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Pakistan FIRMS Project Sector Assessment

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ABBREVIATIONS

AIGS	Asian Institute of Gemological Sciences
BPO	Business Process Outsourcing
CGET	Government Colleges and Elementary Education
CMMI	Capability Maturity Model Integration
CRM	Customer Relationship Management
DASP	Dir Area Support Program
DFID	UK Department for International Development
EFA	Education for All
EPI	Export Prospects Index
ERP	Enterprise Resource Planning
EU	European Union
GAP	Good Agricultural Practices
GDP	Gross Domestic Product
GGIP	Gems and Gemological Institute of Peshawar
ISIC	International Standard Industrial Classification
NED	Nadirshaw Edulji Dinshaw
NGO	Non-governmental organization
NWFP	North West Frontier Province
PASDEC	Pakistan Stone Development Company
PGJDC	Pakistan Gems and Jewelry Development Company
PISDAC	Pakistan Initiative for Strategic Development and Competitiveness
PSEB	Pakistan Software Export Board
PTC	Primary Teaching Certificate
RCA	Revealed Comparative Advantage
SMEDA	Small and Medium Enterprise Development Authority
TDAP	Trade Development Authority of Pakistan
UNESCO	United Nations Educational, Scientific, and Cultural Organization
USAID	United States Agency for International Development

ABSTRACT

This report documents the assessment of sectors important to the Pakistani economy. It recommends twelve grouped sectors, which offer the best opportunity for achieving USAID goals using FIRMS Project resources in each of twenty-six districts identified as "at risk" by USAID. The districts cover all four provinces of the country. The assessment weighted 13 measures that reflect the following:

- industry/market structure (sophistication of the market, number of firms, quality of support institutions)
- international market dynamics (revealed comparative advantage and export potential)
- value chain elements (input-output analysis, value-added, input source, and sales destination)
- potential for employment generation, including employment of women and youth.

The focus of the analysis is a set of 26 "at-risk" districts, which are divided into two subsets, priority districts and secondary districts. The priority districts are Bahawalpur, Buner, Karachi, Larkana, Multan, Peshawar, Quetta, Sukkur, and Swat. The secondary districts are Bannu, Charsada, Dera Ghazi Khan, Dera Ismail Khan, Ghotki, Hangu, Jacobabad, Khanewal, Killa Abdullah, Kohat, Lakki Marwat, Lower Dir, Rajanpur, Shikarpur, Tank, Thatta, and Upper Dir. The recommended sectors are:

- Dairy and Meat Processing
- Educational Services
- Fisheries
- Gems and Jewelry
- Horticulture and Agroprocessing
- Information Technology (IT)
- Leather
- Light Engineering, incl. Surgical & Medical Equip.
- Marble
- Medical Services
- Pharmaceuticals and Botanicals
- Textiles, Apparel, and Carpets

A formal methodology was used to identify the most promising sectors, based on both secondary and primary data collected in the priority districts. Scenario analysis was used to determine how different weightings of the factors used to determine the top sectors affected their rankings and ensure that sectors important at the national level and in priority districts were recommended. Secondary districts were incorporated using principally secondary sources. Their inclusion did not affect the top recommended sectors, but it slightly altered the ranking of some sectors.

The individual sector analyses provide details on the industry; the market and industry structure, particularly in the priority districts; exports and export potential; and employment and workforce development. They also cover the supporting business environment, supporting infrastructure, and support services in the priority districts. Each sector analysis provides recommendations, based primarily on the focus group discussions in the districts but also on recommendations from other USAID projects, other donor projects and reports, and Government of Pakistan initiatives.

CONTENTS

DATA PAGE II
ABBREVIATIONS III
ABSTRACT IV
CONTENTS V

EXECUTIVE SUMMARY 1

SUMMARY OF ASSESSMENT STRATEGY AND RESULTS 3
SECTOR ASSESSMENT 7
SECTOR-BY-SECTOR ASSESSMENTS 23
DAIRY AND MEAT PROCESSING 24
EDUCATIONAL SERVICES 29
FISHERIES 34
GEMS AND JEWELRY 41
HORTICULTURE AND AGROPROCESSING 47
INFORMATION TECHNOLOGY (IT) 58
LEATHER 64
LIGHT ENGINEERING 71
MARBLE 77
MEDICAL SERVICES 83
PHARMACEUTICALS AND BOTANICALS 89
TEXTILES, APPAREL, AND CARPETS 93

ANNEX A - SIGNIFICANT SHIFT IN DISTRICT FOCUS 102

EXECUTIVE SUMMARY

The sector assessment documented in the report was required by the Task Order governing the FIRMS Project in order to enable USAID and the FIRMS Project to focus resources on the most economically promising sectors. Under its Private Sector Development component, the Task Order called for the FIRMS Project to complete the following:

*"**Expand sectors supported**. Analyze industrial sectors that have not received prior USAID support. Additional sectors, including agricultural sectors, supported should be based on their contribution to the district and national economy, potential for job creation and exports, and polentia1 for assimilating women at all levels for the selection of sectors. The additional sectors considered for USAID support by the Contractor should include, but not be limited to, textiles, auto parts manufacturing, light engineering, sanitary ware, ICT, sports goods and sports garments, pharmaceutical, leather and leather products, hotels & restaurants, entertainment and retail trade sectors. Any innovative ideas about the sectors and sector selection are encouraged. Sectors previously supported by PISDAC (Marble & Granite, Gems & Jewelry, Furniture, Dairy, Horticulture and Surgical Instruments) should also be analyzed to determine if continued USAID assistance is warranted"*

The original districts that USAID asked the FIRMS and other projects in the Mission's economic growth portfolio to target consisted largely of the twenty largest economic districts in Pakistan. However, between the issuance of the Task Order and the design of the sector assessment, USAID, reflecting broader, more urgent Pakistani Government and U.S. Government priorities, asked FIRMS and other projects to target a new set of twenty-six districts. The original districts and the new set of districts are illustrated in Annex A, which also identified the seven districts that are common to both and identifies eleven districts that USAID deemed as priorities.

In addition to their increased number, these districts represented a sixty percent increase in land area, a significant drop in population density, and a much more diverse, more agricultural and significantly less industrial economic profile, and much greater emphasis on the security-challenged NWFP, all factors which contributed to an increase in the complexity, time requirements, and cost of the assessment. This new focus required a shift in methodology. For example, in order to ensure that FIRMS subsequent work would deliver support to beneficiaries in each of the twenty-six districts, several related sectors (e.g. dairy and meat processing, both livestock related) which would normally be assessed separately, were grouped to ensure maximum geographic coverage. In addition, while both primary and secondary research underpinned sector selection in the priority districts, time constraints limited assessment in the remaining fifteen districts to secondary research only in order to more quickly determine whether the sectors selected for the priority districts were also appropriate for the remaining fifteen.

Based on the research, which is described in greater detail in subsequent sections of this report, it is recommended that USAID formally approve the following twelve sectors as the primary subsequent focus of the FIRMS Project:

- Dairy and Meat Processing
- Educational Services
- Fisheries
- Gems and Jewelry
- Horticulture and Agroprocessing
- Information Technology (IT)
- Leather
- Light Engineering, incl. Surgical & Medical Equip.
- Marble
- Medical Services
- Pharmaceuticals and Botanicals
- Textiles, Apparel, and Carpets

The FIRMS Project, based on preliminary verbal approval by USAID following presentations in Islamabad and Lahore on October 30, 2009 and November 18, 2009, respectively, has commenced activities. The activities will lead to completion of the next major requirement in the Private Sector Development component of the Task Order, that is, the development of comprehensive strategies for sector value chains within these twelve recommended sectors. To expedite the delivery of FIRMS Project resources, the mango value chain under the grouped sector entitled Horticulture & Agro-processing was commenced in advance of the completion of this sector assessment.

SUMMARY OF ASSESSMENT STRATEGY AND RESULTS

The methodology used for this sector assessment departs from these general approaches by bringing in a strong district-level dimension that, while intersecting the national perspective, gives strong weight to factors that will drive a bottom-up, rather than a trickle-down, approach to development. The methodology combines traditional top-down analytical tools with several bottom-up measures gained from primary research in the districts. Criteria were also included that incorporate project priorities, particularly increasing employment of youth and women. Four main categories of criteria and the indicators were used:

1. Industry/market structure
    - Sophistication of the market
    - Number of firms
    - Support institutions

2. International market dynamics
    - Compatibility with Pakistan's comparative advantage, measured by revealed comparative advantage (RCA)
    - Export potential, measure by the exports potential index (EPI)

3. Value chain elements
    - Domestic linkages, based on input-output analysis
    - Value-added
    - Input source and sales destination

4. Potential for employment generation, particularly for youth and women.

The assessment strategy rated the sectors based on 13 measures that cover the four main categories of criteria for selection. The weights for the measures reflecting international competitiveness, national importance, and district importance were varied, to ensure that the analysis captured sectors that were both of national importance and key in the priority districts. An initial balanced weighting among national-level and district-focused criteria produced the top 20 sectors. The weightings were then adjusted to favor district-focused and then national-level criteria to determine which sectors, not in the top 20 sectors produced by the balanced weighting, ranked highly. The resulting scenario analysis yielded four sets of rankings. The results of the assessment strategy are summarized below. They are in alphabetical order.

1. Dairy and Meat Processing ranks below 20 in the balanced weighting scenario, primarily because dairy, livestock, and meat products are not exported in large quantities. Increasing the weighting of the presence in the priority districts and decreasing the weighting of exports elevated the dairy sector from 27th to 12th and raised the livestock sector's rank from 25th to 16th and meat processing from 39th to 18th. This integrated cluster is important for several reasons: (a) it retains employment in the districts, with many backward and forward industry linkages; (b) the value chain uses a number of services, adding value and creating additional employment; and (c) it is an important source of food for many households. Dairy and meat processing are present in at least 20 of the 26 priority and secondary districts.

2. Educational Services is the 17th-ranked sector in the balanced scenario, thanks to its strong employment potential, including for women. It ranks in the top 10 for output destination and

output source, meaning that the forward and backward educational links within the district are strong. There is also strong demand: in Quetta, for example, a focus group of 16 business leaders ranked educational services as the number one sector in terms of demand and employment potential. Educational services provide one of the strongest direct (measurable) and spillover domestic linkages within a locality. The sector provides direct employment of teachers, administrators, support staff, and service providers to institutions and it improves skills, which in turn increase productivity, quality, and competitiveness in industry and agriculture.

3. Fisheries is the 9th-ranked sector in the balanced scenario. It ranks 7th on RCA, EPI, and backward and forward linkages; 8th on employment of women; 10th on input source; and 11th on employment of youth. Most of the downstream segment of the sector, especially the export-oriented business, is based in Karachi, but there are also significant clusters of upstream and downstream activity in the inland waters of the priority districts of Charsada, Larkana, and Sukkur, as well as in five secondary districts. Inland fish farming has seen dramatic increases during the last two decades, particularly in the provinces of NWFP and Sindh.

4. Gems and Jewelry ranks 16th in the balanced scenario but 9th in the scenario that gives a heavier weighting to presence in the priority districts. It has many forward and backward linkages to the national economy (ranked 2nd), creates employment (ranked 5th), particularly for youth (ranked 3rd), and generates relatively high output per employee (ranked 5th.) The sector is important in Peshawar, Karachi, Bahawalpur, and Larkana. The deterioration in the law and order situation in the northern areas of Pakistan, whence the raw material is extracted, has disrupted the supply chain. In Peshawar 80 percent of firms are experiencing losses. Stabilization of the situation in the north and modernization of the sector could allow its enormous potential to be realized.

5. Horticulture and Agroprocessing includes fruits (the official trade statistics category is fruits, nuts, and spices) and vegetables. Fruits rank 6th in overall growth and employment prospects in the priority districts, thanks to the large number of entities engaged in the industry, the RCA (ranked 5th), and the EPI (ranked 4th). Vegetables rank 14th in the sector assessment, due to the sector's presence in the priority districts (vegetables are raised in 10 priority districts). Vegetables are also important in a number of secondary districts (Dera Ghazi Khan, Jacobabad, Khanewal, Lakki Marwat, Rajanpur, Tank, and Thatta), reinforcing its high ranking. The sector scores poorly in export dynamics and only moderately in other key criteria, such as employment.

6. Information Technology is a very high value-added sector that contributes directly to virtually all other sectors. It ranks in the top 20 sectors (18th) when the importance to the national economy is more heavily weighted and when the secondary districts are added to the balanced weighting (19th). Because of its small size in most of the selected districts (exceptions include Multan and Karachi) and low export penetration, it ranks low in the other scenarios. The importance of the sector cannot be underestimated, however, given its spillover effects to other sectors and the potential for creating IT–enabled jobs in the districts. Pakistan already has a substantial IT industry, with more than 1,000 enterprises producing goods and services worth about $2 billion a year, half of which are exported. Such figures place it well ahead of other higher-profile countries, such as Vietnam and many countries in Eastern Europe.

7. Leather, which include hides, skins, tanning and leather products, ranks 13th in the balanced scenario. Its relevance emerges from relatively strong international market dynamics: RCA is ranked 10th (index value of 13.4), EPI is ranked 11th (index value of 1.2), and forward and backward linkages are ranked 11th. At the district level, backward linkages appear to be weak: input source is ranked 21st and output source 11th, suggesting that districts such as Charsada,

Multan, and Karachi use raw material from other nonpriority districts to manufacture leather goods such as luggage and shoes, which are sold in other priority districts or abroad.

8. Light Engineering, including Surgical Instruments. Surgical and medical instruments are key exports for Pakistan. As a result, the sector ranks 10th, with RCA ranking 8th and EPI ranking 5th. Sialkot remains the hub of the industry, but significant production, distribution, and marketing also take place in Karachi and Lahore, and there is some small production in other priority districts.[1] The sector is a significant employer, ranking 6th for overall employment and 5th for youth employment in the balanced scenario. Other parts of the sector include production of transportation equipment, household appliances, consumer durables, auto parts, and agriculture implements as well as automotive repair. There appears to be growing activity in these areas in Bahawalpur, Karachi, Khanewal, Lahore, Peshawar, Quetta, and Sialkot. Developing skills in industries such as automobile and agricultural implements provides a base to support the growth and diversification of the light engineering sector, and it prevents human resources from being diverted to activities such as making arms.

