



USAID
FROM THE AMERICAN PEOPLE



Together we will create a *ROSHAN PAKISTAN*

THE AGRIBUSINESS PROJECT (TAP)

Banana- Value Chain

Competitiveness Assessment



The Agribusiness Project - Agribusiness Support Fund

A company incorporated under section 42 of the companies ordinance 1984.

Disclaimer: This document is made possible by the support of the American people through the United States Agency for International Development (USAID). The contents are the sole responsibility of the Agribusiness Support Fund (ASF) and do not necessarily reflect the views of USAID or the United States Government

Banana- Value Chain Competitiveness Assessment

Published by The Agribusiness Project, with the funding support of United States Agency for International Development, under Agribusiness Support Fund, Pakistan.

©ASF-TAP Banana Assessment

Islamabad, Pakistan

Report Developed By:
Asad Zahoor and Marcos Arocha

Consultant (STTA) - The Agribusiness Project Islamabad, Pakistan

Supervised by:
Ayesha Gulzar, National Coordinator, The Agribusiness Project

Consultation team:
Value Chain Lead, The Agribusiness Project
Regional Team, The Agribusiness Project
Field team, The Agribusiness Project

Design and Layout by:
EVENEMENT

This report is a live document which can be changed/updated as the project progresses. Any suggestions for further improvement are most welcome.

For more information

Email: info@agribusiness.org.pk, website: www.agribusiness.org.pk

Email: info@asf.org.pk, website: www.asf.org.pk

ACKNOWLEDGEMENTS

This report encapsulates the results of the Banana Value Chain Competitiveness Assessment (VCA) study undertaken by the USAID Agribusiness Project (TAP). The authors wish to thank all the associated organizations and their project staff for their valuable contributions particularly the TAP value chain leads and the field staff for their tireless efforts spent during the data gathering in the field.

TABLE OF CONTENTS

Acknowledgements IV	
Acronyms and AbbreviationsV	2
I. Background	3
Introduction	4
Importance of Banana:	8
Global Banana Production	8
Pakistan Banana Production Base	9
II. Market Trends	17
Domestic markets	17
World Banana Exports	17
Pakistan Banana Exports	19
World Imports	22
III. Structure of the Banana Value Chains	23
IV. Constraints affecting Value Chain Competitiveness	27
V. Conclusions, Recommendations & Proposed Interventions	30
Conclusions	30
Recommendations	32
Proposed Interventions	33
Annex A: List of Sources, List of Interviews and List of Validation Workshop Attendees	36
Studies and Literature Reviewed/Knowledge Sources Consulted	
List of People Interviewed	
List of Participants, Validation Workshop with Stakeholders of Banana Value Chain	
Annex B: Cost of Banana Production	38
Annex C: Pakistan Banana Value Chain Situation in Comparison with Indian Banana Value Chain	42

FOREWORD

A series of Training manuals, Guide Books and Reports have been developed by The Agribusiness Project (TAP) to facilitate the capacity building of farmers involved in TAP's targeted value chains, thereby enabling them to make the requisite transformation from 'subsistence farming' to 'farming as a business enterprise'. The Agribusiness Project is funded by USAID/Pakistan, with the overall goal of supporting improved conditions for broad-based economic growth, enhance profitability and employment opportunities and contributing to poverty alleviation through product and process transformation of selected value chains in horticulture and livestock sub-sectors. The strategy of TAP focuses on:

1. strengthening capacities in horticultural and livestock value chains to increase sales to domestic and foreign markets;
2. strengthening the capacity of smallholders (through farmer enterprise groups-FEGs), individual farmers and agribusinesses to operate effectively and efficiently; and,
3. increasing productivity and profitability through adoption of new techniques and technological innovations (among farmers, agribusinesses and business development services providers).

Through TAP, farmers have been organized as Farmer Enterprise Groups (FEGs) for cultivating the benefits of scale, through optimized production and marketing, and serving as a vehicle for transferring of the benefits of TAP interventions to its stakeholders - the farmers. TAP is providing active support to the FEGs and farmers for improving small producers' positioning in a value chain through support in incorporating producers and their product into stable, profitable market channels, and provision of necessary services and assistance in business development, planning and marketing through inter-linkages. This requires intensive capacity building of the stakeholders placing capacity building at the heart of all interventions.

This report/Manual can be used by anyone involved with the production, cultivation, harvesting and enterprise development training of and for farmers/farmer business groups. The contents have been finalized with the consultation of stakeholders engaged with the value chains.

While these Reports/Manuals/Guide Books are project specific and for a farmer audience, they can also be used for the capacity building of government and non-government agency representatives, processors and exporters who are involved in implementing production/cultivation, enterprise development and value chain programs, through the communities. Finally, I want to thank USAID/Pakistan for funding The Agribusiness Project under which this intellectual capital has been prepared. I would also like to thank ASF for successfully implementing these manuals/guide books across Pakistan for the benefits accrued to the farmers.

Shad Muhammad
Chief of Party
The Agribusiness Project | ASF
Islamabad, Pakistan

THE AGRIBUSINESS SUPPORT FUND

ASF is a 'not-for-profit' company registered under Section 42 of the Companies' Ordinance 1984 with Securities & Exchange Commission of Pakistan (SECP). ASF has extensive experience in strengthening and supporting demand-driven private sector service delivery mechanisms throughout the agribusiness value chain this includes supply inputs, production and export markets. ASF aims to achieve this objective by mobilizing angel investment grant provision and technical assistance support of farmer and agribusiness enterprises. The company supports start-ups as well as existing enterprises, enabling them to employ modern technique and practices and build expertise and markets understanding required by a fast-changing economic environment and to improve their productivity, profitability, competitiveness and creditworthiness.

THE AGRIBUSINESS PROJECT

The Agribusiness Project is an initiative of the United States Agency for International Development (USAID) and the Agribusiness Support Fund (ASF) Pakistan. The project aims at enhancing competitiveness of agricultural value chains in Pakistan, with a focus on Horticulture and Livestock including dairy, meat and fisheries. The objective of The Agricultural Project is to support and create improved conditions for poverty alleviation. Since Pakistan's economy is agrarian in nature, The Agribusiness Project aims to invest in interventions at the primary, secondary and tertiary levels of production. Under the International Market Access Program (IMAP), the project supports the creations of linkages between exporters and importers. The objective is to facilitate market access and enable trading linkages which translates into agribusiness through trade.

ASF	Agribusiness Support Fund
FAO	Food and Agriculture Organization of United Nations
FEG	Farmer Enterprise Group
GAP	Good Agricultural Practices
IMLP	International Market Linkages Program
NGO	Non-Government Organization
M&E	Monitoring & Evaluation
SME	Small and Medium Enterprises
SMEDA	Small and Medium Enterprise Development Authority
TDAP	Trade Development Authority of Pakistan
TA	Technical Assistance
UNIDO	United Nations Industrial Development Organization
USAID	United States' Agency for International Development
VCP	Value Chain Platform

Exchange rate used: US\$1 = PKR 105

I. BACKGROUND

The USAID's Agribusiness Project, now commonly referred to as The Agribusiness Project (TAP) is being implemented through Cooperative Agreement (No. AID-391-A-12-00001) by the Agribusiness Support Fund (ASF). ASF, a Pakistani non-profit company registered under section 42 of the Companies Ordinance of 1984 was formed to provide demand-driven technical and managerial assistance and private sector service delivery mechanisms throughout the agribusiness value chains including supply inputs, production, processing, and market access for domestic and export markets.

The five-year TAP project began on November 10, 2011. The overall goal of the project is to support improved conditions for broad-based economic growth, create employment opportunities and contribute to poverty alleviation through increases in competitiveness of horticulture and livestock value chains in partnership with all stakeholders. Specific objectives of the project are to; (i) strengthen the capacity in horticulture and livestock value chains to increase sales to domestic and foreign markets; (ii) strengthen the capacity of smallholders and farmer enterprises to operate autonomously and effectively; and, (iii) increase agriculture efficiency and productivity through adoption of new farming techniques and technological innovation among targeted beneficiaries. The ASF had developed some basic information on many of the selected value chains targeted by the project. This information has been published in the following reports:

1. Horticulture (Peaches, Dates, Potatoes, Chilies) Value Chain Assessment Final Report for the Agribusiness Project (31 December 2012)
2. Dairy Value Chain Assessment Final Report for the Agribusiness Project (24 February 2013)
3. Meat Value Chain Assessment of the Livestock Sector of Pakistan (2 November 2013)

The present report is one of a series resulting from the effort to deepen the analysis provided in these reports by assessing the competitiveness of the selected value chains. These competitiveness assessments focused on the following:

- a) Identification of the precise gaps the potential of Pakistan producers in the selected value chains;
- b) Validate ongoing and planned interventions;
- c) Identification of attractive/alternative markets for the value chain products;
- d) Identify additional interventions that could enhance value for all the chain actors;
- e) Facilitate further prioritization of VCs and of the potential interventions in light of the augmented information and analysis
- f) Subsequent M&E will be facilitated by the information in the assessments

The methodology employed included refining maps of the functions and actors participating in each value chain, identifying variations in each depending on the product and relative efficiency of the different participants, and gathering as much information as possible on prices, costs, and efficiency metrics at each level, as well as volumes of product flowing through each of these channels. In

parallel, world market information was obtained to assess Pakistan's recent performance in each chain's product(s), assess its relative position vis a vis international competitors considering volumes, prices, and recent export growth, and benchmark the gaps between them.

The information sources used include a review of previous studies, interviews with adequate representation of all functions and participant groups in each value chain, including producers, intermediaries (contractors, commission agents, traders (beuparies), exporters, supermarkets, and input suppliers as well as key informants from among academia, research and development professionals. The data presented in the reports primarily come from reports and databases published by the Pakistan Bureau of Statistics, Trade Development Authority of Pakistan (TDAP), Directorate of Market Information, Department of Agriculture Punjab, Economic Survey and other domestic and international secondary sources of information, particularly international databases such as International Trade Center (ITC) in Geneva and FAOSTAT. For each specific chain, various knowledge and information sources available on the worldwide web were utilized as well.

Assistance was provided to the value chain consultant by ASF staff to set up these meetings in the various districts where interviews were conducted. Marcos Arocha, a consultant from JE Austin Associates assisted in the design of the overall framework provided guidance throughout the elaboration of the work.

These documents were designed to focus on the competitiveness of the selected value chains. However, they shouldn't be considered final. They were conducted in a relatively short time given (about 8 weeks) given the previous work done. Nevertheless, VC strategies should be "living documents" and continuously be updated as potential interventions are further tested and more information is uncovered.

Introduction

Banana is an edible fruit produced by several kinds of large herbaceous flowering plants in the genus *Musa*. In some countries, bananas used for cooking are also called plantains. The fruit is variable in size, color and firmness, but is usually elongated and curved, with soft flesh rich in starch covered with a rind which may be green, yellow, red, purple, or brown when ripe. The fruits grow in clusters hanging from the top of the plant. Almost all modern edible parthenocarpic (seedless) bananas come from two wild species – *Musa acuminata* and *Musa balbisiana*. The scientific names of most cultivated bananas are *Musa acuminata*, *Musa balbisiana*, and *Musa* × *paradisica* for the hybrid *Musa acuminata* × *M. balbisiana*, depending on their genomic constitution.

Musa species are native to tropical Indomalaya and Australia, and are likely to have been first domesticated in Papua New Guinea. They are grown in at least 107 countries, primarily for their fruit. In 2013 bananas were fourth among the main world food crops (after rice, wheat, and maize) in financial value.

