission of Pakistan has piloted an eco system that brings quality and standardization into the arena, rewards farmers that produce better quality, in the form of better pricing, and gives market access to the farmers through an electronic trading platform on the PMEX platform.

The following excerpt and figure from PACs Trading Platform Manual explains the workings and process of the electronic trading:
“The “e-Trading platform” for agri-commodities developed by PMEX and PAC with SECP guidance and supervision, provides the solution to the farmer’s market access problems: (i) world class testing of agri-commodities right at the farm gate so that only that product is lifted which is acceptable to quality-conscious buyers (particularly food processors, exporters, etc.), (ii) electronic trading on PMEX based on the test results, (iii) farmer mobilization and facilitation, and (iv) electronic payment within 48 hours on PMEX (see annex for process flow). SGS Pakistan\(^2\) has been the testing partner in this effort so far.

The services which constitute this model—e-trading services, world class testing, and farmer mobilization are covered by a transaction charge—half paid by the buyer and half by the seller. This business model was piloted with red chillies in 2015 and scaled up in 2016 when $3.5 million worth of quality-tested red chillies were traded on the e-trading platform. In November 2016, this model was successfully piloted for rice paddy purchases at Muridke in District Sheikhupura where some 4,000 tons of paddy were tested at the farm gate by SGS Pakistan which allowed farmers to receive better prices. A brief video about the e-trading platform is available [here](#).

Real price discovery for high-quality products will come from export transactions on PMEX. Work is currently underway to set up the exchange for export transactions, hence, an opportunity for chilli farmers, processors and exporters to enlist their products on the exchange electronically.

Hence, by scaling up the current work around aflatoxins and market access through electronic trading, Pakistan can potentially increase the export of chillies and realise its potential.

8 Conclusion
The horticulture sector in Pakistan is one of the most important opportunities for the country to engage in higher value exports. It is aided by favourable climatic conditions, arable soil and

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2 SGS is one of the world’s leading inspection, testing, verification, and certification companies and the market leader in Pakistan ([www.sgsgroup.pk](http://www.sgsgroup.pk))
a contiguous irrigation system to be amidst the top 5 producers in a range of horticultural crops. Pakistan is powered by an innovative private sector and strong business acumen. The key ingredient to success now is the political will to ensure that its horticultural strengths are leveraged to create world class exportable produce and value added products.

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