9. The marble sector ranks 12th in the balanced scenario, thanks to its relatively high rankings in value-added (4th), output per employee (6th), backward and forward linkages (6th), national and international markets (7th), and youth employment (12th). The sector is present in five priority districts (Peshawar, Lower Dir, Buner, Charsada, and Lakki Marwat).

10. Medical Services ranks 7th, thanks to its high scores on value retention (6th), backward and forward linkages (9th) within priority districts; high demand; and potential for employment (2nd overall, 5th for women). Women represent a relatively large share of employment, especially in basic care. The sector's benefits extend beyond the sector itself: health care plays a key role in determining the quality of human capital. Better health improves the efficiency and the productivity of the labor force, contributing to economic growth and improvements in human welfare.

11. Pharmaceuticals and Botanicals ranks 8th in the balanced scenario. It is one of the main employment-generating industries in Pakistan, ranking 2nd on overall employment, 3rd on female employment, and 4th on youth employment. The sector ranks 3rd in forward and backward linkages. Although the sector thrives at the domestic level, it has only recently begun exporting, which explains its low RCA (ranked 22nd). Regulatory restrictions are tight, especially on imports from other developing countries and exports of generics. However, some exporters from Karachi have tapped into the burgeoning international herbal medicine market, the growth of which in high-income countries bodes well for producers.

12. The **textiles, apparel, and carpet** sectors account for more than 67 percent of Pakistan's export earnings, 46 percent of its manufacturing, and 40 percent of its manufacturing employment.[2] The sectors are engines for export earnings and employment opportunities for small and medium-size enterprises as well as the larger industries involved in the cotton-to-garment value chain.[3]

Within this industry, there are five key subsectors:

[1] SIMAP, Board of Investment Light Engineering Sector Report and Presentation " Strategy for Up gradation of Surgical Instruments & Medical Device Industry"

[2] 2008 Pakistan Central Bank data.

[3] Bahawalpur Sector Assessment

- **Preparation and spinning of textiles** is the 4th-ranked sector, based on its presence in Karachi and Bahawalpur.
- **Embroidery** is the 2nd-ranked sector. It is heavily represented in eight priority districts and ranks 3rd overall in terms of business presence. Machine embroidery ranks 3rd in EPI and 4th in RCA, making it one of the most competitive industries in Pakistan.
- **Made-up[4] and other textile articles** are materials that are cut into squares and rectangles, produced in the finished state for use, simply hemmed, cut to size after undergoing a process of drawn threat work, or assembled together. They include towels and cleaning cloths, bed linens, blankets, curtains and furnishings, canvas products, and table linens. Pakistan is the world's 2nd-largest exporter of made-up articles.
- **Apparel** ranks 1st in EPI, 3rd in RCA, and 7th in value-added and female employment. It is represented in seven priority districts. Value-added is 30 percent—considerably higher than in most countries. The high value-added is partially explained by the sector's backward linkages to the textile, yarn, and cotton industries, which is not a common feature in many other competing developing countries.
- **Carpets** ranks 5th overall, ranking 2nd in RCA and 6th in EPI. It ranks 3rd in value-added inside Pakistan, 4th for overall employment, and 3rd for employment of women.

The following section more fully describes the methodology, and the remaining section of this report provides details on each sector based on both secondary research and the primary research conducted in the priority districts. Primary research conducted included focus group discussions and surveys for priority sectors in each district. The individual sector analyses provide details on the sector and market structure, particularly in the priority districts; exports and export potential, and employment and workforce development. They also cover the supporting environment, supporting infrastructure, and support services in the priority districts. The analysis draws heavily on the district-level information gathered from secondary sources in the priority and secondary districts, industry-specific focus group discussions in the priority sectors, and surveys conducted in the priority districts. Each sector analysis provides recommendations, based primarily on the focus group discussions in the districts but also on recommendations from other USAID projects, other donor projects and reports, and Government of Pakistan initiatives.

Mr. Sarboor Kakar, District Coordination Officer and Mr. Kamal Uddin, former Chamber of Commerce and Industry (CCI), Quetta, participate in focus group.

[4] Made-up articles include materials (a) cut into squares or rectangles; (b) produced in the finished state, ready for use without sewing or other working (for example, towels, tablecloths, scarf squares, blankets); (c) hemmed, with rolled edges, or with a knotted fringe at any of the edges (d) cut to size and having undergone a process of drawn thread work; (e) assembled by sewing, gumming, or other means; or (f) knitted or crocheted to shape (based on USTSUS Section notes).

SECTOR ASSESSMENT

USAID's portfolio of programs for Pakistan focuses on at-risk districts—districts in which economic growth and employment are critical for stabilization. This assessment analyzes industry and service sectors in Pakistan to recommend the top 12 sectors in terms of market potential, employment potential, and presence in the priority districts, plus two secondary districts (Bannu, Bahawalpur, Buner, Charsada, Karachi, Larkana, Lower Dir, Multan, Peshawar, Quetta, and Sukkur).

The assessment relies heavily on primary and secondary data collected in the priority districts. Analysis of remaining districts (Dera Ghazi Khan, Dera Ismail Khan, Hangu, Ghotki, Jacobabad, Khanewal, Kohat, Lakki Marwat, Qila, Rajan Pur, Shikarpur Abdullah, Swat, Tank, Thatta, and Upper Dir) was incorporated as a robustness test to confirm the selection of sectors based on the priority districts and to ensure that no sector was inadvertently overlooked during the first phase of analysis. The data on secondary districts were derived from secondary sources.

METHODOLOGY

Most approaches for selecting promising sectors focus on maximizing returns at the national level. To take into account the focus on specific districts, the methodology used by this assessment is based on a two-prong strategy. A top-down method incorporates Pakistan's international comparative advantage. A bottom-up approach ensures a focus on competitive industries in the priority districts and is based on district-level production, employment, and value-chain capture data. By combining these two approaches through weighted scores, the analysis identifies a mix of economically promising sectors that generate and retain significant value within the districts, have links to other priority districts, and are important nationally and internationally. Criteria were also included that incorporated project priorities, particularly the creation of employment for youth and women.

CRITERIA

Four basic criteria, each made up of several indicators, were used to evaluate the sectors:

1. Industry/market structure
   a. Sophistication of market
   b. Number of firms
   c. Support institutions

2. International market dynamics
   a. Compatibility with Pakistan's comparative advantage, measured by Revealed Comparative Advantage (RCA)
   b. Export potential, measured by Export Prospects Index (EPI)

3. Value Chain elements
   a. Domestic linkages, based on input-output analysis
   b. Value-added
   c. Input source and sales destination

4. Potential for employment generation (including employment of women and youth)

Items 1, 3b, 3c, and 4 constitute district-level bottom-up dimensions; items 2 and 3a capture the top-down dimension. The methodology thus focuses on maximizing returns for high-priority districts in industries that are competitive at the national level but that also have a large presence and competitive advantages in the high-priority districts.

To achieve a balance, we weighted the criteria. We also conducted sensitivity analysis by varying the weights to determine which sectors ranked highest because they were nationally important and which ranked highest because of their presence in the priority districts. The following provides an overview of some of the key international market and value chain indicators.

INTERNATIONAL MARKET DYNAMICS AND POTENTIAL

International trade reveals key characteristics of a country and its industry. Export of a product or service generally indicates its competitiveness; the more diversified the destination markets, the stronger the measure of competitiveness. International trade also reveals attributes of a country's comparative advantage, in terms of resources, technology, or other features that distinguish it from the rest of the world. Two measures describe competitiveness and the potential for exports, revealed comparative advantage (RCA) index and the export prospects index (EPI).

Having established international trade constitutes a key criterion for sector selection. A primary tool that defines a country's relative strength is the RCA index, developed by Balassa in 1952. The formula for the RCA index is as follows:

$$\mathrm{RCA}_{ij} = (x_{ij}/X_{it})/(xw_j/Xw_t),$$

where x_{ij} and x_{wj} are the values of country i's exports of product j and world exports of product j and where X_{it} and X_{wt} refer to the country's total exports and world total exports. [5] The RCA indicates whether a country is in the process of growing its international market share in the products in which it has trade potential. It can also provide useful information about potential trade prospects with new partners. This index can be used to measure RCA at the detailed product level (ISIC or HS) level.

EXPORT PROSPECTS INDEX

To reinforce the RCA static analysis, we use a second tool, the Export Prospects Index (Trade Map) that combines comparative advantage mapping with global demand for products. Plotting increases and decreases in market growth and market share, we map (a) winners in growing sectors, (b) winners in declining sectors, (c) losers in growing sectors, and (d) losers in declining sectors. Plotting these sectors and assigning an RCA index provides a powerful indicator of current and potential trade prospects for given sector.

VALUE CHAIN-RELATED MEASURES

To capture the district dimension, value chain analysis identifies performance gaps and the main constraints to a sector's competitiveness. Such analysis helps prioritize constraints that directly affect the overall competitiveness of the value chain. For this assessment, we limited our value chain analysis to measuring forward and backward linkages (source of inputs and destination of output) and determining the value-added.

[5] Balassa, Bela, "Trade Liberalisation and ´Revealed´Comparative Advantage," Manchester School of Economics and Social Studies 33 (1965): 99-123.

- **Input-Output Analysis.** Input-output analysis is used to understand the economic structure of a country at the industry level. Initially developed by Leontief, in 1936, an input-output matrix depicts the inter industry relations of an economy. It shows how the output of one industry is an input to other industries. It considers the various economic sectors as a series of inputs of source materials (or services) and outputs of finished or semi finished goods (or services). These input-output tables are used to diagnose some of the most complex economic problems as well to understand forward and backward linkage. As seen in the formula below,

$$FL_i = \frac{\frac{i}{n} B_i .}{\frac{i}{n_2} \sum_{1=i}^{n} B_i .}$$

- **Value-added.** Value-added is defined as the difference between the cost of materials and labor to produce a product and the sale price of the product. It captures the presence and extent of value at a factory or farm. The standard international convention is that 40 percent or more value-added of output is considered high. For the assessment, we assigned a score of 3 for value-added of 40 percent or higher, a score of 2 for value-added of 32 percent–39.9 percent, and a score of 1 for value-added less than 32 percent.

- **Input Source and Sales Destination.** If the input source is from the same district or another priority district, the sector was assigned an above-average score (3). If inputs were from other areas of Pakistan, an average score (2) was assigned. If inputs came from abroad, a below- average score (1) was assigned. The rationale was to prioritize sectors that have value chains that add value within Pakistan. If the output was sold internationally, the sector was assigned an above-average score (3). The rationale is that an exported item reflects stability and sustainability of a sector. Sectors for which outputs are sold primarily in Pakistan but outside the district were assigned an average score (2). For sectors mostly sold within the district, they received a 1.

DATA COLLECTION

The analysis relies on two sources of data. The top-down analysis—RCA, EPI, and input-output linkages—are of national relevance and compiled at the national level. The bottom-up analysis introduces the district dimension. Some elements are based on published data; others necessitated primary data collection at the enterprise level. Such primary data include survey data on sources of inputs, value-added data, and sources of output. Because reliable comprehensive published sources at the district level are absent, the survey was also designed to gather information on support services available, supporting infrastructure, including availability of utilities; access to markets; skill levels; product and process standards; support institutions; and impediments to business. This information is included in the sector write-ups.

One initial criteria missing from the analysis is employment of internally displaced persons. Because this population is fluid with new internally displaced persons arriving in districts and others returning home the data collected were not reliable and were therefore not used in the assessment.

ASSESSMENT STRATEGY

The methodology uses a weighted index and then changes the weights of the criteria to identify the most promising sectors for support. The methodology uses a three-step process that ranks the 38 ISIC four-digit sectors compiled through primary and secondary data collection at the district level. The subsequent aggregation of sectors yields a list of 30 sectors. The three-step assessment process is described below.

Focus group discussion in Quetta

STEP 1

Two strategies are adopted to score and rank sectors. First, all factors based on primary and district-level data (industry market structure, value-added, and employment) are assigned scores of 1–3. For example, above-average employment receives a score of 3, up to 20 percent below this figure receives a score of 2, and more than 20 percent below this figure receives a score of 1.

Three additional factors are part of the assessment criteria. The first two—the number of enterprises in districts in a sector and the number of survey responses collected in a sector—require straightforward sorting and ranking of reported data. The third—presence in priority districts—is based on the number of priority districts engaged in the sector. The greater the presence, the higher the rank.

For top-down analysis, we calculate RCA, EPI, and input-output indices. RCA index values above 1 indicate that a sector has a comparative advantage in a sector. An EPI index above 1 indicates that the sector is gaining international market for which the demand is growing or steady. We assign a score of 3 if an RCA and EPI value for a given sector is above 1. If RCA and EPI index values are 0.50–0.99, we assign a score of 2. For values below 0.5, we assign a score of 1. For the forward and backward index, we take the average index values. Each sector is then assigned a score for each index, based on its performance relative to the average. Sectors with average scores or better are assigned a score of 3; those that score no more than 20 percent below the average are assigned a 2, and those that score more than 20 percent below the average are assigned a score of 1.

STEP 2

The average ranking is calculated based on all responses for all sectors. For each criterion, sectors are ranked according to their scores. Each criterion is assigned a weight. Weights were varied to capture sectors that may have been missed in the initial balanced weighting scenario.

STEP 3

The product of the weights and ranks are added together to provide the final overall scoring and ranking of sectors.

STEP 4

Data from the secondary districts were incorporated as a robustness test of the results of the analysis of the priority districts. The assessment process follows Steps 1–3, based on aggregate data for individual districts.

Table 1 summarizes the indicators used in the analysis and indicates the source of the data.