Worldwide, there is no sharp distinction between "bananas" and "plantains". Especially in the Americas and Europe, "banana" usually refers to soft, sweet, dessert bananas, particularly those of the Cavendish group, which are the main exports from banana-growing countries. By contrast, *Musa* cultivars with firmer, starchier fruit are called "plantains". In other regions, such as Southeast Asia, many more kinds of banana are grown and eaten.

The banana plant is the largest herbaceous flowering plant. All the above-ground parts of a banana plant grow from a structure usually called a "corm". Plants are normally tall and fairly sturdy, and are often mistaken for trees, but what appears to be a trunk is actually a "false stem" or pseudo stem. When a banana plant is mature, the corm stops producing new leaves and begins to form a flower spike or inflorescence. A stem develops which grows up inside the pseudo stem, carrying the immature inflorescence until eventually it emerges at the top. Each pseudo stem normally produces a single inflorescence, also known as the "banana heart". After fruiting, the pseudo stem dies, but offshoots will normally have developed from the base, so that the plant as a whole is perennial. In the plantation system of cultivation, only one of the offshoots will be allowed to develop in order to maintain spacing.

The banana fruits develop from the banana heart, in a large hanging cluster, made up of tiers (called "hands"), with up to 20 fruit to a tier. The hanging cluster is known as a bunch, comprising 3–20 tiers, or commercially as a "banana stem", and can weigh from 30–50 kilograms. Individual banana fruits (commonly known as a banana or "finger") average 125 grams of which approximately 75% is water and 25% dry matter.

Cultivated bananas are partheno-carpic, i.e. the flesh of the fruit swells and ripens without its seeds being fertilized and developing. Lacking viable seeds, propagation typically involves farmers removing and transplanting part of the underground stem (called a corm). Usually this is done by carefully removing a sucker (a vertical shoot that develops from the base of the banana pseudo stem) with some roots intact. However, small sympodial corms, representing not yet elongated suckers, are easier to transplant and can be left out of the ground for up to two weeks; they require minimal care and can be shipped in bulk.

It is not necessary to include the corm or root structure to propagate bananas; severed suckers without root material can be propagated in damp sand, although this takes somewhat longer. In some countries, commercial propagation occurs by means of tissue culture. This method is preferred since it ensures disease-free planting material. When using vegetative parts such as suckers for propagation, there is a risk of transmitting diseases.

As a non-seasonal crop, bananas are available fresh year-round.

In global commerce in 2009, by far the most important cultivars belonged to the triploid AAA group of *Musa acuminata*, commonly referred to as Cavendish group bananas. They accounted for the majority of banana exports, despite only coming into existence in 1836. The cultivars Dwarf Cavendish and Grand Nain (Chiquita Banana) gained popularity in the 1950s after the previous mass-produced cultivar, Gros Michel (also an AAA group cultivar), became commercially unviable due to Panama disease, caused by the fungus *Fusarium oxysporum* which attacks the roots of the banana plant. Cavendish cultivars are resistant to the Panama Disease but in 2013 there were fears that the Black Sigatoka fungus would in turn make Cavendish bananas unviable.

Ease of transport and shelf life rather than superior taste make the Dwarf Cavendish the main export banana.

Dwarf Cavendish and Grand Nain are in no danger of extinction, but they may leave supermarket shelves if disease makes it impossible to supply the global market. It is unclear if any existing cultivar can replace Cavendish bananas, so various hybridization and genetic engineering programs are attempting to create a disease-resistant, mass-market banana.

Ripening

Export bananas are picked green, and ripen in special rooms upon arrival in the destination country. These rooms are air-tight and filled with ethylene gas to induce ripening. The vivid yellow color normally associated with supermarket bananas is in fact a side effect of the artificial ripening process. Flavor and texture are also affected by ripening temperature. Bananas are refrigerated to between 13.5 and 15 °C during transport. At lower temperatures, ripening permanently stalls, and the bananas turn gray as cell walls break down. The skin of ripe bananas quickly blackens in the 4 °C (39 °F) environment of a domestic refrigerator, although the fruit inside remains unaffected.

"Tree-ripened" Cavendish bananas have a greenish-yellow appearance which changes to a brownish-yellow as they ripen further. Although both flavor and texture of tree-ripened bananas is generally regarded as superior to any type of green-picked fruit, this reduces shelf life to only 7–10 days.

Storage and transport

Bananas must be transported over long distances from the tropics to world markets. To obtain maximum shelf life, harvest comes before the fruit is mature. The fruit requires careful handling, rapid transport to ports, cooling, and refrigerated shipping. The goal is to prevent the bananas from producing their natural ripening agent, ethylene. This technology allows storage and transport for 3–4 weeks at 13 °C (55 °F). On arrival, bananas are held at about 17 °C (63 °F) and treated with a low concentration of ethylene. After a few days, the fruit begins to ripen and is distributed for final sale. Unripe bananas cannot be held in home refrigerators because they suffer from the cold. Ripe bananas can be held for a few days at home. If bananas are too green, they can be put in a brown paper bag with an apple or tomato overnight to speed up the ripening process.

Carbon dioxide (which bananas produce) and ethylene absorbents extend fruit life even at high temperatures. This effect can be exploited by packing banana in a polyethylene bag and including an ethylene absorbent, e.g., potassium permanganate, on an inert carrier. The bag is then sealed with a band or string. This treatment has been shown to more than double life spans up to 3–4 weeks without the need for refrigeration.

Statistics on the production and export of bananas and plantains are available from the Food and Agriculture Organization. Some countries produce statistics which distinguish between bananas and plantains, but three of the top four producers (India, China and the Philippines) do not, so comparisons can only be made using the total for bananas and plantains combined.

Bananas and plantains constitute a major staple food crop for millions of people in developing countries. In most tropical countries, green (unripe) bananas used for cooking represent the main cultivars. Bananas are cooked in ways that are similar to potatoes. Both can be fried, boiled, baked, or chipped and have similar taste and texture when served. One banana provides about the same calories as one potato.

Most producers are small-scale farmers either for home consumption or local markets. Because bananas and plantains produce fruit year-round, they provide an extremely valuable food source during the hunger season (when the food from one annual/semi-annual harvest has been consumed, and the next is still to come). Bananas and plantains are therefore critical to global food security.

Bananas are among the most widely consumed foods in the world. Most banana farmers receive a low price for their produce as grocery companies pay discounted prices for buying in enormous quantity. Price competition among grocers has reduced their margins, leading to lower prices for growers. Chiquita, Del Monte, Dole, and Fyffes grow their own bananas in Ecuador, Colombia, Costa Rica, Guatemala, and Honduras. Banana plantations are capital intensive and demand significant expertise. The majority of independent growers are large and wealthy landowners in these countries. Producers have attempted to raise prices via marketing them as "fair trade" or Rainforest Alliance-certified in some countries.

The banana has an extensive trade history starting with firms such as Fyffes and the United Fruit Company (now Chiquita) at the end of the 19th century. For much of the 20th century, bananas and coffee dominated the export economies of Central America. In the 1930s, bananas and coffee made up as much as 75% of the region's exports. As late as 1960, the two crops accounted for 67% of the exports from the region. Though the two were grown in similar regions, they tended not to be distributed together. The United Fruit Company based its business almost entirely on the banana trade, because the coffee trade proved too difficult to control. The term "banana republic" has been applied to most countries in Central America, but from a strict economic perspective only Costa Rica, Honduras, and Panama had economies dominated by the banana trade.

Nutrition and research

Bananas are an excellent source of vitamin B6, soluble fiber, and contain moderate amounts of vitamin C, manganese and potassium. Along with other fruits and vegetables, consumption of bananas may be associated with a reduced risk of colorectal cancer and in women, breast cancer and renal cell carcinoma.

Table 1: Nutritional facts about Banana fruit

Weight (g)	84
Energy (kcal)	37
Fibre content (g)	1.7
Ascorbic acid (mg)	26
Folate (mcg)	17
Potassium (mg)	132

Importance of Banana:

Pakistan produced about 6.8 million tons of fruits in 2011-12. Banana occupies an important position among fruits in Pakistan with 96,545 tons of banana produced in 2012. Banana fruit is 4th leading in term of production after citrus, mango and guava. It accounts for about 1.42% percent of total production of all fruits in the country. It is grown on around 22,098 hectares. Pakistan accounts for about 0.13 percent of the world total production of Banana in 2011 (FAO, Stats). Sindh with 92 percent of national production in 2011 is the centre of production for banana.

Several geographical regions in Pakistan, particularly the plains of the Sindh province and coastal areas of Sindh and Baluchistan provide suitable conditions for growing Banana.

Pakistan's agro-climatic conditions provide a suitable environment for the production of Banana, providing a strong comparative advantage as indicated by the sustained growth over the years. In view of the comparative advantages, it is assumed that the product has further potential for growth in the times to come. As the cost of production data indicate, producing Bananas is profitable for the growers at the present level of productivity and present level of prices.

Global Banana Production:

Banana cultivation is spread throughout the world across 136 countries of the world. The quality of the Banana fruit however varies in different regions. The areas with mild climate in tropical and coastal regions are considered to be the best for commercial production of Banana.

The world produced over 107 million tons of Bananas in 2011. India was the world's largest producer with 36 percent of total world production, followed by China with 26 percent of World Production. Banana is grown in 136 countries of the world. Top 10 countries produced 76 percent of world total production in 2011 (FAO Stats).

Table 2: World Banana Production in 2011

Rank	Countries	Production (Tons)	Yield
	World + (Total)	107,142,187	20.29
1	India	29,666,973	36.32
2	China	10,705,740	26.54
3	Philippines	9,165,043	20.36
4	Ecuador	7,427,776	38.69
5	Brazil	7,329,471	14.56
6	Indonesia	6,132,695	58.87
7	United Republic of	3,143,835	5.9
8	Guatemala	2,679,934	41.68
9	Angola	2,646,073	25.26
10	Mexico	2,138,687	28.79

Chart 1: World Banana Production in 2011: Comparison of Yields

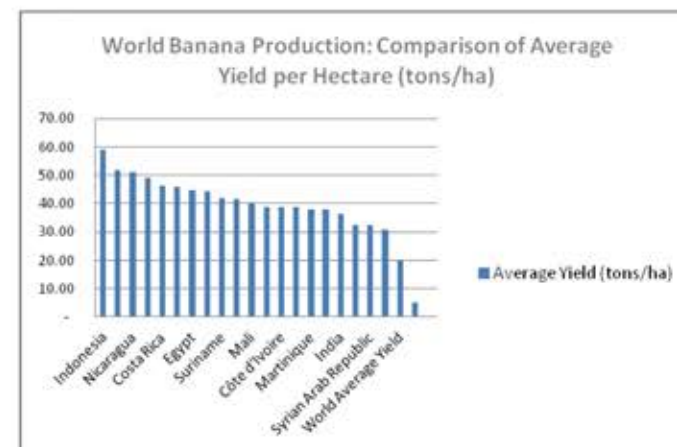
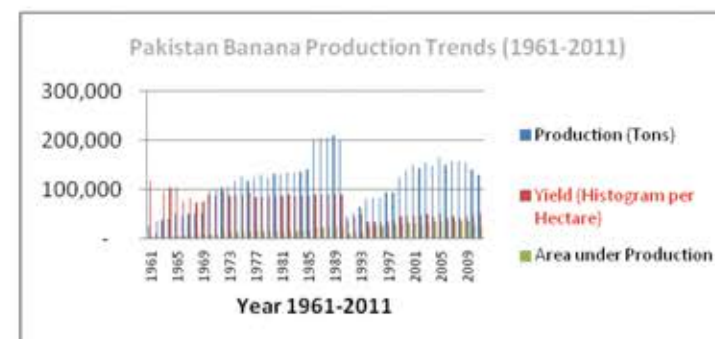


Chart 1 above shows a comparison of banana yield averages of top twenty producing countries in comparison with world average yield and Pakistan average yield. It is worth noting that Pakistan recorded average yield of around 5 tons per hectare is much below world average of over 20 tons per hectare in 2011. It may also be noted Indonesia recorded corresponding spatial yield twelve times that of Pakistan. Most of the top producing countries produced above forty tons from one hectare on average as per FAO records.