Table 1: Criteria for Analysis and Data Source

Criterion	Data Source
Industry market structure	
Number of firms	Secondary survey
Number of survey	Primary survey
International market dimension	
Revealed comparative advantage (RCA)	Import and export data from UN COMTRADE
Export prospects index (EPI)	Import and export data from UN COMTRADE
Value chain elements, backward-forward linkages	
Domestic linkages	Input-output data from GTAP global database
Value-added	Primary survey
Input source	Primary survey
Output destination	Primary survey
Output per worker	Primary survey
Employment	
District employment	Primary survey
Women employment	Primary survey
Youth employment	Primary survey

WEIGHTING CRITERIA

The analysis examines four scenarios, each with different factor weights (Table 2). A theoretically based weighting has its merits, but it risks squeezing out a sector that is present in many districts but does not score well on the major criteria defined by the weighting process. In order to mitigate such a possibility, we looked at several alternative scenarios that changed the weightings of various criteria. Consistent with USAID's goals, a heavier weight is consistently assigned to the employment of women, although Scenarios 4 and 5 reduces it from 15 to 8 percent.

SCENARIO 1

Scenario 1 assigns balanced weights to top-down market indicators and bottom-up value chain and presence indicators; it also gives weight to employment, especially female employment. Scenario 1 therefore has the merit of providing balanced treatment of market dynamics, value-chain criteria, and spillover social-economic elements. The value chain and domestic linkages indicators receive a combined weighting of 41 percent. As employment appears to be heavily male dominated, female and youth employment are weighted separately. Combined employment indicators receive a weight of 27 percent. The top-down indicators receive 20 percent. The remaining weight is apportioned to characteristics of industry structure, including the extent of clustering within the districts.

SCENARIO 2

Scenario 2 assigns more weight to the district dimension. Specifically, it more heavily weights the presence of the industry in the district and the density of firms in the industry in the district. Three criteria—the number of firms in the district, the response rate, and the presence criteria—are weighted at 35 percent.

SCENARIO 3

Scenario 3 ensures that the sector selection includes industries of critical national importance with some presence in the priority districts. This scenario weights market dynamics criteria more heavily than the district-level criteria. RCA is assigned a weight of 20 percent (compared with 10 percent in the balanced scenario); EPI is assigned a weight of 15 percent (compared with 10 percent in the balanced scenario). The output destination is assigned a 10 percent weight and is also an export measure, since a score of 3 means the product is primarily exported. These measures evaluate the relative strength of the sector from a national perspective. They also convey a powerful sense of the prospects of a sector from an international perspective.

SCENARIO 4

Scenario 4 is a blend of Scenarios 2 and 3. It places more weight on industry presence and top-down criteria relative to district-level analysis and less weight on project priorities. The approach relies on market strength and industry presence for sector assessment, but district-level elements still account for about 40 percent of the total weight.

Table 2: Weights of each Criterion for the Various Scenarios

Criterion	Scenario 1 Balanced weighting of top-down, district-focused, and other criteria	Scenario 2 Increased weighting of number of enterprises, responses, and presence in priority district	Scenario 3 Increased weighting of top-down criteria	Scenario 4 Increased weighting of top-down and business presence criteria
Number of firms	7	15	5	10
Number of surveys	2	10	1	5
Revealed comparative advantage (RCA)	10	5	20	20
Export prospects index (EPI)	10	5	15	15
Domestic linkages (input-output)	5	6	10	10
Value-added	8	5	5	5
Input source	8	5	10	5
Output destination	15	10	10	10

Criterion	Scenario 1 Balanced weighting of top-down, district-focused, and other criteria	Scenario 2 Increased weighting of number of enterprises, responses, and presence in priority district	Scenario 3 Increased weighting of top-down criteria	Scenario 4 Increased weighting of top-down and business presence criteria
Output per worker	5	4	5	5
District employment	5	5	10	5
Women employment	15	15	8	8
Youth employment	10	5	1	1
Presence in priority districts	0	10	0	2

RESULTS OF SECTOR ASSESSMENT

The following provides an overview of the results of each of the scenarios.

SCENARIO 1 RESULTS

Manufacture of wearing apparel (ISIC code 1730), one of Pakistan's most important economic activities and top-ranked exports, ranks 1st among priority districts (Table 3), thanks to its relatively strong international market ranking. The sector scores well in EPI (ranked 1st), RCA (ranked 3rd), value-added (ranked 7th), and female employment (ranked 7th), all of which are weighted 10 percent or more in the assessment. The apparel sector is represented in seven of the priority districts; it ranks 6th in the number of enterprises among all sectors (see Table 5). The relatively high value-added (about 30 percent) is considerably higher than that of most countries that manufacture apparel. It partially reflects Pakistan's exploitation of backward linkages to the textile and yarn sectors, not a common feature among competing developing countries other than China and India.

The 2nd-ranked sector, **manufacture of other textiles** (ISIC code 1729), which includes production of towels, tablecloths and bedding as well as embroidery is one of Pakistan's most important economic activities; it is heavily represented in eight priority districts. Survey responses suggest that embroidery has not succeeded as much as other categories in international markets and has a strong district and regional orientation.

Wheat, rice, and cotton growing under **growing of cereal and crops** (ISIC code 0111) ranks 3rd, with a strong presence in nine priority districts, relatively high RCA and EPI values, and strong backward and (particularly) forward linkages. The cotton sector creates forward linkages to the top-ranked wearing apparel sector (ISIC code 1730) as well as to other high-ranking sectors, such as manufacture of other textiles (ISIC code 1729), which is ranked 2nd, and preparation and spinning of textiles (ISIC code 1711), which is ranked 4th. This suggests a potential robust linkage between cotton growing and textiles and apparel value chain activity.

Preparation and spinning of textiles (ISIC code 1711) is the 4th-ranked sector. It is dominated by yarn and lint. Like apparel, it is strong in employment creation, especially for women and youth; international market promise (despite the lack of direct links with international markets); forward and backward linkages; and output per employee. It has a weak presence in the priority districts, with only Karachi and Bahawalpur reporting it as a major economic activity.

Manufacture of carpets and rugs (ISIC code 1722), ranked 5th, displays four notable features: (a) it is a key economic activity in two at-risk districts, Peshawar and Multan; (b) it is the 3rd-ranked sector on employment of women; (c) it is the 3rd-ranked sector on value-added; and (d) it is the 2nd-ranked sector on RCA. These four strengths make carpets and rugs one of the primary sectors that affect livelihoods in Peshawar and Multan today and have the potential to do so for the foreseeable future.

Growing of fruit, nuts, beverage, and spice crops (ISIC code 0113) ranks 6th. In contrast to the textile sector, in this sector the priority districts appear to have strong direct international presence (output destination) but relatively weak backward and forward linkages. There is insufficient processing activity, especially of fruit products, which are instead exported directly in raw form. The sector's prominence reflects the large number of entities and export potential (ranked 5th on RCA and 4th on EPI). This sector is present in five districts. The product categories that emerged as promising are mangoes, honey, dates, spices, and guava.

Medical services (ISIC code 9312), ranked 7th, provides important insight into activities that affect the districts. The sector joined the top sectors mostly as a result of its value retention (services centered on the locality), value-added, and employment. The activity is prominent only in Karachi, but the demand for services was mentioned in a number of priority districts.

Manufacture of pharmaceuticals, medicinal chemicals, and botanical products (ISIC code 2423), ranked 8th, is the top-ranked sector in value-added, the 2nd-ranked sector in female employment, and the 3rd-ranked sector in overall employment. Its relatively low RCA suggests that activity thrives primarily at the domestic level. Karachi is the center for this sector.

Processing and preserving of fish (ISIC 500) ranked 9th, with an above average rank in almost every category, except for value-added and output for employee, which ranked lower than average (23 and 27 respectively out of 30). Although the sector did not rank in the top five for any criteria, it ranked 7th in RCA, EPI, and forward and backward linkages and 9th in presence in the priority districts. The high export-related rankings together with the low value-added and productivity rankings, shows good potential for investment and upgrades in the sector.

Surgical and medical goods (ISIC code 3311), ranked 10th, are one of Pakistan's key exports. The sector also performs well on youth and overall employment in the priority districts, albeit not as well as the pharmaceutical sector. In contrast to the pharmaceutical sector, which is strong domestically and weak internationally, this sector is weak domestically and strong internationally, despite a thriving medical services industry in Karachi.

Construction (ISIC code 513), ranked 11th, emerged as #2 in value-added and output per employee, typical for this industry. It ranked poorly in the export-related criteria, also typical for the industry. Surprisingly, it ranked poorly in presence in the priority districts, in overall employment (#23) and in youth employment (#26).

Marble (ISIC code 1410) ranked 12th having top ten scores in forward and backward linkages (#6), output destination, i.e. exports (#7), value-added (#4) and output per employee (#6). Dragging its overall score down were low rankings in overall employment in the sector (#29), low employment of women (#21), presence in only a few (although important) priority districts (#24) and a surprisingly low EPI score (#22), which could be explained by its decreasing marketshare in growing markets.

Leather products (ISIC codes 1911 and 1912), which includes both tanning and manufacture (luggage and sports goods), ranked 14th. It is a key export sector, as reflected in the sector's RCA and EPI rankings (10 and 11, respectively). Karachi has a large presence in leather goods manufacturing (luggage and shoes), Bannu and Charsada are strong predominantly in leather shoe manufacturing, and Multan has both leather tanning and manufacturing.

The **Growing of vegetables, horticultural specialties, and nursery products** (ISIC code 0112), ranked 14th and was the most frequently named sector in the priority districts and with a significant presence in the secondary districts. The sector's prominence reflects not only a large presence in the priority districts, but also relatively high rankings on value-added, overall employment (#8) female employment (#11), and youth employment (#13). Its low scores reflect unexploited potential related to exports, #23 in RCA, #25 in EPI, and the lack of processing capacity, #27 in backward and forward linkages.

Manufacture of bakery products (ISIC code 1541), ranked 15th, scores high on value-added and youth employment. The sector seems to be largely a district-level activity, with limited backward linkages to the wheat sector. Because bakery products tend to be produced near the markets in which they are consumed, the sector has weak scores for export-related criteria.

Jewelry and related articles (ISIC code 3691), ranked 16th. The sector's prominence partially reflects its relatively strong employment figures (overall #5 and for youth #3) and its strong backward linkages (#2), which are at the national level rather than within a district. It also ranked highly on output per employee (#5). It has low scores for value-added (#26), reflecting the export of unprocessed gems and a low score for employment of women (#26).

Educational Services ranked 17th and ranked highest in terms of overall employment given the number of teachers employed throughout Pakistan. As a service sector, it is not surprising to see a high rank of #7 for input sources and #11 for value added. The need for educational services, including those provided by private institutions, was frequently mentioned in the priority districts.

Several important sectors, such as **dairy,** were not among the top-ranked sectors in the balanced scenario. In fact, its absence led us to question our initial approach of relying on only one weighting scenario, which led us to add the additional scenarios that weighted district-focused criteria more heavily and then national level criteria more heavily. We discovered that when presence in the priority districts was assigned a heavier weight, dairy ranked #12 and farming of cattle, sheep, goats and hogs (livestock) ranked #16. When national level criteria were assigned a heavier weight, information technology appeared in the top 20 sectors

Several of the top-ranked sectors would benefit tremendously by development or strengthening of domestic value chains. The textile and garment value chain—represented by cotton, yarn, garments, and embroidery—as well as carpets and rugs are already vertically linked and have the potential to be globally competitive. Other sectors that may present opportunities, pending further value chain analysis, to create new or strengthen existing linkages include wheat, bakery,

and fisheries, as well as fruits and vegetables, which could be processed to add value. Value chain analysis will allow a more comprehensive analysis of these sectors and reveal the potential for better integrating the districts into the national and/or global economy.

Incorporating data from the secondary districts by and large reinforces the results of the analysis of the priority districts. The 10 top-ranked sectors remain, but their order changes somewhat with the addition of the secondary districts (Table 6). Spinning of yarn and thread moved from fourth place to second and embroidery, towels and sheets moved from second to fourth. Carpet and rugs move from 5th place to 8th, and surgical and medical equipment moved from 10th place to 7th. Information technology and pulp and paper were added to the top 20. The changes stem largely from the higher average scores of secondary districts on some key criteria, such as value-added, employment, and presence in the districts.