Pakistan Banana Production Base:

According to FAO Statistics, Pakistan produce 130 thousand tons of banana in 2011, ranked 49 among the producing countries with average yield of 5.2 tonnes per hectare. If compared with world banana average yield figures, it is interesting to note that Pakistan average yield figures are actually quite low. Pakistan average yield was recorded at 26% of world average yield and only 9% of average yield figure of Indonesia.

Chart 2: Pakistan Banana Production Trends Since 1961

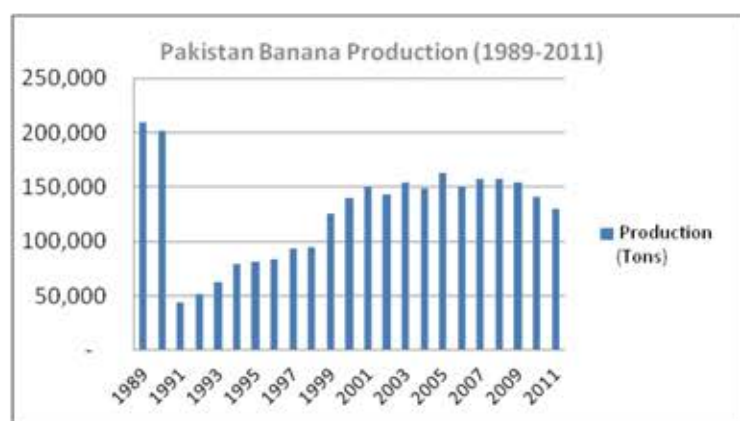


According to Crop Services of Provinces, Government of Pakistan, total banana production in 2011 was slightly over 139 thousand tons and average yield per hectare was 4.75 tons per hectare.

Statistics indicate that growth in Banana production in Pakistan has been quite erratic in the past. Chart 2 above depicts that area under production has been increasing steadily since 1961 with a sharp reduction in 1991 when area under cultivation halved. Yield per hectare also recorded a sharp decline in 1991. Although per hectare yield figures showed an incremental improvement in the next two decades from 1991 levels, yet productivity has not reached back to yield levels before 1991. Similarly overall production in 2011 has not attained level of production attained in late eighties. Whereas the sharp decline in 1991 is indicative a disease attack that destroyed almost the entire plantations in Sindh.

Pakistan banana production suffered a major blow in year 1991. As evident from Chart 3 below, Pakistan banana production has not been able to attain its peak production level of over 209 thousand tons in year 1989/90.

Chart 3: Pakistan Banana Production Trends (1989-2011)



Data from Crop Services of Provinces, Government of Pakistan compiled in Table 3 below depicts trends as shown above.

Table 3: Pakistan Banana Production

	(Tons)				
	2007-08	2008-09	2009-10	2010-11	2011-12
Banana	146,597	146,010	144,006	13,9145	96,545
Total Fruit	7,136,627	7,008,151	6,930,476	6,926,583	6,796,818

Banana is primarily grown in Sindh. Khairpur, Neshero Feroz, Nawabshah, Mirpurkhas, Umerkot, Matiari, Tando Allahyar, Badin and Thatta are major banana producing districts in Sindh. In Balochistan, banana is grown in Khuzdar, Turbat and Lasbella districts (Crop Reporting Services of Province, Government of Pakistan, 2013).

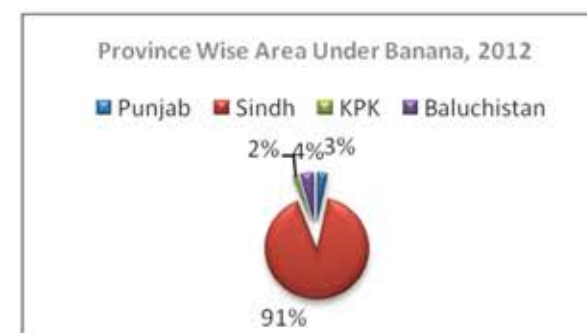
As evident from Table 4 below, and graphically highlighted in Chart 6 below, 91% area under banana production lies in Sindh province.

Table 4: Province Wise Area under Banana Production

	2012	2011
Pakistan	22,098	29,283
Punjab	731	1,216
Sindh	19,756	26,821
KPK	363	361
Baluchistan	940	885

Source: Crop Reporting Services of Province, Government of Pakistan, 2013

Chart 4: Sindh Share in Pakistan Area under Banana Production in 2012



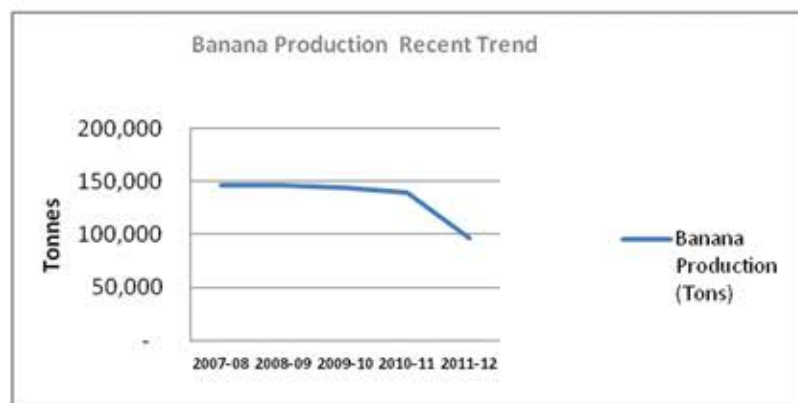
Source: Crop Reporting Services of Province, Government of Pakistan, 2013

Table 5: Banana Production Statistics Sindh

	2007-08	2008-09	2009-10	2010-11	2011-12
Production (Tonnes)	127,024	128,888	127,426	113,410	76,042
Area (Hectares)	32,938	33,445	32,236	26,821	19,756
Yield (Tonnes per Ha)	3.86	3.85	3.95	4.23	3.85

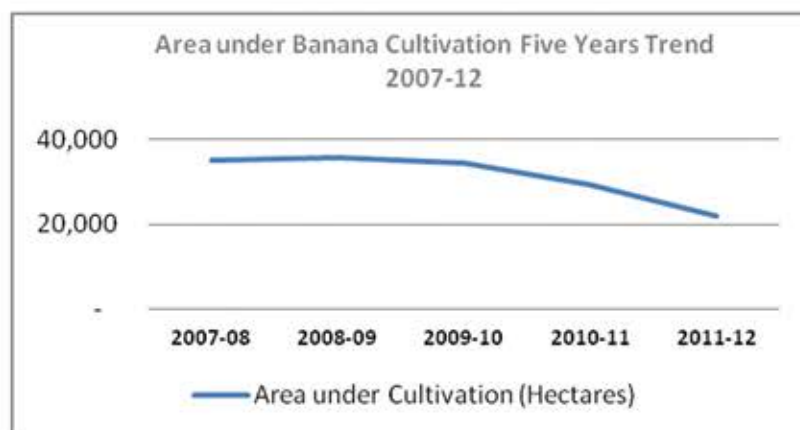
Chart 4 and Chart 5 below depict decrease in area under banana cultivation and corresponding decrease in production since 2010 more recently. The recent decline is attributed to devastating floods in the production areas of Sindh.

Chart 5: Pakistan Banana Production Trends (2007-2011)



Source: Crop Reporting Services of Province, Government of Pakistan, 2013

Chart 6: Pakistan Banana Production Trends (2007-2011)



Source: Crop Reporting Services of Province, Government of Pakistan, 2013

Table 6 below shows province wise banana yield comparison. It shows that per hectare recorded yield in Sindh is the lowest among the provinces in Pakistan.

Table 6: Province Wise Banana Yield Comparison

	2007-08	2008-09	2009-10	2010-11	2011-12
Pakistan	4.16	4.08	4.17	4.75	4.37
Punjab	6.42	6.65	6.75	6.76	6.16
Sindh	3.86	3.85	3.95	4.23	3.85
KPK	29.44	29.45	29.01	28.26	29.11
Baluchistan	18.79	10.91	9.21	5.54	3.22

Source: Crop Reporting Services of Province, Government of Pakistan, 2013

While analyzing production related statistics a major anomaly pertaining to official banana production statistics was noticed. It was observed that the yield per hectare figure reported for the province of Sindh were lower than the corresponding yield figures reported for the province of Punjab and substantially lower than yield figures reported for banana production in the province of KPK. It was striking to observe that yield per hectare for Sindh was reported in the range of 13-15% of yield per hectare from KPK yields in the last 5 years. This appears contrary to ground realities as Banana grown in Sindh is in much favorable conditions than in Punjab or KPK.

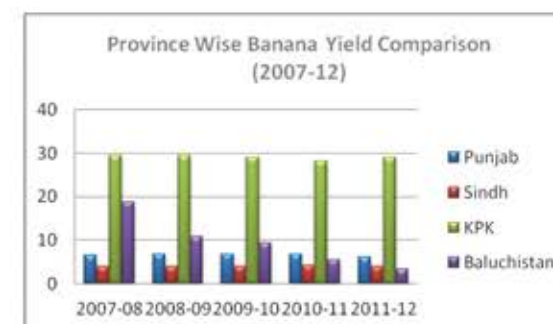
It is plausible to note that since FAO is reporting statistics obtained from the official government of Pakistan sources, the reported pattern of yields is also reported by FAO Stats despite slight variations. In order to understand and validate situation on ground, the author studied district wise production statistics for all the banana producing districts of Sindh. Key informants confirm that the area under cultivation reported by the government of Sindh looks right; however it seems that the banana production figures are not reported correctly. From the comparison of banana yield figures for all the four provinces of Pakistan as reported by the government statistics, a contrast comes out clearly as shown in Table 7 below:

Table 7: Banana Province Wise Yield Comparison (Tons/Hectare)

	2007-08	2008-09	2009-10	2010-11	2011-12
Pakistan	4.16	4.08	4.17	4.75	4.37
Punjab	6.42	6.65	6.75	6.76	6.16
Sindh	3.86	3.85	3.95	4.23	3.85
KPK	29.44	29.45	29.01	28.26	29.11
Baluchistan	18.79	10.91	9.21	5.54	3.22

Source Crop Reporting Services of Provinces

Graphically the contrast of anomaly is depicted in Chart 7 below:



Whereas the statistics reported by FAO Stats also do not exactly match with Statistics reported by Crop Reporting Services of Province and published by Agriculture Statistics, Government of Pakistan as show below in Table 8, there may be justifications for the differences in figures reported by the two official sources.

Table 8: Comparison between FAO and Government of Pakistan Banana Statistics 2011

	Production (Tonnes)	Area under Cultivation (Hectare)	Yield (Tonnes per Hectare)
FAO	130,000	25,000	5.20
Crop Reporting Services of GoP	139,145	29,283	4.75

Source: FAO Stats & Crop Reporting Services of Provinces, GoP

In order to cross check, yield per acre data was collected and compared with official statistics. For ease of comparison, the officially reported yield figures (Tons per Hectare) were converted to "maunds per acre" as shown in Table 9 below:

Table 9: Banana Yield Statistics Conversion

	2007-	2008-	2009-	2010-	2011-
Pakistan	41.6	40.8	41.7	47.5	43.7
Punjab	64.2	66.5	67.5	67.6	61.6
Sindh	38.6	38.5	39.5	42.3	38.5
KPK	294.4	294.5	290.1	282.6	291.1
Baluchistan	187.9	109.1	92.1	55.4	32.2

Source: Consultant's Computing based on Crop Reporting Services of Provinces, Government of Pakistan Banana yield Statistics

The corresponding yield data collected from the production cluster in district Matiary is reported in Table 10 below.