Table 3: Ranking of Priority Sectors under Scenario 1

Ranking	ISIC code	Description	Major products
1	1730	Manufacture of wearing apparel	Menswear, boys' wear
2	1729	Manufacture of other textiles not elsewhere specified	Embroidery, towels, sheets,
3	0111	Growing of cereals and other crops	Cotton, wheat
4	1711	Preparation and spinning of textiles (yarn)	Yarn, thread, weavings
5	1722	Manufacture of carpets and rugs	Carpets, rugs, mats
6	0113	Growing of fruit, nuts, beverage, and spice crops	Mango, spices, dates, guava
7	9312	Medical services	General/internal medicine
8	2423	Manufacture of pharmaceuticals, medicinal chemicals, and botanical products	Antibiotics, vitamins, vaccines, homeopathic preparations
9	0500	Processing and preserving of fish	Commercial fishing, fish farming
10	3311	Manufacture of medical and surgical equipment	Instruments, equipment
11	513	Construction	Site preparation, Building construction and completion
12	1410	Quarrying of stone, sand, and clay	Marble
13	1911, 1912	Leather	Tanning, footwear, and sport goods
14	0112	Growing of vegetables, horticultural specialties, and nursery products	Vegetables (various), flowers
15	1541	Bakery products	Bread, pastries
16	3691	Manufacture of jewelry and related articles	Precious stones , jewelry
17	0929	Educational services	Primary, secondary, higher, other
18	0200	Forestry, logging, and related services	Forestry, logging
19	1531	Other food processing	Grain milling, rice milling,
20	3610	Manufacture of furniture	Manufacture of furniture

Table 4: Detailed Rankings of Criteria under Scenario 1

Code	Description	Number of enterprises	Responses	RCA	EPI	Forward/backward linkage	Input source	Output source	Value-added	Output per employee	Overall employment	Employment of women	Employment of youth
1730	Manufacture of wearing apparel	6	6	3	1	16	20	9	7	21	25	7	10
1729	Manufacture of other textiles not elsewhere specified	3	18	4	3	15	13	4	17	11	11	9	15
0111	Growing of cereals and other crops	5	4	9	8	8	16	2	10	13	12	12	16
1711	Preparation and spinning of textile (yarn)	8	24	1	2	12	8	30	19	24	28	1	2
1722	Manufacture of carpets and rugs	7	13	2	6	13	28	20	3	30	4	3	25
0113	Growing of fruit, nuts, beverage, and spice crops	4	3	5	4	29	14	3	15	14	10	13	20
9312	Medical services	13	30	11	10	9	6	16	6	19	2	5	27
2423	Manufacture of pharmaceuticals, medicinal chemicals, and botanical products	27	16	22	9	3	30	26	1	8	3	2	4
0500	Processing and preserving of fish	11	9	7	7	7	10	15	23	27	15	8	11
3311	Manufacture of medical and surgical equipment	10	23	8	5	18	5	28	12	15	6	25	5
513	Construction	18	26	17	20	14	11	22	2	2	23	26	4
1410	Quarrying of stone, sand, and clay	24	12	12	22	6	17	7	4	6	29	21	12
1911, 1912	Leather	21	19	10	11	10	21	12	14	18	21	14	18
0112	Growing of vegetables, horticultural specialties, and nursery products	9	1	25	25	27	15	1	16	10	8	11	13
1541	Bakery products	29	10	20	24	17	4	21	5	1	17	18	9
3691	Manufacture of jewelry and related articles	12	14	18	13	2	22	11	26	5	5	26	3
0929	Educational services	23	17	16	19	25	7	14	11	20	1	15	29
0200	Forestry, logging, and related services	14	11	6	12	26	2	23	30	3	24	29	6
1531	Other food processing	19	21	14	18	21	24	17	8	26	16	16	21
3610	Manufacture of furniture	17	8	23	21	1	26	10	13	22	22	24	8

Table 5: District Presence, By Sector

Code	Description	Bannu	Bahawalpur	Buner	Charsada	Larkana	Lower Dir	Multan	Peshawar	Quetta	Karachi	Karachi2	Sukkur
1730	Manufacture of wearing apparel	X			X		X	X				X	X
1729	Manufacture of other textiles, not elsewhere specified	X	X		X	X		X	X	X		X	
0111	Growing of cereals and other crops	X	X	X	X	X	X			X		X	X
1711	Preparation and spinning of textile (yarn)		X										
1722	Manufacture of carpets and rugs							X	X				
0113	Growing of fruit, nuts, beverage, and spice crops	X	X		X	X		X	X	X		X	
9312	Medical services				X						X		
2423	Manufacture of pharmaceuticals, medicinal chemicals, and botanical products										X		
500	Processing and preserving of fish					X					X		X
3311	Manufacture of medical and surgical equipment										X		
513	Construction										X		
1410	Quarrying of stone, sand, and clay			X	X		X		X	X			
1911, 1912	Leather	X			X			X			X		
0112	Growing of vegetables, horticultural specialties, and nursery products	X	X		X	X	X	X	X	X			X
1541	Bakery products					X							
3691	Manufacture of jewelry and related articles		X			X			X			X	
929	Educational services				X				X			X	
200	Forestry, logging, and related services		X										
1531	Other food processing			X						X			
3610	Manufacture of furniture						X		X	X		X	

Table 6: Ranking of Sectors Using Data from Priority and Secondary Districts under Scenario 1a

Ranking	ISIC Code	Description	Major products
1	1810	Manufacture of wearing apparel	Menswear, boys' wear
2	0111	Growing of cereals and other crops	Rice, Cotton, wheat
3	1711	Preparation and spinning of textile (yarn)	Yarn, thread, weavings
4	1729	Manufacture of other textiles not elsewhere specified	Embroidered textiles
5	0113	Growing of fruit, nuts, spices	Mango, spices, dates, guava
6	2423	Manufacture of pharmaceuticals and medicines	Antibiotics, vitamins, vaccines, homeopathic preparations
7	3311	Manufacture of medical and surgical equipment	Instruments, equipment
8	1722	Manufacture of carpets and rugs	Carpets, rugs, mats
9	9312	Medical services	General/internal medicine
10	0500	Processing and preserving of fish	Commercial fishing, fish farming
11	1541	Bakery products	Baked goods and confectionary
12	3691	Manufacture of jewelry and related articles	Precious stones , jewelry
13	0200	Forestry, logging, and related services	Forestry, logging
14	1911,1912	Leather	Tanned leather, luggage, handbags, leather articles
15	512,513	Construction	Site preparation, Building construction and completion
16	0112	Growing of vegetables, horticultural specialties, and nursery products	Vegetables (various), flowers
17	1410	Quarrying of stone, sand, and clay	Marble
18	2101	Manufacture of pulp, paper, and paper	Paper pulp, paper, newsprint
19	841	Information technology	Software and hardware
20	929	Educational services	Teaching and teacher training

SCENARIO 2 RESULTS

Using the weighting for Scenario 2 does not dramatically change the results of the priority sectors: 8 of the top 10 sectors under Scenario 1 remain, although they are ranked somewhat differently (Table 7). Two sectors—medical services and surgical and medical equipment—fall out of the top 10; both are concentrated mostly in Karachi and therefore lose importance when the district dimension is given more weight. In their place, vegetables and gems and jewelry, both of which rank highly on district-level criteria, join the top 10. Vegetables ranks 5th overall in Scenario 2, thanks to its 1st-place ranking on both the number of responses and the presence across districts (the sector features strongly in nine priority districts). Gems and jewelry emerges as 9th overall, thanks to the sector's high ranking on linkages (2nd), output per employee (3rd), youth employment (3rd), and both output destination and value-added (5th). Dairy products and livestock both join the top 20 sectors in this scenario.

Table 7: Ranking of Priority Sectors under Scenario 2

Ranking	ISIC Code	Description
1	0111	Growing of cereals and other crops
2	0113	Growing of fruit, nuts, beverage, and spice crops
3	1729	Manufacture of other textiles not elsewhere specified
4	1730	Manufacture of wearing apparel
5	0112	Growing of vegetables, horticultural specialties, and nursery products
6	1512	Processing and preserving of fish
7	1711	Preparation and spinning of textile (yarn)
8	1722	Manufacture of carpets and rugs
9	3691	Manufacture of jewelry and related articles]
10	2423	Manufacture of pharmaceuticals, medicinal chemicals, and botanical products
11	9312	Medical services
12	1520	Manufacture of dairy products
13	1410	Quarrying of stone, sand, and clay
14	513	Construction
15	3311	Manufacture of medical and surgical equipment
16	0121	Farming of cattle, sheep, goats, hogs
17	1911, 1912	Leather
18	1541	Bakery products
19	3610	Manufacture of furniture
20	614	Hotels and restaurants

SCENARIO 3 RESULTS

Under Scenario 3, the top 10 sectors remain unchanged relative to Scenario 1, but the ordering changes considerably, as a result of the heavier weighting given to the top-down criteria. This scenario most closely reflects national-level interests in terms of export competitiveness. It is, therefore, unsurprising that Pakistan's strongest export categories, textiles and apparel–related sectors, feature at the top of the chart (Table 8). Surgical and medical equipment, which ranked 8th on revealed comparative advantage and 5th on export potential, moves up to 5th overall. Meat processing appears in this scenario (#20) although dairy and livestock do not. Information technology shows up as #18.

Table 8: Ranking Of Priority Sectors under Scenario 3

Ranking	ISIC Code	Description
1	1729	Manufacture of other textiles not elsewhere specified
2	1711	Preparation and spinning of textile (yarn)
3	1722	Manufacture of carpets and rugs
4	1730	Manufacture of wearing apparel
5	3311	Manufacture of medical and surgical equipment

Ranking	ISIC Code	Description
6	0111	Growing of cereals and other crops
7	9312	Medical services
8	0113	Growing of fruit, nuts, beverage, and spice crops
9	1512	Processing and preserving of fish
10	2423	Manufacture of pharmaceuticals, medicinal chemicals, and botanical products
11	3691	Manufacture of jewelry and related articles
12	1911, 1912	Leather
13	513	Construction
14	1410	Quarrying of stone, sand, and clay
15	0200	Forestry, logging, and related services
16	1541	Bakery products
17	0929	Educational services
18	841	Information technology
19	1531	Other food processing
20	1511	Production, processing, and preservation of meat

SCENARIO 4 RESULTS

In Scenario 4, 9 of the top 10 sectors in Scenario 1 remain, although the order changes as a result of the increased weighting given to the density criterion. The only sector that drops out from this scenario is pharmaceuticals, which is replaced by gems and jewelry, which has a strong presence in four of the priority districts. Meat processing moves up to #17 and Information Technology is once again included (#20). Gems and jewelry and meat processing have low rankings for employment of women, which is why their scores improved when employment of women has less weight.

Table 9: Ranking Of Priority Sectors under Scenario 4

Ranking	ISIC code	Description
1	1729	Manufacture of other textiles not elsewhere specified
2	1711	Preparation and spinning of textile (yarn)
3	1730	Manufacture of wearing apparel
4	0113	Growing of fruit, nuts, beverage, and spice crops
5	0111	Growing of cereals and other crops
6	1722	Manufacture of carpets and rugs
7	1512	Processing and preserving of fish
8	3311	Manufacture of medical and surgical equipment
9	9312	Medical services
10	3691	Manufacture of jewelry and related articles]
11	1911, 1912	Leather
12	2423	Manufacture of pharmaceuticals, medicinal chemicals, and botanical products

Ranking	ISIC code	Description
13	0200	Forestry, logging, and related services
14	513	Construction
15	1410	Quarrying of stone, sand, and clay
16	1541	Bakery products
17	1511	Production, processing, and preservation of meat
18	0929	Education
19	0112	Growing of vegetables, horticultural specialties, and nursery products
20	841	Information technology

COMBINING THE RESULTS OF THE VARIOUS SCENARIOS

Recommended sectors include nine of the top ten sectors in the balanced scenario (all except commodity crops) and several sectors from the alternate scenarios, such as dairy, vegetables, gems and jewelry, IT, and marble. Related sectors, such as dairy and meat processing, and fruits and vegetables were combined in our categorization. The next section provides details on the recommended sectors, which are as follows:

- Dairy and Meat Processing
- Educational Services
- Fisheries
- Gems and Jewelry
- Horticulture and Agroprocessing
- Information Technology (IT)
- Leather
- Light Engineering, including Surgical and Medical Equipment
- Marble
- Medical Services
- Pharmaceuticals and Botanicals
- Textiles, Apparel, and Carpets

SECTOR-BY-SECTOR ASSESSMENTS

DAIRY AND MEAT PROCESSING

The dairy and meat processing sectors all rank below 20 in the balanced weighting scenario, primarily because their products are not exported in large quantities. Increasing the weighting of the presence in the priority districts and decreasing the weighting of exports elevates the dairy sector from 27th to 12th and the inputs for dairy and meat processing (livestock sector) from 25th to 16th.

Livestock are at the heart of Pakistan's rural socioeconomic system. It provides many essential food items, such as meat, milk, and eggs. According to some estimates, more than 8 million rural small and landless farmers/households raise livestock, making it an ideal sector for reducing rural poverty in the districts. Pakistan ranks among the countries with lowest livestock costs of production in the world.

Pakistan is endowed with a large livestock population of about 159 million heads that are well adapted to local environmental conditions (Table 10). It has good dairy breeds of buffalo and cattle. Many breeds of cattle, buffaloes, sheep, and goats have good meat and leather production potential as well. The poultry sector has also shown excellent growth over the last four decades.

Table 10: Number of Heads of Livestock, 2006/07–2008/09 (millions)

Species	2006/07	2007/08	2008/09
Goats	55.2	56.7	58.3
Cattle	30.7	31.8	33.0
Buffalo	28.2	29.0	29.9
Sheep	26.8	27.1	27.4
Asses	4.3	4.4	4.5
Camels	0.9	1.0	1.0
Horses	0.3	0.3	0.4
Mules	0.2	0.2	0.2
Total	**146.6**	**150.5**	**154.7**

Source: Ministry of Livestock and Dairy Development

The numbers for each type of livestock species have remained fairly consistent over the past three years. Goats account for about 36 percent of the total number of livestock raised at the farm and household levels, followed by cattle (21 percent), buffalo (19 percent), and sheep (17 percent). Households in virtually all of the priority districts raise livestock of different types.

Pakistan is the 4th-largest milk producer in the world, with annual production of 33 billion liters. Revenues from milk production exceed those of the wheat and cotton production combined. Almost all of the milk produced is consumed within Pakistan.

An estimated 30–35 million people nationwide raise livestock, which generates up to 40 percent of their income. Dairy alone contributes 60 percent–95 percent of total returns from livestock products on most farms, with the remainder coming from cattle sales and sales of other products. For many poor farmers in Pakistan, the value of their livestock exceeds the income generated from milk and meat. Cattle also serve as a store of wealth and a key source of energy for other farm activities. They can represent 10 percent–50 percent of farm assets.

Because meat is too expensive for many of the poor in Pakistan, dairy is the main source of animal protein. Annual per capita consumption of dairy products is estimated at 150 liters, with more than 70 percent of all milk produced consumed in rural areas. In urban areas, where studies have been completed, more than 80 percent of milk is consumed by children, making dairy a key source of nutrition and a critical determinant of the health of the population.

Buffalo dairy herds generate 62 percent of the total volume of milk produced in Pakistan (Table 11). The preference for buffalo milk can be attributed to its high fat (up to 7 percent) content. Milk from cows accounts for 34 percent of milk for human consumption, with almost all of the rest coming from buffalo.