Table 10: Yield Data from Production Cluster District Matiary

	Yield (Monds per Acre)
Progressive Growers	600-800
Small Growers	350-400
Average	400-450

Source: Banana Growers

It is striking to note a 1: 10 ratio between the officially reported figures in comparison with the average yield figure from the growers.

	Yield (Monds per
Average Yield reported by FAO	38-40
Average Yield Reported by Growers	450-550

The consultant recognizes that the difference between the official yield figures and the ones obtained from the growers is too big and too obvious to ignore.

There are huge implications for value chain analysis and competitiveness assessment depending upon which figures are used.

If, yield data from the field is used and it is assumed that the area under cultivation figure from the various banana producing districts is reliable/correct, then the overall banana production figure should come out to be close to a million tons for the country in 2012. This is almost 10 times the officially reported figure.

The yield data obtained from the growers also make sense if compared with yield figures of other leading banana growers reported by FAO. For instance the yield figures reported by FAO Stats for Pakistan (4.75 tons per hectare for year 2012) are very low as compared to yield figures reported for India where conditions are similar (even cultivars/varieties are similar). In comparison with other leading banana producing countries the yield figures for Pakistan seem too low as well. For instance the yield figures for the top 10 producing countries range between 20-58 tons per hectare and the world average is over 20 tonnes per hectare.

As per the data collected from the field during the validation process, banana cost of production per acre varied between Rs 113,532 and Rs 135,232 per acre for small growers in 2013 and most of the banana farms were contracted out between Rs 150,000 to Rs 200,000. For large progressive growers, cost of banana production varied between Rs 126,532 and Rs 147,132 per acre and most of the farms were contracted out between Rs 250,000 to 350,000 per acre. Banana farm gate price varied between Rs. 600-1200 per 40 Kg.

At the officially reported yield figures cost per 40 kg should vary between Rs 2,597 per 40 Kg and Rs 2,885 per 40 Kg for the most progressive growers. This is several times the farm gate price or even retail price in Pakistan. If official yield figures are assumed correct, then Banana production is totally an unviable business proposition for growers.

It is concluded from the analysis above that the official production data may lead to misleading conclusions if value chain analysis is based on the same.

The consultant therefore constructed a scenario based on the yield data from the growers and analysis thereof as shown in Table 11 below.

Table 11: Pakistan Banana Production Scenario (2011-12)

	As per Official Statistics	As per Estimation based on Field Data
Area Under Cultivation	29,283	29,283
Yield (maunds per acre)	47.52	450
Pakistan Banana Production	139,145	1317735
Ranking Among World Banana Producing	20th	49th
Export as Percent of Estimated Production	30%	2.20%

Source: Consultant's Computing based on Crop Reporting Services of Provinces, Government of Pakistan Banana yield Statistics, FAO Stats and Field data

Cost of production analysis shows that producing banana is profitable for growers at the going market prices and the yields levels. It is also evident from the cost of production data presented in Annex B that medium and large growers are making higher profits per acre as compared to small growers. Feedback from growers, however indicate that profitability is eroding on account of higher input costs. Many believe that the trend would continue if the farm practices are not improved to enhance productivity and export markets are not diversified to achieve more stable and higher prices for the product.

If cost of production data is compared with official banana yield statistics, producing banana becomes a completely un-viable business proposition for the growers.

II. Market Trends

Domestic markets

Banana is by and large sold to consumers in a traditional way. Most of the local consumption is fed through road side fruit shops and vendors in villages, small towns and even big cities. Banana along with other fresh fruits is also sold in fruit sections of departmental stores and super markets in major urban centers. Pakistan imported Bananas in 2012.

Table 12: Pakistan Banana Imports, 2012

Exporters	Imported value 2012 (USD thousand)	Trade balance 2012 (USD thousand)	Share in Pakistan's imports (%)	Imported quantity 2012	Unit value (USD/unit)	Growth in value 2008-2012 (% p.a.)	Growth in quantity 2008-2012 (% p.a.)	Ranking of partner countries in world exports	Share of partner countries in world exports (%)	Total export growth in value of partner countries 2008-2012 (% p.a.)
World	1,297	11,456	100	5,676	229	319	560		100	2
India	606	606	47	3,225	188			28	0.3	14
Philippin	602	602	46	2,045	294			5	6.9	13
Sri	80	80	6	372	215			50	0.1	72

Source: ITC Trade Map, 2013

Source: ITC Trade Map, 2013

According to the traders, demand for the imported Bananas is increasing in the urban markets. Consumers are attracted to clean, large size, uniform color fruit and are ready to pay a premium for the properly packed Bananas as compared to the local product available in the market. The trend was confirmed by the purchasing staff at the organized super markets like Metro Stores and Hyper Star Store. The relative size of market for processed and packed Banana however is very small as compared to Banana sold the traditional way.

World Banana Exports

The Table 13 below shows share of world market by Top 10 banana exporting countries in 2012. Table also shows that international banana trade is dominated by top 10 leading exporting countries who command more than 80% of world market share.

Table 13: Share of world market by 10 leading exporting countries in 2012

Rank	Exporters	Value exported in 2012 (USD thousand)	Quantity exported in 2012	Unit value (USD/unit)	Annual growth in value 2008-2012 (%)	Share in world exports (%)
	World	9,328,956	19,644,135	475	2	100
1	Ecuador	2,047,520	5,093,615	402	6	21.9
2	Belgium	1,284,123	1,261,038	1018	-4	13.8
3	Colombia	822,010	1,834,936	448	4	8.8
4	Costa Rica	788,324	2,054,426	384	7	8.5
5	Philippines	647,880	2,648,369	245	13	6.9
6	Guatemala	618,314	2,033,236	304	13	6.6
7	United States of America	436,456	530,889	822	6	4.7
8	Honduras	342,148	901,361	380	16	3.7
9	Germany	275,411	272,608	1010	-13	3
10	Cameroon	260,462	306,096	851	-7	2.8

Growth Trends

Mozambique, Nicaragua, Lebanon, Thailand, Spain, Greece, Bolivia, Peru, Honduras, India, Philippines, Guatemala, Mexico recorded double digit annual growth between 2008 and 2012. Among the top ten exporting countries, Costa Rica, Ecuador, United States of America and Colombia recorded higher than world annual growth during the same period. Pakistan's exports increased 30% annually between 2008 and 2012.

European countries like Belgium, Sweden, Russian Federation, Germany, Portugal, Hungary, Italy and United Kingdom recorded declining trade (re-exports) during the period. The trend signifies increasing direct trade between producing countries and consuming countries at the expense of trade through re-exporting countries.

Unit Price Trends

World average Unit price for banana trade was USD 475 per ton in 2012. It is worth noting from the list in Table 9 below that, European countries like Spain, Belgium, Germany, Netherlands and Italy traded at much higher (more than double world average) unit prices. Exporters like Cameroon, Côte d'Ivoire Peru and Panama also recorded much higher unit prices than the world average.

It is worth noting that top rank exporting countries Ecuador (1st), Costa Rica (4th), Honduras (8th), Guatemala (6th) and Philippines (5th) exported at average unit prices below world average unit price.

India exported at USD 438 per ton realizing 92% of world average unit value whereas Pakistan exported at USD 430 per ton realizing 91% of world average unit value. Philippines exported at an average unit price of USD 245 per ton which was only 52% of world average.

Table 14: Unit Export Prices of Top Exporting Countries in 2012

Rank among Exporting Countries	Exporters	Unit Value (USD/unit)	Unit Price as Percent of World Average
15	Spain	1214	256%
2	Belgium	1018	214%
9	Germany	1010	213%
14	Netherlands	932	196%
20	Italy	905	191%
10	Cameroon	851	179%
12	Panama	846	178%
7	United States of America	822	173%
11	Côte d'Ivoire	781	164%
13	France	751	158%
16	Peru	690	145%
17	Suriname	679	143%
37	Thailand	485	102%
19	Dominican Republic	471	99%
3	Colombia	448	94%
28	India	438	92%
38	Pakistan	430	91%
1	Ecuador	402	85%
4	Costa Rica	384	81%
8	Honduras	380	80%
6	Guatemala	304	64%
5	Philippines	245	52%
World Average Unit Export Price in 2012			475

Source: ITC Trade Map, 2013

Pakistan Banana Exports

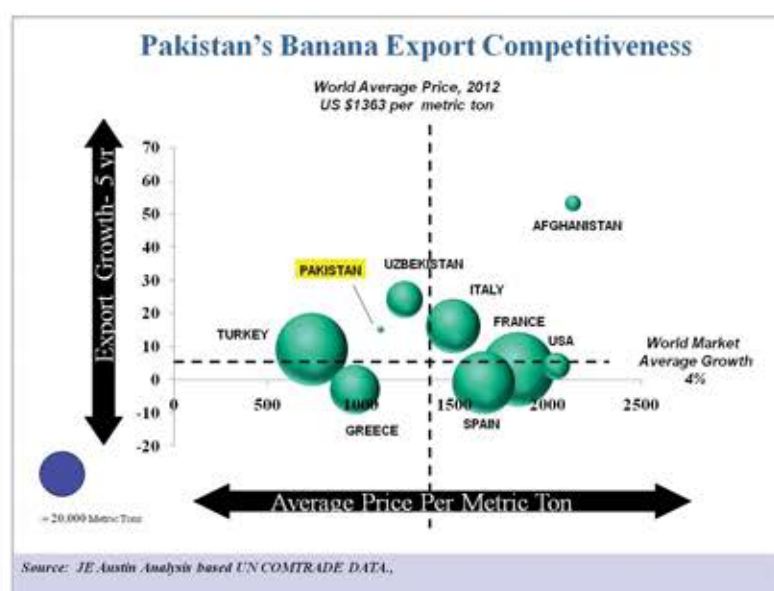
As evident from Table 15 below, almost entire Pakistani banana exports were to Afghanistan in 2012. Pakistan exported more than 29 thousand tons of bananas worth 12.7 million dollars in 2012 at an average unit price of USD 430 per ton. In value terms, Pakistan Exports has grown by 30% annually between 2008 and 12 whereas the world market has grown by 2 % annually in the same period. This means Pakistan is gaining its competitive position in an otherwise growing market. In terms of exported quantities, Pakistan recorded 10% annual decrease in the corresponding period. Pakistan average unit price of USD 430 was 91% of the world average per unit price for the year.

Table 15: Pakistan Banana Exports in 2012

Importers	Exported value 2012 (USD thousand)	Trade balance 2012 (USD thousand)	Share in Pakistan's exports (%)	Exported quantity 2012	Unit value (USD/unit)	Growth in value 2008-2012 (% p.a.)	Ranking of partner countries in world imports	Share of partner countries in world imports (%)	Total import growth in value of partner countries 2008-2012 (% p.a.)
World	12,753	11,456	100	29,685	430	30		100	3
Afghanistan	12,753	12,752	100	29,685	430	31	59	0.1	32

Source: ITC Trade Map, 2013

Chart 8: Pakistan Banana Export Competitiveness:



As Table 10 above shows Pakistan with 31% annual growth rate between 2008 and 2012, was one of faster growing banana exporting countries in the last five years. Due to faster average 2% than that growth of the world, Pakistan's share of world market has increased 0.4% in 2012. This strong export growth has also strengthened Pakistan's Revealed Comparative Advantage (RCA) Index, which increased to 1.0 over the same period. The RCA index focuses on the concept of comparative advantage, accounting for the relative efficiency of producing different goods in the home country compared with the rest of the world. The RCA denotes relative efficiency indirectly, based on trading patterns that emerge from actual market transactions. It may not be equated with a competitive advantage- which requires many other elements to be in place— including appropriate marketing links and input supply channels, financing mechanisms, uniform product quality, and many other demand requirements. In other words, comparative advantages can be built into competitive advantages. An RCA greater than 1.0 indicates a comparative advantage for that item, while an RCA lower than 1.0 identifies a comparative disadvantage.

Table 16: Pakistan Banana Exports: Revealed Comparative Advantage (RCA):

2012	
Pak Banana Exports Volume (Tons)	29,685
Pak Banana Exports Value (000 \$)	12,753
Pak Banana Exports Unit Value (USD per/ton)	430
World Banana Exports	9,328,956
Pakistan Exports All Products	24,613,676
World Exports (All Economies)	17,981,277,146
Pakistan Banana Exports RCA	1.00
Pakistan Banana Exports Share of Market (%)	0.14%

However, Pakistan realized an average unit price of USD 430 per metric tons in the year 2012, which in relative terms represents only 91% of the world average per unit price.

While a useful tool, RCAs are imperfect because they also embody government policies and institutions that may be distorting markets and like many indicators, it accounts only past performance. As long as these imperfections and limitations are recognized, RCAs can be helpful as analysis tools, since data are generally available in the trade record to gauge comparative advantage.

World Imports:

World Banana imports valued over USD 12.7 billion in 2012. Market has grown at 3% per annum between 2008 and 2012 in value.

United States was the largest importing country in the world in 2012 with imports worth over USD 2.4 billion and 4.64 million tons of bananas imported. Belgium, Germany and Russian Federation follow the list with USD 1,429, 924 and 921 thousand worth of Banana imports. Ten leading import markets accounted for 71.4 % of total world market in 2012.

Beyond being among the largest import markets, United States, Russian Federation and China were attractive markets for a double digit annual growth in the last five years.

Table 17: World's Top 10 Banana Import Markets, 2012

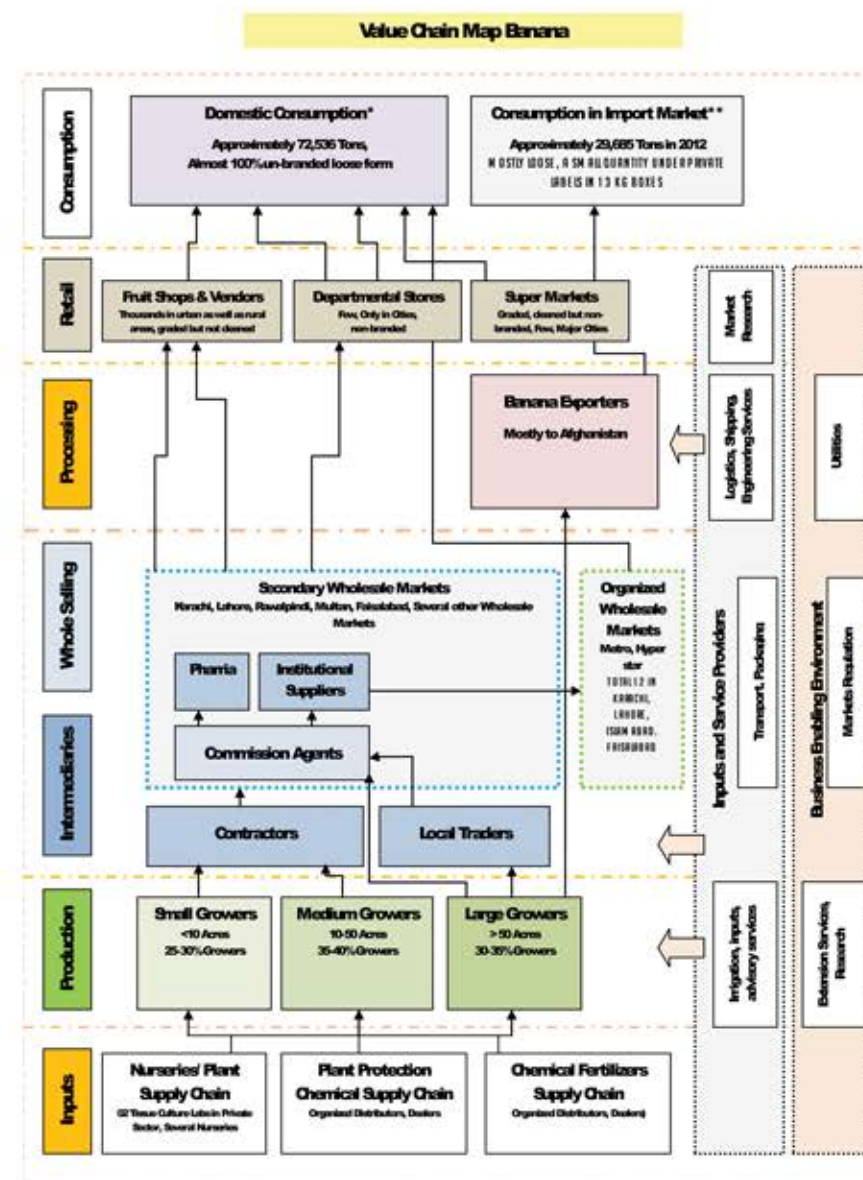
Ranks	Importers	Value imported in 2012 (USD thousand)	Quantity imported in 2012	Unit value (USD/unit)	Annual growth in value (%)	Share in world imports (%)
World		12,779,608			3	100
1	United States of	2,434,814	4,644,770	524	10	19.1
2	Belgium	1,429,261	1,326,839	1077	-6	11.2
3	Germany	923,920	1,163,756	794	-4	7.2
4	Russian Federation	921,326	1,255,608	734	11	7.2
5	Japan	886,204	1,086,738	815	0	6.9
6	United Kingdom	810,106	1,062,614	762	3	6.3
7	Italy	484,812	637,259	761	-3	3.8
8	France	466,786	577,702	808	-1	3.7
9	Canada	391,513	527,040	743	6	3.1
10	China	365,729	581,573	628	32	2.9

Source: ITC Trade Map, 2013

Table 17 also shows that European markets imports were on much higher prices than the prevailing prices for Pakistani Bananas. The industry is of the view that the higher prices is primarily due to size, uniformity of color and spot less skin. Banana exports however believe that Pakistani Bananas do have market in several Middle Eastern countries due to distinctive sweet taste.

III. Structure of the Banana Value Chains:

Banana value chains comprise of the following participants and actors; Inputs Suppliers, Growers, Contractors, Commission Agents, Resellers, Traders/Institutional Suppliers, Exporters, Importers and Retailers. A map below depicts the flow of goods across the chain:



*The domestic consumption figure is estimated on the basis of official statistics. Industry believes that actual consumption is much higher since the local production is under reported

**Consumption of banana of Pakistan origin is based on the ITC Trade map data. IT is however believed that the actual figure is several times of the recorded figure since informal trade across Iran and Afghanistan borders is not recorded.

Input Providers

An elaborate presence of input providers exists in the Banana producing areas. Every town has dealers of fertilizers. In addition to authorized dealers for fertilizers and pesticides who sell as per the policies of their principals, there are many who buy in whole sale quantities and retail in small quantities. These dealers also sell on credit to small growers who usually are short on finances. These input dealers serve as a source of informal credit to small growers. In addition to dealers' network, inputs are also provided by commission agents in the whole sale markets. The mode of payment is also usually credit and commission agents usually charge marked up prices for the inputs they provide.

Due to proliferation of plant protection chemical brands/labels, growers find it difficult to differentiate between quality products and sub standard ones. Availability of standard products is an issue, as reported by many growers.

Similarly there are many stories of cheating growers by selling counterfeit products by fertilizer as well as pesticide dealers.

There are serious implications of sub-standards and counterfeit fertilizers and plant protection chemicals for Banana growers as well. Many experts believe that incidence of disease has increased due to ineffectiveness of these chemicals. They also claim that some of the pathogens have mutated due to inappropriate application of broad spectrum pesticides and therefore several insect pests have developed resistance against plant protection chemicals available in the market.

In order to ensure that adulteration does not take place at the retail level and that counterfeit products are not sold under their establish brands, many leading input marketing companies' have established their own networks of franchised outlets. The franchise outlets are gaining popularity with growers who buy on cash and who had un-satisfactory experience with the non-branded or conventional input dealers in the past.

On the other hand, private dealers have mushroomed in the Banana producing areas and a proliferation is observed over the last few years. This is attributed to heavy profits available to the dealers by selling products of un-known brands or labels or counterfeit products of popular brands. Whereas leading brands of fertilizers and other inputs are trying to create awareness among growers and also trying to increase availability of standard products through their franchise networks, the problems due to sale of substandard inputs is on the rise. Growers complain that they incur heavy losses due to substandard products. They also complain that at times government extension staff collude with sellers of substandard products and try to influence purchase decisions in favor of substandard products in exchange for gains offered by these companies.

During the focus group discussion with small growers at Bhit Shah, growers pointed out that at times department of agriculture staff were also responsible for the situation. He questioned the wisdom of the provincial government to approve hundreds of labels at the first place. They also expressed deep concern over the capacity of the government to ensure that the licensed producers were packing as per the standards and counterfeits were not selling in the market place.

Structure of Banana Production:

Banana Orchard is the production house where fruit is produced. There are two major stakeholders involved at the farm level, the farmer/owner and the contractor. Typically, the owner of the farm manages all the farming activities at the farm but does not involve in the marketing of his fruit in the market. Since harvesting and marketing are capital intensive operations involving market risk, the farmer minimizes this risk and leases off his farm to a marketing contractor at a wholesale price prior to the start of the harvesting season. However progressive farmers, having capital investment, tend to harvest and market the farm produce by themselves.

The contractor (pre-harvest contractor) is responsible for the harvesting, post harvest operations, logistics and marketing of fruit in various fruit markets across the country. A typical marketing contract would have a lump sum fruit value to be paid in one to three installments to the owner. Usually one installment is paid in advance at the time of the contract while the rest are to be settled during the harvesting of the fruit. Estimated yield of the fruit, anticipated future price of the fruit and the estimated harvesting cost are the main drivers of the wholesale contract value. Depending on the risk averseness and the cash requirement of the owner, the marketing contracts are sometimes done years in advance whereby all the farming and harvesting operations are to be carried out by the contractor as well. A higher upfront advance payment normally results in a lower overall lease value of farm.

The contractor either invests his own equity in the lease contract or borrows this amount from the broker of the fruit market. Some of the harvest contractors are the leasing agents of the fruit brokers who lease the fruit farms on behalf of the brokers (Aarhtis) without investing their own equity. They supervise the entire harvesting and marketing activities managed through contract labor and earn a commission on the profitable sale of the farm. In such cases, since the capital is invested by the broker, a contractor is bound to sell his fruit to his brokerage house (trading shop in the Mandi) at his terms; including commission rate. The same is true for the farmer who sells his produce to the brokers from whom he has borrowed any loans to support his farming activities. Thus, at the farm level, the stakeholder who has investment capacity tends to benefit the most from the activity.