Table 11: Dairy Production, 2006/07–2008/09

Production/Species	2006/07	2007/08	2008/09
Cow	13,913	14,437	14,982
Buffalo	25,465	26,231	27,028
Sheep	35	35	36
Goat	682	700	719
Camel	777	787	798
Total milk production (thousand tons)	**40,872**	**42,191**	**43,562**
Cow	11,130	11,550	11,985
Buffalo	20,372	20,991	21,622
Sheep	35	35	36
Goat	682	700	719
Camel	777	787	798
Milk for human consumption (thousand tons)	**32,996**	**64,064**	**35,160**
Eggs (millions)	11,197	10,711	11,258

Source: Ministry of Livestock and Dairy Development

Meat is the second-largest sector, after milk, in Pakistan's agriculture sector. Pakistan produced 2.5 million tons of meat in 2008/09 (Table 12). Domestic demand is growing at almost 6 percent a year, and supply is growing at 1.8 percent. Meat production and distribution are almost totally in the informal sector, with the exception of certain niche industries, such as goat, mutton, and beef casings in Multan, which has a number of relatively modern facilities and quality control systems.[6]

Table 12: Meat Production, 2006/07–2008/09 (thousand tons)

Item	2006/07	2007/08	2008/09
Beef	1,498	1,549	1,601
Poultry	554	601	652
Mutton	566	578	590
Total	**2,618**	**2,727**	**2,515**

Source: Ministry of Livestock and Dairy Development

[6] SMEDA Meat Sector Report

INDUSTRY AND MARKET STRUCTURE

Livestock raising and breeding and the dairy sector are largely informal and unorganized, based mostly at the household level throughout the rural and peri-urban populations of the country. In some districts, such as Bahawalpur and Multan, there are larger farms, but they are few in number.

DOMESTIC DEMAND AND POTENTIAL

Although production of milk has increased over the last several years, there is a gap between milk consumption and production. The lack of adequate processing and chilling plants and a poor distribution system in Pakistan's hot climate limits supply. Despite a large population of livestock, Pakistan spends $40 million annually on the import of formula milk—more than any country in the world.

EXPORTS AND EXPORT POTENTIAL

Pakistan exports live animals to Afghanistan from Buner, Multan, and other districts. Live cows, buffalo, sheep, and goats are also exported to Iran, where there is a shortage of meat, and the Gulf States.

Cattle Crossing Indus River

Almost the entire meat industry is unregulated, slaughterhouses are unsanitary, and spoiled and diseased meat regularly enters the market. These conditions make it impossible for Pakistan to export meat. An exception is meat casings in Multan, which has implemented quality standards and is exporting to various markets.

SUPPORTING ENVIRONMENT

Several government initiatives are in place to improve cross-breeding of various species and improve the health of herds through vaccination. However, major improvements are required to improve animal health, elevate the sanitary conditions of livestock markets, and protect breeding stocks. In Karachi 100 percent of survey respondents said that government support of the sector was unsatisfactory. As noted in a presentation by the Department for International Development to the Punjab Chief Minister in June 2009, "The failure to adequately develop the livestock sector rests on a combination of financial and governance issues." The DFID report notes that governance is hampered by the lack of technical capacity and appropriate regulations:

> *the province has been slow to create collection centers for milk for delivery to urban areas, to set up marketing chains, to conduct adequate research into the improvement of breeds, to move towards market-determined prices that would provide incentives for the growth of the sector, to set standards for health and quality (both of animals and of output), and to develop public-private partnerships for the development of this very large and potentially very profitable sector.*

The Punjab Economic Report points out that the provincial Livestock Department spends more than half its budget on livestock breeding farms. It recommends that this activity be transferred to the private sector in order to allow the Livestock Department to focus on pedigree registration systems, other regulatory functions, and capacity building.

SUPPORT SERVICES

The livestock departments are relied upon but their capacities are seriously stretched so they do what they can. Some, such as those in Larkana, would be more effective if they were able to provide services nearer to the local communities. Grading of milk and livestock products is essential, but is not done. Training is urgently required to deal with disease outbreaks, proper and timely vaccination, record maintenance, and feed management. Some NGOs have been able to step in to provide training to households about better livestock management.

The firms surveyed have a long list of supporting services they would like to receive from government and private associations. At the top of the list are market research and a system of quality standards (Table 13).

Table 13: Support Services Required in Dairy and Meat Processing

Support service	Percentage of respondents
Market research	73.3
Quality/standards	60.0
Lower tax rates	33.3
Lower input prices	26.7
Lower utility prices	26.7
Marketing/branding	13.3
Tax Preparation/Legal Services	13.3
Identification of opportunities	6.7
Feasibility studies	6.7
Networking/information	6.7
Services to Improve Productivity	6.7

Source: FIRMS survey in Karachi

In Karachi only 20 percent of industry representatives reported belonging to the Karachi Dairy Farmer Association. Fifty-three percent belong to the Karachi Chamber of Commerce. The Dairy Farm Association in Sukkur provides market information on trends and help on day-to-day issues. In Larkana, the Dairy Association is informal and the view of the focus group was that one of their highest priorities is to reorganize and strengthen the association.

RECOMMENDATIONS

The private sector and government need to work in concert to make the needed improvements in this key sector. Solutions are needed to provide more and better veterinary facilities at the village level. The dairy sector requires a milk grading, collection, and storage systems and services. The private sector would greatly benefit from upgrading their farm management practices and learning what is required in order to export.

Small in-house dairy set up in Sukkur

The 2006 Strategic Plan for the Pakistan Dairy Industry prepared by the Pakistan Dairy Strategic Working Group under the auspices of PISDAC–

USAID Pakistan focuses on institutional strengthening. This need remains. Appropriate food standards and regulations (including a pasteurization law) are needed, so that a basic legal framework is in place.

The government should also consider:

- Directing more resources to the livestock departments, so that they can provide better and more training for livestock holders, help them to deal with disease outbreaks, and get their livestock on vaccination programs.
- Supporting applied research and using this information for recommending on-farm changes and building technical capacity.[7]
- Supporting community organizations responsible for coordinating, organizing, and ensuring micro-credit, skills training, and other private services.[8]
- Identifying and supporting entrepreneurial activities at the village level, which could fill in the gaps, where modern capacity is limited.[9]
- Revising and implementing food quality safety standards and pasteurization laws.[10]
- Supporting the breeding of higher yield cattle.

[7] "The White Revolution - Dhoodh Darya, White Paper on Pakistan's Dairy Sector", Pakistan Dairy Development Company, June 2006
[8] "Pakistan Food and Agriculture Project: Report to USAID/Pakistan", USAID, March 2009
[9] "Pakistan Food and Agriculture Project: Report to USAID/Pakistan", USAID, March 2009
[10] "The White Revolution - Dhoodh Darya, White Paper on Pakistan's Dairy Sector", Pakistan Dairy Development Company, June 2006

EDUCATIONAL SERVICES

Educational services emerged as the 17th-ranked sector in the assessment of sectors in Pakistan. Peshawar, Karachi, and, to a limited extent, Charsada show significant officially recorded private sector activity in secondary education or training. There is likely more widespread unofficial (unrecorded) activity among other priority districts that was not captured in the survey. The prominence of the sector reflects its high employment potential, especially for women. The forward and backward educational links within the district are strong (output destination ranks 1st and input source ranks 7th). There is also strong demand. In Quetta, for example, a focus group of 16 business leaders ranked educational services as the number one sector in terms of demand and employment potential.

Educational services provide one of the strongest direct (measurable) and spillover domestic linkages within a given locality. The sector provides direct employment of teachers, administrators, support staff, and service providers to institutions, and it improves skills, which in turn increases productivity, quality, and competitiveness in industry and agriculture. Not surprisingly, the same Quetta business group that ranked educational services as the top sector listed the lack of skilled and trained manpower as one of the top five issues in the district.

The government has made education a top priority with its Education for All (EFA) plan. EFA aims to improve access to and the quality of primary education, as well as to spur sectorwide growth, by increasing enrollment in public schools, removing urban-rural and male-female imbalances, reforming the curriculum, providing demand-driven education, and encouraging private sector participation.[11]

INDUSTRY AND MARKET STRUCTURE

Education is publicly funded in Pakistan, but the multitude of challenges in the system has allowed the private sector to thrive.[12] Public schools are increasingly perceived as lacking academic standards. The system continues to suffer from a variety of problems, including the shortage of skilled teachers, teacher absenteeism, and failure to meet targeted goals. As a result, Pakistan is seeing a surge in private schools. Since the mid-1990s, small and inexpensive private schools have been sprouting up in the poorer countryside, charging relatively affordable tuition. About one-third of Pakistan's 33 million students attend private schools. Private schools tend to outperform public schools academically, but standards are generally low across the board.[13]

There are 202,249 public and private schools in Pakistan (elementary, secondary, and higher-secondary level), 76 percent of which are public schools. The vast majority of students in rural schools attend public schools,[14] but this is changing, as private schools become ever more affordable to middle- and even low-income groups.[15] Buner, for example, has witnessed a mushrooming of private education institutions. It is easy to find one to two private primary to high schools (to grade 10) in most of the bigger villages of the district.[16]

[11] "Education Reform in Pakistan," CRS Report for Congress, December 24 2004.
[12] "Education Reform in Pakistan," CRS Report for Congress, December 24 2004.
[13] "Private Schools Get More Popular in Pakistan," San Francisco Chronicle, November 14, 2009.
[14] "Education Sector Reforms: Chapter 2," Ministry of Education, Government of Pakistan, 2004.
[15] "Education Sector Reforms: Chapter 2," Ministry of Education, Government of Pakistan, 2004.
[16] FIRMS focus group discussion in Buner.

Fees for private schools vary widely but respond in predictable ways to measured school inputs. Parents can consequently easily infer quality variations across schools by comparing prices.[17] There are some exceptions, however. The fee for rural private schools in Pakistan has been reduced to less than $0.10 a day, as private schools are increasingly employing local, female, and moderately educated teachers who have limited alternative opportunities outside the village.[18] According to the Quetta focus group, demand for educational services is also growing because parents and Pakistani society in general are becoming more supportive of girls' education and employment. As a result, more girls and women are seeking admission into schools at all levels. Some focus group members indicated that it is economic pressure that is making parents rethink traditional attitudes about education for girls (educated women are more easily employed and earn higher salaries).

EXPORTS AND IMPORTS

As conflict in Afghanistan continues, more Afghan youths are entering Pakistan seeking better living conditions, including better education.[19] According to the 2007 Registration, 87 percent have either no education (70.3 percent) or only informal education (12.0 percent secular, 4.6 percent religious). Current policy allows Afghans to live, work, and attend schools in Pakistan. The education of girls among this population remains a challenge, but efforts are being made to improve their access, by, for example, offering classes taught by all-female staffs and evening classes for girls only.

More than 10,000 Pakistani students a year travel overseas to study. Many more students who are unable to pay for an education overseas seek private institutions that are affiliated with universities abroad, because these schools tend to offer education that meets international standards.[20]

INVESTMENT

Pakistan spends 2.4 percent of its GDP on education.[21] The financial resources needed to meet EFA targets—including primary education, adult literacy, and early education for 13 years—are estimated at $14.5 billion. Total resources are $9.4 billion, leaving a financial gap of about $5.1 billion. The government proposes financing the gap with strong public-private partnerships.[22] Investment incentives include the granting of free land for construction of school buildings; the provision of concessional financing for establishing rural schools; and the exemption from custom duties and other taxes on imports of education equipment and materials.

EMPLOYMENT AND WORKFORCE DEVELOPMENT

Pakistan's public educational institutions, including colleges and universities, employ more than 650,000 teachers, of which more than half are primary school teachers (Table 14).[23] There is an acute shortage of teachers at all levels, as illustrated by teacher/student ratios of 1:21 in 2008, according to data from the Pakistan Bureau of Statistics. In some places, such as Sindh province,

[17] "The Ride of Private Schooling in Pakistan: Catering to the Urban Elite or Educating the Rural Poor?" The World Bank and Harvard University, March 21, 2002.
[18] "A Dime a Day: The Possibilities and Limits of Private Schooling in Pakistan," World Bank Policy Research Working Paper No. 4066, November 10, 2006.
[19] Foreign students studying in Pakistan show up as exported services and Pakistani students studying outside of Pakistan show up as imported services.
[20] "Pakistan Country Profile: Health Development Situation," World Health Organization, April 2006.
[21] "Country Assistance Plan – Pakistan: Assessment of Socio-Environmental Performance," Asian Development Bank, 2009.
[22] "Financing of Education in Pakistan: An Estimation of Required and Available Resources to Achieve EFA Goals," Ministry of Education and UNESCO, Government of Pakistan, May 2003.
[23] "Status of Teachers in Pakistan," World Teachers' Day, UNESCO, October 5, 2003.

classrooms have more than 80 students, and this figure sometimes exceeds 100. The shortage of teachers means that many bear heavy workloads and have to teach multiple grades simultaneously.