Structure of Marketing Channels:

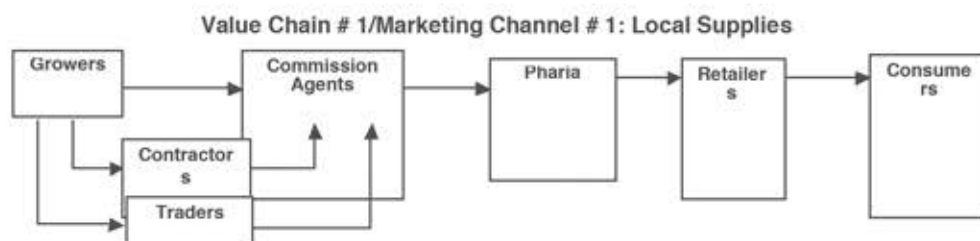
As about 90% Banana is grown in Sindh. Farmers, contractors, commission agents, traders, exporters and retailers are the main players of the market. Farmers and contractors sell the produce to traders or commission agents. The traders target the following market segments:

- Secondary or terminal markets of other towns of Pakistan
- Local retailers
- Afghan Traders
- Exporters

Secondary or Terminal markets:

Karachi, Lahore, Islamabad and Peshawar are the most prominent among the secondary or terminal markets for banana trade in Pakistan.

Banana produced in Sindh reaches through three distribution channels to the consumers. It reaches the domestic consumers through commission agents and middle men.



Analysis of the value chain reveals that the average purchase price of Banana ranges from Rs 12.5-22/Kg. The cost of harvesting banana bunches is Rs 1/Kg and is absorbed by the contractor. The fruit is then sent to Karachi or other wholesale markets for local sales.

An estimated 7-10% of the fruit is damaged during the transport to the whole sale market, which is lost afterwards/once ripened. Six to eight (6-8%) fruit is lost till it reaches a retail shop. The loss is usually absorbed by reseller or a retailer. The maximum loss takes place at the retail shops if retailer is not able to sell within a day or two, due to short shelf life of the ripened product. The damage which takes place during the transportation stages becomes evident at this stage.

Value Chain # 2/Marketing Channel # 2: Exports

The 2nd channel runs for the export. The fruit is purchased by the exporters. It undergoes cleaning, grading and packing and then it is stored in the storage for ripening before it is transported for the export destination.

There are two chains operative for exports. One comprises of Growers, Exporters, Importers and Consumers in the end market. By far this is the shortest of all chains and most efficient for its participants. Leading growers have started following this channel as far as they get an opportunity, for its obvious benefits of higher profitability. Exporters also prefer this mode for control over quality of product.

The other chain operative for exports comprises of Growers, Contractors, Commission Agents, Commercial Exporters and Importers/Distributors. Usually commercial exporters purchase from the wholesale market instead of growers.



IV. CONSTRAINTS AFFECTING VALUE CHAIN COMPETITIVENESS:

Banana Value Chain is facing several constraints at the moment. Key constraints are list below:

a) Increasing Cost of Inputs:

A substantial increase in global fertilizer prices has been reported (CABI Survey 2008). For example, average international market price (FOB) of urea increased from mere US\$ 79.3 per metric ton in 1999-2000 to US\$ 255.8 per metric ton in 2006-07. During the corresponding period, average market price of DAP rose from US\$ 153.5 per metric ton to US\$ 320.8 per metric ton.

In the domestic market, the prices also rose following the same trends. For example, price of urea increased from Rs. 324 per bag of 50 kg in 1999-2000 to Rs. 1800 in 2012-13. Similarly, price of DAP surged from Rs. 632 per bag to Rs. 3500 during the afore-said period.

Similarly a sharp increase in the prices of other inputs has been experienced by Banana growers in Pakistan. There has been a 60% increase in cost of utilities over the last five years and similarly cost of fuel has witnessed over 100% increase in the last five years. These inputs are essential for Banana growers as they have to pump irrigation water using either electricity operated water tube wells or diesel operated engines (called peter engines) to energize pumps.

According to growers, high cost of utilities and inputs has squeezed their profitability in the recent years as they are not getting corresponding increase in price of their produce.

b) High Incidence of Diseases and Pests:

There are several pests and diseases which are common threats to the Banana farming in Pakistan. Particularly fungal diseases have been harmful in the past. Bungi Top Virus has been catastrophic in the past and poses a major threat.

c) Quality of Harvesting Labor's Skills:

Due to poor skills of the contract labor or careless handling, skin is damaged during the harvesting and transportation processes. This fruit otherwise may be fit for export and may get full economic value instead of selling at discounted rates.

d) High losses during the post-harvest handling:

During the validation process, the consultant learned that whereas the overall wastage has decreased, the overall loss of value is still substantial (8-12%) in many cases due to in appropriate transportation of fruit from orchard to the place of marketing. Due to skin damage, the same cannot be included in either export category or prime quality for the local markets. Although none of the value chain actors has calculated the extent of the losses, they feel their profitability is definitely hurt.

e) Inadequate Cool Chain Facilities:

Inadequate cold storage facilities in the Banana producing areas are reported as a constraint by leading growers. Due to lack of purpose built cold storages for banana fruit (where temperature, relative humidity and concentration of gases can be maintained at an optimal level for banana fruit, fruit cannot be stored for longer period of time. This results in fruit wastage on one hand and sharp increase in prices beyond the usual harvesting season.

f) Poor Transportation Facilities:

General purpose open body trucks are filled with banana bunches stacked one on the other for transporting bananas. The dead weight due to stacking banana bunches damage fruit and skin gets damaged due to poor road conditions. Absence of purpose built transport facilities is a constraint affecting fruit quality.

g) Relationships among the Value Chain Actors:

The existing relationships among the value chain actors may be characterized as “weak cooperation”. Flow of information and sharing of experience is generally weak and superficial. One of the reasons that good practices do not propagate despite the fact that more progressive and resourceful has access to such information. The role of existing growers association is insignificant. Similarly the exporters’ association is generally controlled by few top exporters of fresh fruits and vegetables. The association is managed by a club with limited access to information to members outside the club.

Limited flow of information and resulting coordination between producers, processors and exporters may be attributed to cultural reasons and some historical reasons as well, yet it is imperative for the competitiveness of the value chain.

The distribution of profit among the Banana value chain actors is reflective of a dominating role or power with the middlemen. As the price cost calculations indicate, middlemen’s real returns on investment are very high as compared to the stated ones. Due to strong bargaining position and due to asymmetry of information they are able to generally manipulate the supply-demand situation to their advantage whereas growers and consumers are on the receiving side on both the ends. As the price cost ladder for supplies system to domestic consumers indicates, growers only get between 15-18% of price paid by the consumers at any point in time and for any quality or grade of fruit. The price cost ladder also indicates that bulk of the profit is retained by the Contractor-Aarthi-Pharia part of the value chain. The main role is though played by the Aarthi or the commission agent who on one hand controls the farm gate prices through the contractors/local traders and (the price paid through contract) hikes the price through its agents or Pharias once the produce has been bought through an auction system from growers.

Whereas the operating profit of Phari walas and retailers generally does not fluctuate much as percent of prevailing prices, the profit margin of contractor and commission agents vary considerably and significantly depending upon prevailing prices at any point in time. Since a minimum profit for the commission agents is secured as they charge a percent of transaction (top line) as part of services they render (auction) it is in their interest to increase their hidden profit by manipulating prevailing supply demand situation to their advantage. Though mechanics and dynamics vary from case to case basis and from time to time, they have an overriding control/influence over the others in the chain.

Unlike marketing systems in developed countries, the terms of transaction as well as parameters of trade are different on either side of a commission agent. While buying from the growers, the transaction is done through an auction system whereby the traction is apparently facilitated by the

commission agent’s representative. The title is not transferred to commission agent as such and apparently the commission agents do not have any vested interest in the transaction. In actuality however, the commission agent works hands in glove with bidders to determine/dictate prices. In the 2nd phase, the commission agents manipulate the situation in their favor with the help of phari walas. There is a huge disconnect between the two parts of the transaction. The lack of information as well as lack of bargaining power on part of growers in the 1st part of the transaction as compared to the commission agent/buyers puts growers to an extremely disadvantageous position. Growers are mostly price takers in the relationship. On the other hand the “buyers” in the 2nd part of the transaction are at an extreme disadvantage as compared to the seller “Phari Walla” or the “Pharia” for the reasons (1) a symmetry of information (2) bargaining power in the relationship due to scale and elasticity arising out of that and (3) financial power of the Pharia due to credit involved (financed by the commission agent usually).

The prevailing situation in Banana value chains is also reflective of dynamics described above. Although some growers are selling to exporters directly, the bulk of the business is done through the mandi system (over 90%) and therefore result in two strong manifestations (a) high spread of prices between the farm gate prices and the prices available to consumer and (b) very high price fluctuations between transaction to transaction, between season to season. The implications arising out of the 1st manifestation result in poor profitability for the growers and high prices for the consumers and the implications of the high variability/fluctuation create very high level of uncertainty for the other value chain participants, growers being unsure of their profitability and high perceived risk usually resort to low input-low output model. A strong de-motivation prevails with them generally as they experience huge losses when they produce more (so called oversupply situations in the mandi). Due to sudden and high magnitude fluctuations in prices arising out of manipulation of the so called supply-demand situations in the mandi, growers get mixed signals. They experience and also learn through “word of mouth” from other growers that price of produce is not determined on “quality” of produce. They also experience that the market place does not differentiate between various grades and qualities and therefore the price differentials offered do not provide sufficient premium for high quality produce.

The consultant believes that the prevailing mandi system is responsible for many distortions and also responsible for lack of incentives for growers to increase productivity well as quality of produce. This is regarded as a root cause impeding the Banana value chain competitiveness.

h) Value Chain Support Organizations

Organizations like Pakistan Horticulture Development Export Company (PHDEC), Small and Medium Enterprise Development Authority (SMEDA), Trade Development Authority of Pakistan (TDAP), Sindh Board of Investment, National Agriculture Research Council, Pakistan Agriculture Research Council, Research Institutes, Agri-Extension Department, Agribusiness Support Fund and donor agencies working for development of Horticulture sectors are supposed to provide support to banana value chain stakeholders.

It was a unanimous view in the validation workshop attended by representatives of various value chain stakeholders that there was an apparent lack of effectiveness of efforts and money spend in this regards, which was attributed to:

- Lack of coordination among the support institutions and donor funded projects, resulting in duplication of efforts in many cases and lack of efforts in other equally essential to alleviate gaps/weaknesses in the chain;
- Quality of technical inputs,
- Effective management of projects/interventions;
- Lack of continuity,
- Lack of Joint ownership by value chain actors/stakeholders

V. CONCLUSIONS, RECOMMENDATIONS & PROPOSED INTERVENTIONS

Conclusions:

Key findings and conclusions drawn on the basis of the analysis and assessments presented in the various sections above are summarized below.

- Pakistani Banana though has high Brix (sweetness level), yet is of smaller size in comparison with bananas from the competing exporting countries. It is generally regarded as a low quality inconsistent product after ripening because of skin bruises and spots. Pakistan is currently only exporting to Afghanistan, exports to regional market has reduced to almost zero, due to competition from regional exporters like India and Philippines. Banana exporters have not been able to have inroads into regional markets that have been penetrated by producers like India, China and Philippines due to want of an export quality product
- The banana domestic market is fed through a traditional supply chain comprising of wholesalers, traders and wet market retailers. Product is usually not differentiated on quality or branding and market experiences extreme fluctuations in price due to “over supply” during the harvest season and “short supply” during the off-seasons. The availability is limited during the off-seasons due to absence of “storage” capacity in the chain. Banana value added or processed products are non-existent at the moment. A small niche market has developed for imported banana from India and Philippines recently. The demand for bigger in size, spotless, properly packed banana is limited to high end market segment at the super markets due to 300% to 400% price as compared to the local banana. This due trend is however considered encouraging by progressive growers who believe that they can offer a comparable product to up-end and mid segments of the market by adopting to improved production, harvesting, supply chain management and selling practices for local markets.
- The agro-ecological conditions in most of the existing and adjoining areas in Sindh and Coastal regions of Sindh and Balochistan provinces are considered conducive for production. Natural resource base is indicative of a strong comparative advantage for banana production in Pakistan.
- Pakistan current export base is solely dependent on Afghanistan. While the world market trends indicate expansion of demand, Pakistan banana exports practically reduced to zero in all markets except Afghanistan.

- Banana value chain competitive position is weak due to several supply side constraints and gaps; (1) low yields due to limited genetic potential of banana varieties and poor farm management practices, (2) under developed supply chain contributing to product losses, low quality inconsistent product with skin bruises and (3) weak direct linkages among growers and exporters result in uncertainty, high price fluctuations and low trust levels in the chain. Low profits for growers is further affecting production and quality as they generally believe that market does not offer sufficient reward for quality product.

- Several weaknesses at enterprise level are also reflective of poor cooperation among the value chain players and a less than supportive business environment. Limited sharing of information among stakeholders on matters of collective interest, poor advocacy with the government regulatory agencies and policy making institutions are reflective of weak cooperation among value chain actors.

- Factors like lack of coherent strategy to curtail incidence of diseases like Bungi Top Virus, failure to develop high yielding banana varieties resistant to prevailing diseases, are clear reflections upon the in-effective performance of various value chain support organizations. Similarly weak understanding of exporters' on market access requirements, buyer requirements, management systems, importance of certification is also reflective of less than effective role of support agencies mandated and funded to support banana value chain. From the assessment of the prevailing situation, it is also concluded that poor technical skills of labor as well as staff working on farms and with exporters generally are reflective of services provided by training service provides funded by government and donors. Poor knowledge on the part of growers to adopt good agriculture practices and awareness on product quality standards is reflective of extension services rendered by public sector extension services department.

- It is therefore concluded that efforts are urgently required by individual value chain actors to work upon their respective weaknesses. More so there is an urgent need to improve level of cooperation among the Banana value chain actors. Value chain support institutions need to enhance their effectiveness to provide support in areas which individual actors cannot manage at their level, as elaborated in the preceding sections of this report. Last but not the least, value chain stakeholders need to work with the government regulatory agencies through effective representation and one voice to highlight irritants they are facing in the business environment and work towards alleviating the same.

- It is concluded that desired value chain improvement measures though any supply side support interventions may only be sustainable if are based on market demand based systems. It is also concluded that the existing market system does not offer sufficient incentive to growers to work for improving product quality. A disconnect in the chain exists, as growers think that premium offered on better quality is not enough to reward extra efforts and compensate for additional costs incurred by them. On the other hand exporters are reluctant to purchase directly from the growers as they believe that purchasing directly increases their risks and transaction costs and make them uncompetitive on price.

- It is concluded that lack of direct business contact between growers and processors/exporters and dominant role of intermediaries is responsible for the present situation where a significant flow of resources is moving out of the chain. Since the profitability of the intermediaries like the commission agents and/or the brokers do not depend as such upon the product quality as compared to the prevailing supply-demand situation (sharp seasonal fluctuations) they do not usually offer sufficient incentives for quality.

- Whereas technically there are several solutions available and some of the growers have already started adopting the same with the help of agriculture extension staff of processors, the root cause of slow/lack of adoption is absence of any market incentive for improved product. It is therefore, concluded that promoting a quality based purchasing system is key to the success and sustainability of any such efforts to improve practices in the producing clusters. It is imperative to create a pull for better quality product that provides sufficient economic incentive to the growers to adopt improved drying practices

- It is also recommended that the anomaly highlighted in this report is reported to the concerned government of Pakistan Departments; Statistics Division at the federal level and Crop Reporting Services of Provinces (Especially Sindh Province) at the province level so that the obvious anomalies or errors may be rectified. The data anomalies should also be shared with FAO Stats so that the UN Agency may also take appropriate corrective measures.

Recommendations:

From the conclusion drawn in the preceding section and in order to address supply side constraints for enhancing banana value chain competitive position, three pronged value chain development strategy is proposed. Some of the salient are listed below for the consideration of ASF management:

- It is recommended that project works with leading banana exporters and progressive traders to facilitate a "premium for quality" based purchasing from the growers to help creating a pull for "improved" quality banana. As the market leading buyers are already convinced and are willing to pay premium for "bigger size, consistent color banana without skin bruises" project should direct its support to enable "sufficient" premium.

- One way to support growers is to help them improve their production and post harvest related processes. This should be linked with a buy back arrangement which promises sufficient premium for those who produce as per agreed quality parameters with the buyers.

- In order to have a market demand based system, it is recommended that such an initiative is undertaken with the active support and participation of leading banana exporters so that to create a pull factor for "an internationally acceptable product" they require for boosting their exports. Specifically it is recommended that project consider supporting:

- Programs targeted to value chain actors to enhance their capabilities in managing their businesses more efficiently. Since most of the major capacity gaps are related to banana production; low yields and low quality of produce, special focus to capacity building efforts for growers is recommended. Orientation programmes for growers to enhance their awareness level with respect to market requirements and orchard management programs covering technical trainings on GAPs, product handling, market requirements, and product quality standards as required by the markets are recommended. On similar lines coordinated and well designed capacity building programs are recommended for exporters to help them overcome their capacity related issues as discussed in the report.

- Assistance to overcome technical challenges, for instance technical assistance for developing improved banana varieties, code of orchard management practices to improve effectiveness of extension message. Supporting market studies to ascertain import potential of target

markets and understand buyer requirements and consumer preferences in these markets, besides understanding compliance related aspects is also recommended.

- Market diversification efforts are strongly recommended for a broader export base. GCC countries particularly are recommended for such efforts. Markets including several regional countries may have appreciation for "sweet" banana offered by Pakistan as compared to more expensive products from elsewhere. China is recommended for a special focus since it is a high volume and high growth market. Coordinated efforts to establish new market linkages are recommended for these markets.

- Product development, especially development of varieties well accepted in the high end segments of developed markets are recommended for the long term competitiveness of Pakistani banana Value chains.

Proposed Interventions:

Keeping in view the gaps and weaknesses constraining performance or competitiveness of banana value chain on one hand and project objectives and remaining project life, following value chain support interventions are proposed for the consideration of TAP/ASF management.

a) Support Banana growers to implement an integrated farm improvement initiative. Such a system should provide necessary knowledge/advice and services to willing growers for implementing good agricultural practices in their orchards so that product quality and yields can be improved. Such extension model should help demonstrate that orchard incomes can be increased by implementing good agriculture practices. The business model for the extension services should be based on cost recovery from the recipients of the services to enable sustainability of services beyond the life of the initiative. Incidentally, some banana exporters and progressive growers from Tando Allayar have expressed their willingness to sponsor such an initiative if some support is available for initial setup. The size of such a program may be planned keeping in view project remaining life but should be sufficient to create an impact and a strong demonstration effect in the cluster. Orchards covering around two thousand acres may a good starting point.

b) Support setting up pack houses at farms to improve product handling and save product from multiple handlings at various locations/stages. Two different models are proposed for on-farm infrastructure (1) small pack house (merely a shed with necessary facilities) for small growers and (2) relatively larger pack house equipped with proper washing, grading, packing, cooling and ripening facilities to enable shipment as per international requirements.

a. The first model may be dovetailed with the FEG program component and FEGs already trained may be eligible for such on-farm infrastructure improvement program.

b. The second model should be designed for large growers. It is suggested that most progressive and receptive to change value chain actors are selected and supported through an integrated program. The farm improvement program, on-farm infrastructure improvement program and capacity building initiatives proposed must be dovetailed to an integrated support package. It is also strongly recommended to tie package with financial contributions from the partners and also linked with performance parameters agreed in line with TAP banana value chain competitiveness objectives.

c. On farm infrastructure improvement package may also include “protective bags” for banana bunch protection on tree and necessary tools for harvesting and transfer of banana bunches to packing area and loading area.

c) Support greater cooperation among the value chain actors by helping the stakeholders put in place an effective coordination mechanism through a common platform with the representation of all the value chain actors and stakeholders. The proposed mechanism should promote frequent interaction among the value chain participants to make them realize importance of collaboration among themselves. The facilitation mechanism should enhance level of trust among banana value chain participants and should pave a way for better cooperation among them for mutual benefits. Such a platform should work to bring value chain actors to common goals and help devise an agreed strategy for enhancing value chain competitiveness through mutual cooperation. The value chain working group or the platform should serve to perform functions of a dedicated banana value chain development entity. TAP should draw upon some good practices available locally and internationally. Role of some Sector Management Companies (SMCs) may be further studied to carve out an effective strategy implementation mechanism. The working group or platform may however enable that support interventions are sustained beyond the life of project. Since the TAP work plan already includes concept of a value chain platform, appropriate measures may be taken to put the concept into reality. In order to enable desired outcomes and impact as per TAP objectives and donor goals, a critical factor to ensure success is a strong ownership of value chain actors and their active participation during the designing, as well as implementation phases.

d) Support new investment by the private sector for establishing commercial cold storage facilities in the banana producing clusters. There is stated need to have modern cold storages in the area which could store bananas along with other fruits available in the area. Supporting a private sector initiative can serve demonstration of technology and business model for encouraging other investors. The consultant is suggesting further research to evaluate the benefits to cost ratio and economic and financial feasibility of such investment for the project.

e) Support new investment by the private sector for establishing several commercial scale banana tissue culture labs is recommended. To conduct a detailed technical and financial feasibility study for such an investment is recommended as the first step. The proposed feasibility study report should precisely identify and document the available opportunity along with a detailed risk analysis. The detailed techno-commercial feasibility should guide a prospective investor for establishing commercial scale Tissue Culture facilities with private sector investment and possible support by the project cost sharing basis.

a. Organize seminars to market investment opportunities to potential investors, and

b. Financial assistance in the following areas:

- i. For the purchase of Plant and machinery;
- ii. Procurement of technical services for designing, planning, construction, commissioning and trial production phases,
- iii. Achieving necessary Certification for the enterprise required by international buyers (Quality Systems, Environment Compliances, Social Compliances, Food Safety, Product traceability, Fair Trade and others)
- iv. Product development as per international market needs.
- v. Market linkages related activities like participation in international trade fairs and exhibitions,

f) Support Commercial Enterprises for processing and marketing bananas chips and other banana value added processed products.

In addition to the prioritized interventions above, TAP may also consider supporting initiatives identified in this report through the proposed banana working group. The consultant recognize that in order to enhance banana value chain competitive position in the long run, value chain constraints discussed earlier may need several other interventions to either improve upon existing level of services or “removing” irritants that inhibit performance of value chain participants.

- For instance government of Sindh attention/support is required to facilitate a more conducive wholesale market system in place.
- Effective support of public research is required to develop improved banana varieties.
- Active support of public and private sector universities is needed to create knowledge and code of practices for banana production.
- Government of Sindh, department of agriculture intervention is required to enable effective extension services to banana growers.
- TDAP to draw upon substantial resources the agency has for promoting international trade and facilitating establishment of market linkages.