Table 14: Number of Teachers, by Level of Education (Public and Private, 2005-06)

Level	Number of Teachers
Primary	440,568
Middle	310,753
High	362,188
Higher Secondary	58,884
Inter Colleges	10,541
Degree Colleges	20,568
Total	**1,206,907**

Source: Ministry of Education, Pakistan Education Statistics 2005–06

The education sector employs more women than any other sector. The percentage of female teachers is nevertheless low in publicly funded schools (36.5 percent)(Table 15). The low ratio is partially explained by the male-female ratio in primary schools (only 35 percent of all primary school students are female).[24]

Table 15: Number of Male and Female Teachers, by Level of Education (Public and Private, 2005-06)

Level	Male Teachers	Female Teachers	Percent of Female Teachers
Primary	242,479	198,089	44.9%
Middle	109,158	201,595	64.8%
High	164,789	197,399	54.5%
Higher Secondary	29,976	28,908	49.9%
Inter-Colleges	5,490	5,051	47.9%
Degree Colleges	10,083	10,485	60.0%
Total	**562,430**	**644,477**	**53.4%**

Source: Ministry of Education, Pakistan Education Statistics 2005–06

Teacher training at the federal level is the responsibility of the Curriculum Wing of the Ministry of Education. Training of primary school teachers in government schools occurs in three ways: through Government Colleges and Elementary Education (CGETs), through the distance education program of the Allama Iqbal Open University, and through teacher training courses administered in high schools. Upon completion of the one-year training program, graduates receive the Primary Teaching Certificate (PTC). Other than this, teacher training is deemed a provincial responsibility. Every province has an education extension center, where in-service training is held. The aim is to provide one training session to each teacher at least once every five

[24] "Status of Teachers in Pakistan," *World Teachers' Day,* UNESCO, 2003.

years. In practice, applicants to most provincial teacher training institutes outnumber the spaces. Private institutions are consequently starting to fill this gap.[25]

SUPPORTING ENVIRONMENT

According to a 2003 UNESCO study, nontransparent appointment of teachers, poor management and evaluation practices, the frequent transfer of teachers for political reasons, high student-teacher ratios (particularly in urban schools), and corruption in connection with retirements and pension payments have restrained sector development in recent years.[26]

Private schools are able to function only where they can hire teachers with a certain demographic profile (typically local, female, and moderately educated) in order to keep salary costs low. Private schools are constrained in rural areas because they can be established only in villages in which there is a pool of women with secondary education. So far, few private schools are able to provide secondary education in rural areas, because of the lack of the supply of potential teachers with the required skills and educational levels.[27]

SUPPORT SERVICES

The Teacher Consortium of Pakistan (TCOP) provides consultative services for developing strategic approaches and programs. The Pakistan Women Teacher's Council (a subsidiary of TCOP) brings female teachers together to confront issues and problems they face in the workplace. The Pakistan Association for Research in Education (PARE) was established by the Aga Khan University–Institute for Educational Development. It aims to promote a culture of educational research in Pakistan and enhance the impact of educational research on policy and practice. The Professional Teacher Association Network (PTAN), also founded by Aga Khan University–Institute for Educational Development, consists of nine voluntary associations that support the professional development of teachers and head teachers.

RECOMMENDATIONS

As private education expands and because it varies, there is a growing need for systems that provide information and quality control.

- There are business opportunities to provide comprehensive and regular information, even rankings, on the quality of private education institutions to promote consumer awareness.
- Private educational services need to provide quality control, including development of monitoring and evaluation activities. They would also benefit from establishing organizations that would help them share information on educational practices, curriculums, etc.[28]
- Higher education institutions should emphasize: (a) quality improvement of teaching; (b) complete academic reviews of departments, programs, and faculties; (c) incentives for outstanding faculty members (outcome dependent); (d) mechanisms for regular review and continuous improvement of curriculum; (e) assessment mechanism for student learning; and (f) tracking of progress.

[25] "Education Statistics Capacity-Building Programme to Support the Islamic Republic of Pakistan", The UNESCO Institute for Statistics, The National Technical Committee on Educational Statistics Capacity-Building and the Ministry of Education Wing (Government of Pakistan), 2005.
[26] "Status of Teachers in Pakistan," *World Teachers' Day,* UNESCO, October 5, 2003.
[27] "A Dime a Day: The Possibilities and Limits of Private Schooling in Pakistan," World Bank Policy Research Working Paper No. 4066, November 10, 2006.
[28] "Countries: AKDN in Pakistan", Aga Khan Development Network website.

The government should consider the following:

- Using the private sector to broaden access, improve quality, enhance relevance of education, as well as alleviate the burden on public institutions.[29]
- Improving textbook development and examination/assessment toward enhancing student learning and the classroom environment.
- Upgrading the qualifications of current teachers and developing a comprehensive program for teacher training. Focus should be placed on developing national standards for accreditation and improving coordination among teacher training institutions.[30]
- Increasing access to schools by rehabilitating inadequate and damaged school facilities and building new schools to ensure increases in enrollment.

[29] "A Dime a Day: The Possibilities and Limits of Private Schooling in Pakistan," World Bank Policy Research Working Paper No. 4066, November 10, 2006.
[30] "Fact Sheet: Partnership for Education", United States Agency for International Development, July 2009.

FISHERIES

The fishing industry ranks 9th overall in the sector assessment.[31] It ranks high in terms of market potential, ranking 7th in both revealed comparative advantage and export potential. It also has strong backward and forward linkages (ranking 7th), as reflected in its input source rank (10th). The fisheries and processing sector also offers an opportunity to address socioeconomic concerns, because of its strong potential to employ both women (ranked 8th) and youth (ranked 11th).

INDUSTRY AND MARKET STRUCTURE

The seafood sector covers upstream fishing and harvesting of fish and other seafood as well as the downstream activities of processing, trading, and retailing. Pakistan's main commercial varieties of seafood include some 350 types of fish; 15 species of shrimp; 12 species of squid, cuttlefish, and octopus; and 5 species of lobster. Most downstream activities, especially export-oriented activities, are based in Karachi, but there are significant clusters of upstream and downstream activity in the inland waters of the districts of Charsada, Larkana, and Sukkur (Table 16.).

Table 16: Districts in which Fisheries were identified as a Best Prospect

Priority Districts	Secondary Districts
Charsada	Dera Ghazi Khan
Karachi	Dera Izmail Khan
Larkana	Jacobabad
Sukkur	Rajanpur
	Shikarpur
	Thatta

Source: FIRMS Focus Group Inputs from Priority Districts

Pakistan's inland water resources consist of rivers, canals, water-logged depressions (ponds), and reservoirs. Inland fisheries resources extend over 4.3 million hectares. Six large reservoirs were created in the past four decades through the construction of dams and barrages.

Production by the seafood sector grew 4.2 percent between 2005/06 and 2006/07 (Table 17). Inland fish farming has grown dramatically over the last two decades, particularly in NWFP and Sindh.[32]

Table 17: Marine and Inland Seafood Production 2005/06–2006/07 (tons)

Type of production	2005/06	2006/07
Marine	425,000	381,000
Inland	179,900	230,000
Total	604,900	611,000

Source: Joint World Bank UNIDO Report on Pakistan's Agro-Based Exports and SPS Compliance

[31] Except where otherwise indicated, the information in this section is from the Joint World Bank UNIDO Report, *Pakistan's Agro-Based Exports and Sanitary and Phyto-Sanitary (SPS) Compliance,2006*.
[32] FIRMS Draft Karachi 1 report.

The seafood sector is competitive and not dominated by any monopoly suppliers or buyers. Major input materials required by firms—ice, iceboxes, cartons—are locally available (a few inputs, such as polybags and nylon, are imported). Suppliers face no restrictions in obtaining input materials or choosing suppliers. The Karachi survey indicates that suppliers are satisfied with the availability of warehouse services, cold storage, and transportation options. However, in the rural districts, there is a need for cold storage and improved transportation as demand and supply grows.

The value-added of this sector varies greatly depending on the type of activity. The value-added for the upstream fisheries sector ranges from 12 percent to 19.5 percent. In downstream activities, such as trading and retailing, it is about 45 percent.[33]

DOMESTIC DEMAND AND POTENTIAL

Per capita consumption of fish in Pakistan was about 1.95 kilograms in 2005[34] Domestic demand for fish is expected to grow rapidly, as a result of high population growth, increases in real per capita income, increases in the price of meat, and the introduction of locally manufactured value-added seafood-based products.[35] In certain districts, such as Charsada, Larkana, and Sukkur, demand is already high. In fact, it appears to be outstripping supply in Charsada and Sukkur.

EXPORTS AND EXPORT POTENTIAL

The seafood sector is a major source of export earnings and Karachi dominates the sectors as a major port and the country's fishing and processing center. From the 1990s through 2002–03, exports fluctuated between $66 million and $100 million. They rose to $153 million in 2003–04 but declined to $133 million in 2007 (Table 18). Exports of fresh, chilled, and frozen fish, shrimp, and prawns account for more than 75 percent of exports from Pakistan's fisheries sector (Table 13). Until recently, the European Union and Japan were the two largest export markets for Pakistan seafood. However, in January 2007, the EU banned fish imports because the industry in Pakistan did not meet EU quality and process standards. In 2007 the major buying countries were China, Thailand, the United Arab Emirates, Belgium, Malaysia, Japan, Hong Kong (China), Saudi Arabia, the Republic of Korea, and Sri Lanka.

Table 18: Exports of Seafood, 2007

Product	Exports (US$ millions)	Percent of total
Live fish	0.04	0
Fish, fresh or chilled, excluding fish fillet	8.64	7
Fish, frozen, excluding fish fillet	67.94	52
Fish fillets and other fish meat	1.32	1
Fish, dried, salted or in brine	11.32	9
Crustaceans, whether in shell or not	30.34	23
Mollusks, whether in shell or not	11.79	9
Total	**131.39**	**101%**

Source: UN COMTRADE database.
Note: Figures do not add to 100 percent because of rounding.

[33] FIRMS Information Collection Matrices
[34] WB/UNIDO report
[35] Karachi Chamber of Commerce

World demand for fish imports has risen notably in recent years, growing at an annual rate of 11 percent between 2002 and 2008[36]. Demand is likely to continue to rise, given the growing demand in China and the trend away from meat consumption in a number of Western countries.

Pakistan has exploited these growing trends in some major products but not others (Table 19). Fresh shrimp and prawn exports declined 14 percent over this period, during which international demand rose 13 percent. But exports of mackerel, Pakistan's main seafood export, grew 51 percent between 2002 and 2007, outpacing the global increase in demand. Frozen seafood grew even more rapidly, with exports rising by 123 percent over the same period. Pakistan also expanded its market share in a number of other categories, including crabs, sole, yellow-fin tuna, and other fish and crustacean varieties. Though exports are starting from a very small base in most of these categories, the rapid expansion of world demand signals a market opportunity for Pakistan.

Table 19: Seafood Exports and Global Import Growth, 2002–07 (millions of dollars)

Code	Description	Exports 2007 (US $ millions)	Export growth 2002–07 (percentage)	Global import demand growth 2002–07 (percentage)
03	Fish and crustaceans, mollusks, and other	133.9	6.2	36.5
030374	Mackerel	30.5	53.0	11.2
030379	Other	25.2	9.1	19.2
030613	Shrimp and prawns	20.4	-14.0	13.8
030624	Crabs	9.2	63.2	8.7
030749	Other (mollusks)	6.9	-0.7	9.5
030269	Other (fillets)	6.8	30.4	10.2
030229	Other (fillets)	6.0	66.2	14.4
030559	Other (dried)	5.7	-16.0	15.6
030623	Shrimp and prawns	3.4	123.3	20.9
030614	Crabs	3.1	26.1	24.7
030420	Frozen fillets	2.5	-0.1	14.0
030799	Other	2.4	45.8	24.3
030333	Sole	1.4	31.6	16.7
030319	Other	1.4	127.9	11.2
030339	Other	1.1	11.4	13.2
030741	Live, fresh, or chilled mollusks	0.9	136.0	13.1
030342	Yellowfin tuna	0.7	95.6	10.2
030329	Other	0.7	-16.5	17.9
030621	Rock lobster and other sea crawfish	0.7	96.8	16.0

Source: UN COMTRADE database

Pakistan exports mostly unprocessed and semiprocessed fish. The processing segment has a revealed comparative advantage (RCA) of 1.5, indicating a comparative advantage, which can

[36] UN Comtrade Database

provide the basis for further expansion and diversification. A 2006 World Bank/UNIDO report also identifies several opportunities for diversification through byproduct production. One is chitin and chitinosis products, which are derived from the shells of shrimp and crab and used in fishmeal. Various types of feed, such as highly vitaminized food supplements, fish protein concentrates, fish flour, and fish leather, also offer the potential for diversification.

The sector has experienced a number of problems with food safety and sanitary compliance in destination markets, particularly the European Union. Few Pakistani postharvest operations or processing plants comply with Hazard Analysis and Critical Control Point (HACCP) and Good Manufacturing Practice (GMP) requirements. Outdated machinery, the inability of processing units to maintain required temperatures, and other processing problems are the main hurdles to meeting food standards for export. Failure to meet these standards has caused exports to the European Union to drop.

When asked why they believed sales were growing or declining, survey respondents in Karachi provided a variety of responses (Table 20). Noncompliance with import market standards of the European Union was not cited as a key issue, although 10 percent of respondents cited poor infrastructure as a reason for a decline in sales.

Table 20: Perceived Reasons Why Seafood Exports Are Growing or Declining

Reasons for Growing	%	Reasons for Declining	%
Quality of products	30	High storage and transportation cost	40
Fast delivery	30	High cost of inputs	30
Increase in demand	30	Security and political condition	20
India's production decrease	10	Economic crisis	20
Best price	10	Taxation and regulatory issues	10
		Poor infrastructure	10

Source: FIRMS survey of Karachi fisheries industry

INVESTMENT

There is virtually no foreign investment in this sector. Opportunities exist in Karachi, but there is limited domestic investment. Small investments are being made in the priority districts primarily in fish hatcheries, fish farms, and small fish ponds.

EMPLOYMENT AND WORKFORCE DEVELOPMENT

Pakistan's fisheries sector provides direct employment to about 379,000 fishers, who operate from about 12,000 boats. Another 400,000 people are employed in ancillary industries, such as ice-making, packaging, and distribution, that are closely tied to the seafood-processing industry.

Owners and employees of fish centers in Charsada

Karachi dominates the sector, with about 300,000 fishers and 36 processing units. Other districts also have sizable fisheries sectors. In Larkana about 3,000 people, including 600 youth, work in the upstream fisheries sector. In

Charsada 850 people are involved in downstream sector activities, such as retailing. Sukkur employs 3,000 people, including 270 youth, mainly in fish trading and retail sales.[37] Fisheries is one of the largest employment sectors in Thatta, providing support for 35,000–40,000 people. Most activity is around Keenjhar Lake.

There are few formal training institutes for the sector. Training is provided primarily by firms via on-the-job training. Twenty percent of the respondents in the Karachi survey reported using the Marine Fisheries Department for training; 10 percent reported using the Harbor Society. In Thatta the Chilya Fish Training Center provides training services. Other districts, such as Dera Ghazi Kahn, are developing the industry without good knowledge of water quality needs, testing, and other sanitary and safety requirements. Training and extension services would help professionalize the industry and engage more women.

Women are employed as skilled and unskilled labor in the sector. Almost half of survey respondents indicated that they could attract more women workers if they offered convenient working hours, transportation, and a more women-friendly work environment. In rural districts, women are not employed in this sector, but focus group participants believed there was high potential for involving them given training and investment in more modern cleaning, packing, and processing facilities.

Youth account for a substantial share of the workforce in the seafood industry. In Jacobabad youth account for 80 percent of those employed in the sector. They operate the fish hatchery, 60 fish farms, and businesses involved in the marketing and transportation of fish.

SUPPORTING ENVIRONMENT

Solving the issues related to lifting the export ban to the European Union (EU) has been a priority of the industry and government. However, supply chain shortcomings also threaten the industry. At the harvesting level, the main problems related to regulation of the industry in Karachi include overfishing, degradation of the Indus Delta, and other threats to marine resources. A focus group discussion in Karachi pointed out that a stock assessment is urgently required (none has been conducted in the past 20 years). The Karachi focus group expressed dismay that the government does not provide research and development support and that no national efforts are made to market Pakistani seafood products abroad. Outside Karachi districts needs diagnostic laboratories, equipment, and expertise for testing water quality and diagnosing and treating fish disease.

SUPPORTING INFRASTRUCTURE

Karachi is the primary port of export; Gwadar port is under development. Together the two ports provide the industry with market access to both Asia and the Gulf region.

Eighty percent of surveyed firms reported unreliable electricity. In September 2009, respondents reported losing an average of 18 percent of working hours and using diesel generators an average of four hours a day, at twice the cost of electricity. Most respondents rated the quality of piped water, gas, and telephones as good, with 10 percent reporting poor access to piped water and the telephone. All firms interviewed indicated that access to credit was not a constraint.

[37] FIRMS Information Collection Matrices

SUPPORT SERVICES

The Sardaryab Fish Union of Charsada appears to be quite active with 150 members. It provides its members with information on inputs, helps consolidate the buying of inputs at discounted prices, and has been an effective advocate on issues affecting the industry in the district and province. Sukkur also appears to have an active association with 1000 members and also provides needed services to its members.

Among survey respondents in Karachi, 40 percent indicated an association with the Marine Fisheries Department, 30 percent with the Chamber of Commerce, and 10 percent with the Trade Development Authority. Equal numbers of respondents (40 percent) indicated that the quality of government services was good and poor. There are no industry-focused associations based in Karachi, despite issues that require industry-wide advocacy. The firms surveyed have a long list of requirement for supporting services from government, private associations, and other service providers (Table 21).

Table 21: Support Services Needed In the Fishing Sector

Service	Percentage of respondents
Marketing/branding	90
Market research	60
Removal of ban on export to European Union	40
Identification of opportunities	30
Cheap electricity	30
Reduction of sales tax and income tax	20
Quality/standards	10
Taxation/legal	10
Export rebate	10

Source: FIRMS survey in Karachi

RECOMMENDATIONS

The Karachi focus group deplored the current state of the sector and called for its revival. Investment is needed to upgrade the sector. The low scores in value-added and output per employee indicate the lack of and potential for processing facilities and for investments and improvements to raise productivity in the sector.

The Competitiveness Support Fund's "Action Plan for Fish Quality and Value Adding at Karachi Fisheries Harbour" details a number of needed improvements.[38] The recommendations for the government by the Karachi focus group included the following:

- Continue to work with the industry and the EU to remove the ban on exports.
- Craft and adopt a comprehensive national fisheries policy, formulated with the participation of all stakeholders, based mainly on the optimum utilization of fisheries resources, achieved through the adoption of the latest research and technology for sustainable production.

[38] "Action Plan for Fish Quality and Value Adding at Karachi Fisheries Harbour," Competitiveness Support Fund and USAID, January 2007.

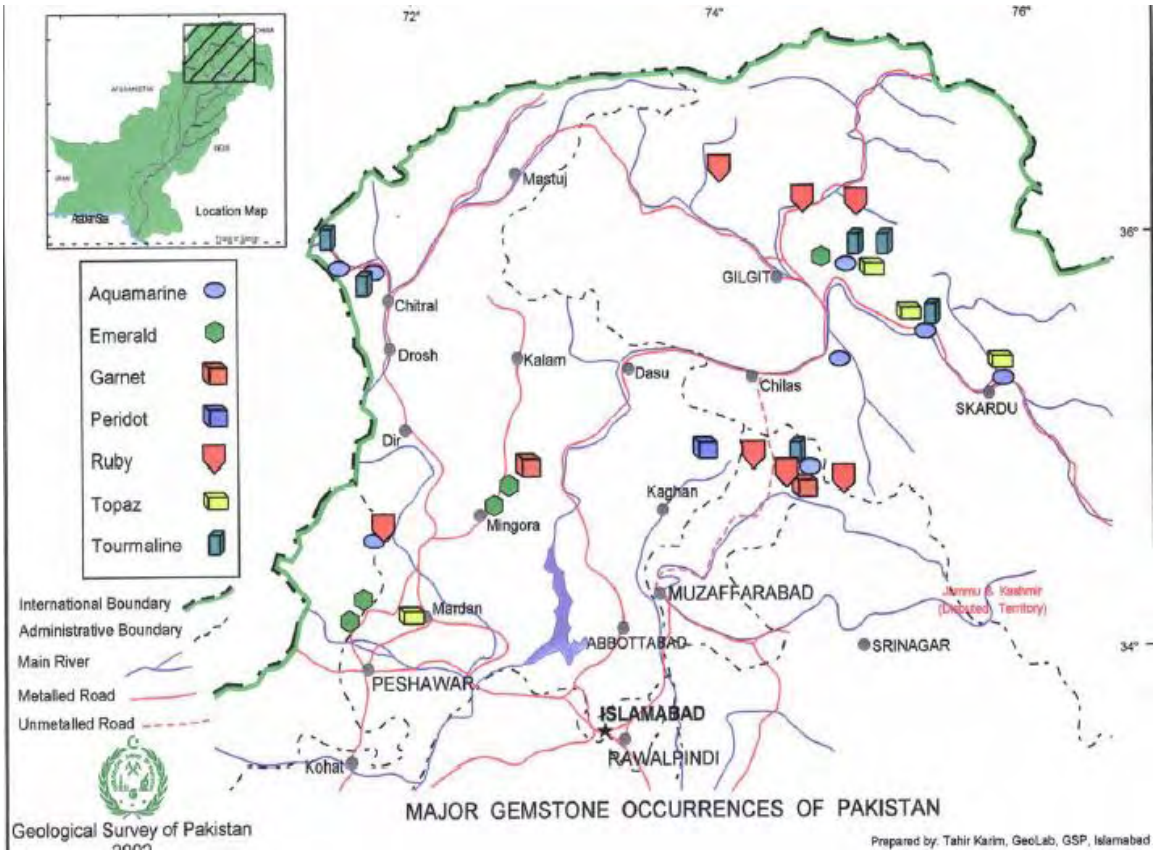
- Establish an independent board, with equal participation by the public and private sectors that answers directly to the federal government.
- Restore and improve the food supply chain for the sector.
- Outside Karachi, provide extension services that provide knowledge and training as well as diagnostic and testing labs. Cooperate with the associations who have been filling in the gap.

GEMS AND JEWELRY

The gems and jewelry sector ranks 16th in scenario 1 of the sector assessment and 9th in scenario 2 (which weights the presence in the priority districts more heavily). The sector is important in Peshawar, Karachi, Bahawalpur, and Larkana. It has many forward and backward linkages to the national economy, and it generates youth employment, relatively high output per employee, and relatively high value-added.

Although it has high potential, the sector is currently experiencing difficulties as a result of the deterioration of law and order in the northern areas of Pakistan, where the raw material is extracted. As a result of disruptions to the supply chain, 80 percent of firms in Peshawar are experiencing losses[39].

Figure 1: Map of Gemstone Deposits



INDUSTRY AND MARKET STRUCTURE

Gems are mined mostly in the NWFP, Balochistan, and Gilgit-Balistan. Karachi is the main commercial hub for the sector. All leading manufacturers and exporters are based in the Saddar

[39] FIRMS Surveys and Focus Group Discussion in Karachi

market, which controls the business throughout Pakistan. In Peshawar the industry is concentrated in Namak Mandi Peshawar City. All gems mined in the region are brought into this market and distributed to the domestic market and for export purposes. Other important centers are Lahore, Rawalpindi, and Hyderabad.

Gem Dealer in Peshawar

More than 30 major cities and nearly 300 smaller cities/towns produce and trade jewelry in Pakistan. In addition, there are almost 45,000 villages in which jewelers operate shops and manufacturing and selling units to meet the demand of the rural population. Most manufacturing is concentrated in small family workshops employing two to four people. Statistics are not available regarding the total number of gem and jewelry firms by district, but primary research indicates that there are about 7000 firms in Karachi (2000 in costume jewelry), 440 firms in Peshawar, 220 firms in Larkana, and 500 firms in Bahawalpur. The number of gem and jewelry firms is large, but very few produce and export branded jewelry that is recognized by foreign buyers.

The value-added in the sector averages about 65 percent ranging from 43 percent in Peshawar to 88 percent in Larkana among the highest in the priority districts studied. Although most inputs gold and silver, tools, and machinery come from overseas suppliers, the workmanship and local materials contribute to a significant share of the value-added.

Modern technology and skills would increase the value added dramatically. The bulk of jewelry in Pakistan is produced manually by skilled workers via the lost-wax casting process. This process has two limitations: jewelry cannot be produced in bulk, and wastage is high. In contrast, production of machined jewelry enables high volume production with much less wastage. The wastage in hand casting is as high as 15 percent; it can be reduced to about 5 percent by modern machines. Access to long-term financing is still an issue although the sector received official industry status in 2006.

DOMESTIC DEMAND AND POTENTIAL

Jewelry manufacturing has taken place in Pakistan since the Mughal period: wearing jewelry is still considered a sign of power and influence in Pakistan, and local demand is strong. In fact, Pakistan uses more than 170 tons of gold a year, making it the 8th-largest consumer of gold in the world. The Pakistani market for gems and jewelry is estimated at $1.2 billion.

EXPORTS AND EXPORT POTENTIAL

Official records indicate that Pakistan's exports of gems and jewelry rose from $36 million in 2002 to $82 million in 2007, a 14 percent annual increase, but anecdotal evidence suggests that the real value could be much higher, given unreported exports from smuggling activities. A large percentage of unofficial exports would explain the low relative comparative advantage (RCA of 0.21) and low export prospects index (EPI of 0.143) index values for the sector.

Pakistan exports ethnic designs and handmade jewelry to a wide range of countries. Its main export customers have been the Gulf countries, the United States, and the European Union (Table 22). Statistics from 2007 are shown as they are more representative of the Pakistan overseas market than statistics from 2008. Over the past decade, exports of machine-made jewelry also increased. The bulk of exports, however, are lower value-added uncut precious stones.

Table 22: Gem and Jewelry Exports, by Destination, 2007 (US$ Millions)

Importer	Trade Value
United Arab Emirates	23.3
United States	15.2
European Union	9.0
United Kingdom	4.3
Germany	3.3
Canada	2.6
Thailand	1.4
Hong Kong, China	1.3
Italy	0.8
Japan	0.4
Turkey	0.3

Source: UN Comtrade data

Although the volume of gem and jewelry exports from Pakistan is not high compared with the total global industry of $90 billion and is much lower than that of India, Pakistan's main regional competitor the sector has great export potential. The government recognizes the importance of the sector and has pledged to increase the exports of gems and jewelry to $1.5 billion by 2017.

In export markets, the sector has positioned itself mainly as a producer and seller of rough uncut stones, which are sent to Europe, the United States, India, and Thailand for cutting and polishing. As a result, Pakistan loses the opportunity to add value to the end product. Part of the reason why cutting and polishing are done abroad is that Pakistani firms are not in compliance with international standards such as ISO or other industry-specific bodies. There is not a single hallmarking/assaying[40] facility or gem certification laboratory in Pakistan that can conducts the appraisals required by customers in major export markets, although the Pakistan Gems and Jewelry Development Company (PGDC) reports on its website that it is about to introduce hallmarking in Pakistan. India has 11 hallmarking centers and 3 certification labs.[41] In Pakistan representatives of the buyer come to the vendor, examine the stones, and approve the goods for export. Buyers from Europe, the United States, India, and Thailand usually buy the rough stones and go elsewhere to have them cut and polished to international standards.

[40] Process by which a legally appointed official stamps a precious metal to denote precious metal contained in a piece.
[41] "Gems and Jewelry Sector Development Strategy." A presentation by Gems and Jewelry Strategic Working Group (SWOG), July 2005

INVESTMENT

In 2007 the Ministry of Industries, Production and Special Initiatives allocated $23 million to the PGJDC to improve the sector.[42] Industry players also need to invest in gem-cutting equipment and modern casting machinery. Without such machinery, revenues are far below what they could be because of the low quality of finishing. Focus group participants in Peshawar, Bahawalpur, and Karachi pointed out that the high duties and taxes on machinery imports are a disincentive to invest.

EMPLOYMENT AND WORKFORCE DEVELOPMENT

About 500,000 residents of Karachi work in the sector, in about 5,000 small businesses. Another 2,000 small factories produce costume jewelry in Karachi.[43] Peshawar employs about 3,160 people, including more than 600 youth. Another 800 people, including more than 300 youth, work in the sector in Larkana.