Annex A: List of Sources, List of Interviews and List of Validation Workshop Attendees Studies and Literature Reviewed/Knowledge Sources Consulted:

1	The Fruit and Vegetables Global Value Chain, Karina Fernandez-Stark, Penny Bamber, Gary Gereffi, November 2011
2	The Agribusiness Project, Rapid Market Assessment Banana Value Chain,
3	The Agribusiness Project, Rapid Market Assessment Banana Value Chain, Sukkar
4	Final Report Horticulture Value Chain Assessment (Rupert Knowles) 31 Jan 2013
5	Pakistan Agriculture Value Chain Assessment, Fincon Services, Inc. 2011

Sources Consulted:

CODEX alimentarius-CAC : <https://www.codexalimentarius.net>
Pakistan standards & quality control authority (PSQCA) <https://www.psqca.com.pk>
Food and Agricultural organization – FAO: <https://www.fao.org>
International Trade Centre – Market Access Map-UNCTAD/WTO: <https://www.intracen.org>
International plant protection convention – IPPC : <https://www.ippc.int>
The world health organization WHO : <https://www.who.int>
United Nations Industrial Development Organization (UNIDO): <https://www.unido.org>
International organization for standardization (ISO): <https://www.iso.org>
The United Nations development program (UNDP): <https://www.undp.org>
United States department of agriculture (USDA): <https://www.usda.gov>
The United Nations conference on trade and development (UNCTAD): <https://www.unctad.org>

List of People Interviewed:

Sr.	Name	Designation/Organization
1	Raheel N. Shah	Progressive Banana Grower
2	Hadi Leghari	Technical manager Asim Farms, Tando Allyar
3	Ameer Hamza	Farmer
4	Syed Ibrahim Ali	Grower
5	Shakeel Ahad	Grower and Transporter
6	Shahjahan Hashmani	Project Manager SAFWCO
7	Aslam Pakhali	F.A International Proprietor
8	Shankar Lal Talib	Assistant Director Agri Ext
9	Ghulam Ali Shah Pasha	Qalandar Shahbaz Agro Farm
10	Mukhtiar Memon	RO SAFWCO
11	Abdul Majid	VCS ASF-TAP
12	Jagan Mahar	Local area Trader/Contractor, Matiari
13	Ali Akbar kalhoro	Local area Trader/Contractor, Matiari
14	Raja Bagri	Local area Trader/Contractor, Matiari

List of Participants, Validation Workshop with Stakeholders of Banana Value Chain,

28th September 2013, TAP Regional Office Karachi

Sr#	Name	Designation & Organization
1	Kashif Karim	Business Development Manager -DPT
2	Junaid Hyder Shah	CEO Haider Shah Fruit Farms
3	Raheel N. Shah	Smas Fruit Farm
4	Dr. Tanveer Nizamani	Banana Grower
5	Jamshed Talpur	Banana Grower
6	Sarfraz	Banana Grower
7	Syed Rizwan Ali	Pak Star Farm
8	Hamza Hassan	TAP-JAA
9	M. Aleem	JAA consultant
10	Ameer Hamza	Farmer
11	Syed Ibrahim Ali	Grower
12	Shakeel Ahad	Grower and Transporter
13	Mike Schwartz	DCOP -TAP
14	M. Ismail Kumbhar	Assistant Prof. SAU Tando Jan
15	Shahjahan Hashmani	Project Manager SAFWCO
16	Aslam Pakhali	F.A International Proprietor
17	Derald Smart	TAP-JAA
18	M. Arocha	TAP-JAA
19	Hamid Jalil	TAP-JAA
20	Asad Zahoor	TAP-JAA
21	Shankar Lal Talib	Assistant Director Agri Ext
22	Ghulam Ali Shah Pasha	Qalandar Shahbaz Agro Farm
23	Gulafshan	ASF
24	Rajab Ali	Manager FEG group SAFWCO
25	Kabool	Bookkeeper Safwco
26	Mukhtiar Memon	RO SAFWCO
27	Abdul Majid	VCS ASF-TAP
28	Ayesha Gulzar	NC- ASF-TAP

Note: Contact coordinates of participants are available with the consultant.

Annex B: Cost of Banana Production

Banana Cost of Production

Place	Village Mirzo Shahani, District Matiary						
Grower Name	Average of 10 Growers						
Variety Name:	Bombay						
Acres	1						
Summary	Year 1			Year 2			
Total Gross Income	240,000			240,000			
Total Cost of Production	135,232			113,532			
Net Income (Revenue per Acre)	104,768			126,468			
Value of Production	Year 1			Year 2			
Description	Unit	Qty	Price (PKR/Unit)	Amount (PKR)	Qty	Price (PKR/Unit)	Amount (PKR)
Production per Acre	40 Kgs	400	600	240,000	400	600	240,000
Production Costs per Acre	Year 1			Year 2			
	Unit	Qty	Rate	Amount	Qty	Rate	Amount
Plant Cost	No.	700	12	8,400	0	0	-
Fertilizer							
DAP (50 kg Bag)	No.	4	3900	15,600	4	3800	15,200
Urea (50 kg Bag)	No.	5	1900	9,500	5	1800	9,000
SOP (50 kg Bag) /Ammonium	No.	2	1550	3,100	2	1450	2,900
Plant Protection (Pesticides, Fungicides, Weedicides)							
Various Chemicals	Liter			-			-
Preparation of Land							
Tillage (on basis of renting tractor services) per Acre		6	1200	7,200			-
Seed Bed Preparation				-			-
Making of Ridges for Plantation (Fuel Consumption + Tractor) per Acre				-			-
Sowing of Plants							
5 persons sow 4 Acres in 8 hours shift (4 unskilled laborers + 1 Seed Planter Operator) Average Sowing Cost per Acre	Man hrs	1	5000	5,000			-

Irrigation

Tubewell/Lift	Hrs	24	973	23,352	24	973	23,352
Canal		24	70	1,680	24	70	1,680
Harvesting							
Harvesting Charges per Acre	Times	14	300	4,200	14	300	4,200
Other Costs		8	800	6,400	8	800	6,400
Land Revnue (Malia) per Acre	per acre	1	800	800	1	800	800
Land Lease for crop season	per acre	1	35000	35,000	1	35000	35,000
Casual Labour for the Crop Season	Man hrs	50	300	15,000	50	300	15,000
Cost of Storage		0	0	-	0	0	-
Cost of Production per Acre (in Rs)				135,232			113,532
Cost of Production per 40 Kg				338			284
Cost of Production USD per Metric Ton	USD @	105		80.50			67.58
Cost of Production Rs per Kg				8.45			7.10

Banana Cost of Production

Place	Village Mirzo Shahani, District Matiary	
Grower Name	Haji Essa Khaskhali	
Variety Name:	Bombay	
Acres	32	
Summary	Year 1	Year 2
Total Gross Income	330,000	330,000
Total Cost of Production	147,132	126,532
Net Income (Revenue per Acre)	182,868	203,468

A Value of Production

		Year 1				Year 2			
Description	Unit	Qty	Price (PKR/Unit)	Amount (PKR)	Qty	Price (PKR/Unit)	Amount (PKR)		
Production per Acre	40 Kgs	550	600	330,000	550	600	330,000		

B Production Costs per Acre

		Year 1				Year 2			
	Unit	Qty	Rate	Amount	Qty	Rate	Amount		
Plant Cost	No.	700	12	8,400	0	0	-		
Fertilizer									
DAP (50 kg Bag)	No.	4	3800	15,200	4	3800	15,200		
Urea (50 kg Bag)	No.	5	1800	9,000	5	1800	9,000		
SOP (50 kg Bag) /Ammonium	No.	2	1450	2,900	2	1450	2,900		

Plant Protection (Pesticides, Fungicides, Weedicides)

Various Chemicals	Liter			-			-		
-------------------	-------	--	--	---	--	--	---	--	--

Preparation of Land

Tillage (on basis of renting tractor services) per Acre		6	1200	7,200			-		
Seed Bed Preparation				-			-		
Making of Ridges for Plantation (Fuel Consumption + Tractor) per Acre				-			-		

Sowing of Plants

5 persons sow 4 Acres in 8 hours shift (4 unskilled laborers + 1 Seed Planter Operator) Average Sowing Cost per Acre	Man hrs	1	5000	5,000			-
--	---------	---	------	-------	--	--	---

Irrigation

Tube well/Lift	Hrs	24	973	23,352	24	973	23,352
Canal		24	70	1,680	24	70	1,680
Harvesting							
Harvesting Charges per Acre	Times	16	300	4,800	16	300	4,800
Other Costs		16	800	12,800	16	800	12,800
Land Revenue per Acre	per acre	1	800	800	1	800	800
Land Lease for crop season	per acre	1	35000	35,000	1	35000	35,000
Casual Labor for the Crop Season	Man hrs	70	300	21,000	70	300	21,000
Cost of Storage		0	0	-	0	0	-
Cost of Production per Acre (in Rs)				147,132			126,532
Cost of Production per 40 Kg				268			230
Cost of Production USD per Metric Ton	USD @	105		63.69			54.78
Cost of Production Rs per Kg				6.69			5.75

Annex C: Pakistan Banana Value Chain Situation in Comparison with Indian Banana Value Chain

Key Success Factor for Banana Value Chain Competitiveness (India)	Situation Analysis for Banana Value Chain Competitiveness in Pakistan
Growing Conditions (Comparative Advantage)	Pakistan has similar growing conditions in several regions (Coastal belt of Sindh and Balochistan and plains of Sindh where soil, climate and irrigation water is available for banana cultivation. A comparative advantage exists.
Precision cultivation practices (GAP) or BAPs (Best Agriculture Practices)	Banana production in Sindh lacks these practices by and large. Precision irrigation techniques, balance nutrition (fertigation) and integrated pest management (IPM) are seldom practiced. Bulk of the irrigation is through surface irrigation (flood irrigation), broadcasting of chemical fertilizers irrespective of soil nutrient levels and irrespective of plant requirements at a particular stage of production cycle; indiscriminate use of plant protection chemicals
Farm Economics/Size	Farm size varies from 2-3 acres to hundreds of acres. Small size does not allow economies of scale and mechanization, resulting in poor efficiencies in several processes.
Harvesting and handling practices/techniques on Farm	Apart from a few progressive growers, the harvesting and handling practices are traditional; banana bunch management of tree, harvesting at an appropriate maturity level, transfer to pack house and loading on trucks. Due to absence of proper collection points on farm, pack house, chain transfer system and purpose built transportation means, banana quality is badly affected. On farm infrastructure is practically non-existent.
Supply Chain Management (end to end cool chain)	Banana Supply Chain management is traditional, transportation to market; ripening and storage are done in a traditional manners. Due to absence of purpose built transportation means, cold storage facilities, banana quality is badly affected.

Effective Extension Services	Growers express dissatisfaction over the availability and quality of advice from the government extensional services. Few progressive growers in Tando Allayar have organized a network to provide necessary advice and services to other growers in the area. The scale and outreach of services is limited to growers in the vicinity only. This however is indicative of a good initiative on part of growers.
Local Production and use of certified plants (Tissue Culture)	Supply of plants propagated in Tissue Culture labs is limited and price per plant is 10-12 times of other plantlets or suckers available. Availability and more so affordability of disease free certified plants is essential for improving yields and reducing disease related threats.
Banana Product Improvement through R&D (G 9)	G 9 variety plants have been brought from India through informal means. R&D in Pakistan has not produced any improved varieties over the decades.
Effective Export Promotion and Market Linkage Facilitation by APEDA	Although TDAP, PHDEC and ASF has been supporting growers'/exporters' participation to international trade fairs, banana value chain participants have not been exposed to the most competitive banana value chains of the world.
Branding	A significant value is generated through proper branding and marketing of horticulture produce in several value chains. Branding is practically non-existent at the moment. Some exporters are packing as per label requirements of banana importers.

www.asf.org.pk
www.agribusiness.org.pk