Focus group participants indicated that youth have a "brilliant career in this sector" with some basic technical training and education and even better prospects with more advanced training. Cutting and polishing skills add value to the products and increase exports. Jewelry design, particularly the ability to incorporate more modern designs for export markets, is also in great demand. Key educational institutions that are relevant to the sector are the Gems and Gemological Institute of Peshawar, the University of Engineering and Technology Gems Development Center in Peshawar, Beacon House National University, and the Pakistan Institute of Fashion Design.

MARKET RESTRICTIONS

Focus group participants from this industry identified several key constraints:

- Costs are high, because of the relatively high duty rates on raw materials and finished goods as well as high sales taxes.
- Lack of capital is a huge constraint to modernizing the industry. In Peshawar 56 percent of respondents consider lack of capital to be their greatest constraint.
- Customs clearing at airports is cumbersome.
- Visas to the United Kingdom and the United States are difficult to obtain.
- Rudimentary and unscientific mining practices, which result in significant wastage at the extraction stage, prevent the industry from penetrating the international market for gemstones.[44]
- Most cutting and polishing shops are in congested areas of narrow streets and lack adequate processing facilities, making the work environment unappealing, particularly for women and youth.
- Labor is in short supply, and skills are deficient.
- Design capabilities are limited, modern manufacturing technology and techniques are lacking, and international branding is poor.[45]
- The policy framework is not conducive to sector development.[46]

[42] Directory of Industrial Establishments NWFP, 2007
[43] UNIDO Gems/Jewelry Sector Diagnostic Study and FIRMS
[44] "Strategic Plan for Pakistan's Gems and Jewelry Industry," *Pakistan Initiative for Strategic Development and Competitiveness Project USAID*
[45] "Strategic Plan for Pakistan's Gems and Jewelry Industry," *Pakistan Initiative for Strategic Development and Competitiveness Project USAID*
[46] "Strategic Plan for Pakistan's Gems and Jewelry Industry," *Pakistan Initiative for Strategic Development and Competitiveness Project USAID*

The focus group discussion session and the survey in Karachi identified the following sector-specific constraints:

- Cutthroat competition
- Power outages
- Rudimentary methods
- Lack of new technology
- Costly labor
- High rate of utility charges and tax regulations
- High barriers to entry
- Use of traditional designs and lack of innovations
- Lack of benefits from training institutes
- Lack of exports
- Lack of affiliation with an international gold organization
- Lack of hallmarking and assaying
- Smuggling
- Underinvoicing
- Deteriorating law and order situation
- Lukewarm response of association
- Illiteracy

SUPPORTING ENVIRONMENT

In 2006 the government established the Pakistan Gems and Jewelry Development Company (PGJDC) to provide assistance that would give the sector a "mine to market" set of capabilities and enhanced international competitiveness. The PGJDC's mandate is to develop and staff better facilities, through technological improvements and capacity building/training for craftspeople. Efforts are being made to improve the quality of gem cutting and polishing in Peshawar. Focused international marketing initiatives are also being pursued to help the sector understand more fully the requirements of overseas buyers.[47]

SUPPORTING INFRASTRUCTURE

The industry suffers tremendously from power outages, which reduce productivity, the ability to deliver on time, and cost competitiveness. In Peshawar power outages of 3–4 hours cut up to 24 hours out of the workweek. According to the focus group, some of the work is covered by overtime, but the losses are still huge, because not all workers are willing to work overtime. Companies in other districts reported even higher losses as a result of power outages.

SUPPORTING SERVICES

The key trade associations in the sector are the All Pakistan Commercial Exporters Association of Rough and Unpolished Stones and the All Pakistan Gem Merchants and Jewellers Association. The Pakistan Gems and Jewelry Development Company (PGJDC) has been very active in the sector;

[47] "Strategic Plan for Pakistan's Gems and Jewelry Industry," *Pakistan Initiative for Strategic Development and Competitiveness Project USAID*

together with the Sarhad Chamber of Commerce and Industry and the World Gold Council, it provides technical and marketing assistance to the industry. Other key government institutions are the Small and Medium Enterprise Development Authority (SMEDA), the Ministry of Industries, Production, and Special Initiatives, and the Trade Development Authority of Pakistan.

The Gems and Gemological Institute of Peshawar (GGIP), in Peshawar, is devoted to the study of gemology. It provides professional training for those planning to enter or already employed in gem and jewelry trade. In 2006, it signed a Memorandum of Understanding with the Asian Institute of Gemological Sciences (AIGS), in Bangkok, establishing a professional partnership.[48]

RECOMMENDATIONS

Sector improvements require efforts on the part of government as well as the sector's leading companies and other industry stakeholders as a whole--working together. The private sector needs to focus on upgrading their technologies and training, introducing new designs attractive to oversea buyers, as well as marketing and branding. Specific recommendations from the focus group discussion focused primarily on government actions, including the following:

- Supporting geological surveys to identify new deposits and quantify existing ones.
- Affiliating Pakistani gemological laboratories and certification facilities with international entities, and supporting efforts to help the industry meet international standards.
- Investing in workforce development and innovation capacity, by setting up specialized training institutes in the three key districts where this industry is located, and ensure that these institutes are marketed to and attract women students.
- Introducing a lending scheme with banks that supports investments to modernize mining, gem processing, and jewelry manufacturing.
- Reviewing the tax structure toward reducing taxes and duties on machinery imports.
- Cracking down on the smuggling and under-invoicing.
- Strengthening industry organizations and supporting infrastructure by developing an institutional platform to implement specific strategies.

[48] "USAID Assists Pakistan In Making Gemological Institute World-Class," *USAID Press Release 2006*

HORTICULTURE AND AGROPROCESSING

Horticulture and commodity crops (rice, wheat, cotton) account for 25 percent of Pakistan's GDP, employ 44 percent of the country's workforce, and contribute substantially to export earnings. Vegetable and fruit crops contributed 12 percent of Pakistan's agricultural GDP in 2003/04.

Pakistan has a rich and vast natural resource base, covering various ecological and climatic zones, making it possible to produce all types of food commodities. About 27 percent of Pakistan is currently under cultivation. Of this area, 80 percent is irrigated—one of the highest percentages in the world. The southern parts of Pakistan provide excellent conditions for growing mangoes, bananas, citrus, and other tropical fruits; the high mountain ranges in the north and northwest, which have extremely cold winters, provide good conditions for temperate fruits such as apples, apricots, and grapes.

Pakistan exported $263 million of fruit and vegetables in 2007, up from $106 million in 2002, an increase of 19.2 percent a year (Table 23). The growth rate far exceeded that of any manufacturing exports, including textiles, which grew at a rate of 9.3 percent during the same period.

Table 23: Fruit and Vegetable Exports, 2002 and 2007

		Exports (millions of dollars)		Growth (percent)
Code	Description	2002	2007	2002–07
0113	Growing of fruit, nuts, spices	87.4	221.3	20.4%
1513	Processing and preserving of fruit	11.1	22.0	14.7%
0112	Growing of vegetables	7.1	19.2	21.9%
	Total	**105.7**	**262.7**	**19.2%**

Source: UN COMTRADE database.
Note: Totals are not sum of components because of rounding.

FRUIT

Fruits, nuts, and spices ranks 6th in overall growth and employment prospects in priority districts, thanks to the large number of entities engaged in the industry and its strong relative comparative advantage (ranked 5th) and export prospects (ranked 4th). The product categories the priority districts produce and export—mangoes, honey, dates, spices, and guava—coincide with the top horticulture exports from Pakistan. The priority districts do not appear to export much directly, except for guava to Afghanistan from Larkana. Instead, fruits are sold to agents from another district, who exports the produce.

The fruit sector has tremendous potential in Pakistan. The climate is suitable for the commercial production of numerous temperate, subtropical, and tropical fruit crops. Adequate labor is available. Pakistan's large population and its proximity to rapidly developing world economies indicate significant potential for future market growth.

INDUSTRY AND MARKET STRUCTURE

The main crops are citrus and mango, which jointly account for about 55 percent of all cultivated fruit production (Table 24). Other key crops are dates, bananas, and apples, which together account for 17 percent of total fruit production. Although Pakistan is among the largest international producers of fruit (producing 6 million tons in 2004), the bulk of production is wasted, consumed on farm, or sold domestically.

Table 24: Production of Main Fruit Crops, By Region (Million ton)

Crop	Punjab	Sindh	NWFP	Balochistan	All Pakistan
Citrus	1,872	29	37	6	1,944
Mango	1,312	350	6	7	1,675
Dates	43	318	9	252	622
Banana	12	130	13	3	158
Apple	4	0	128	220	352
Other	954	118	320	495	1,887
All fruits	**4,197**	**945**	**513**	**983**	**6,638**

Source: Competitiveness Support Fund's Horticulture Action Plan: Background Paper July 2007

Fruit growing is prevalent throughout Pakistan, including in a number of priority districts, which specialize in certain fruits. Multan is known for its mango production, Sukkur for its dates and Larkana for its guava. About 75,000 acres of land in Multan is under mango cultivation, and the sector is growing, as new entrants are coming into the sector. In Larkana, 84 percent of fruit orchards are devoted to guava production.[49] Bannu and Charsada produce a mix of fruits, such as bananas, citrus, guava, loquat, plums, watermelons, persimmon, pears, and musk melons, but none is as prominent as mango is for Multan or dates for Sukkur. In Bahawalpur citrus and mango are the main fruit crops.[50]

Within many districts, there are distinct fruit clusters. Mango orchards are clustered along the bank of River Chenab. In Charsada the main center for fruit growing is Tangi. Although date fields are spread all over Sukkur, the heaviest concentration of date farms and markets is along the Indus River. Major centers of fruit production and markets in Lower Dir are Talash, Ziarat, Timergara, Rabat, Munda, and Samarbagh. Fruit cultivation in Peshawar takes place along the outskirts of Peshawar and extends toward

Fruit shop in Charsada

[49] Sindh Agriculture Statistics, 2007–2008

[50] Competitiveness Support Fund's Horticulture Action Plan: Background Paper July 2007, Joint World Bank UNIDO Report Pakistan's Agro-based Exports and SPS Compliance, and FIRMS Data Information Collection Matrices, Draft Reports, and Data Compilation Tool

Charsada, Nowshera, and Mardan; the main markets are along G.T Road.[51]

Large numbers of farmers grow citrus, dates, mango, and other fruit. There are seven major mango producers/farmers in Multan, along with thousands of small-scale farms. In Sukkur there are more than 250 date farms. In Bannu more than 300 farms grow dates, bananas, and guava; Lower Dir has 400 farms growing virtually the same crops as Bannu. In Larkana 444 farms are engaged in guava cultivation. Charsada has 100 farms that cultivate several different types of fruits.[52]

The market is highly competitive; no single or small group of buyers or sellers appears to dominate the market. The price of fertilizer is raised substantially during peak season, however.[53]

Value-added differs across fruit subsectors, because of different costs of inputs and prices sold in markets. Differences can highlight issues. For example, the value-added in Multan in the mango subsector is 41 percent; in Bahawalpur value-added is 48 percent for both mango and citrus. Value-added for dates in Sukkur is about 40 percent. Value-added for fruit crops in other districts is higher: 55 percent in Charsada, 68 percent in Larkana, 76 percent in Lower Dir, and 81 percent in Bannu.

Poor post-harvesting practices and lack of cold chain capabilities contribute to significant waste in Pakistan. In addition, by-products are not used. Most fruit is consumed within Pakistan, with exports generally shipped from points outside of the district of origin.[54]

EXPORTS AND EXPORT POTENTIAL

There are significant export market opportunities for Pakistani producers that can provide consistent supplies of high-quality fruit at competitive market prices. Currently, only a small percentage of fruit is exported: out of the 1.67 million metric tons of mangoes produced in Pakistan in 2005, for example, only about 80,000 metric tons (5 percent) were exported. However, Pakistani fruit exports have been increasing (see Table 20).

The global market for fresh fruit and value-added fruit products has been increasing as the world population grows and per capita income rises. At the same time, increasing competition from China, India, Iran, and other countries makes increasing exports difficult and threatens Pakistan's domestic fruit industry. China has increased its export volume of both apples and grapes to Pakistan and has taken over a significant share of the Sri Lanka, Bangladesh, and Nepal fruit export market that Pakistan once had.[55]

The rise in global imports has come about through both changes in the source of international demand and pure volume growth within existing destinations. The fact that the markets that are growing dramatically are nearby bodes well for Pakistan (Table 25). India has become the world's largest export destination, with $63 million in 2007, up from $13 million in 2002. The United Arab Emirates rose from being the world's 63rd largest importer in 2002 to the 3rd largest importer in 2007, with $31 million worth of imports. It is also becoming an important transshipment and processing hub for major agriculture produce. Recent anecdotal evidence suggests that it is

[51] FIRMS Information Data Collection Matrices and Draft Reports
[52] FIRMS Information Collection Matrices and District Draft Reports
[53] FIRMS Information Data Collection Matrices and Draft Reports
[54] FIRMS Information Data Collection Matrices and Draft Reports
[55] Pakistan Fruit Sector Analysis and Recommendations, David Picha, December 2006

leveraging its energy resources to transform itself into a manufacture and agriculture-processing hub, including a hub for fruit juices, as evidenced by the rise in the exports of these products to other Middle East and North African countries.

Table 25: Leading World Importers of Fruits, 2002 and 2007

Destination	2002 (million tons)	2007 (million tons)	Growth 2002–07 (percent)	Rank 2002	Rank 2007
India	13.3	63.5	36.6%	3	1
European Union	27.4	55.1	15.0%	1	2
United Arab Emirates	0.0	31.4	500.0%	63	3
United Kingdom	12.7	30.2	18.9%	5	4
Saudi Arabia	14.3	22.4	9.3%	2	5
Russian Federation	0.1	15.1	200.6%	41	6
United States	6.0	10.2	11.4%	7	7
Germany	8.0	9.0	2.4%	6	8
France	3.2	8.1	20.6%	11	9
Sri Lanka	4.0	7.7	14.3%	8	10
Kuwait	0.0	5.7	34.6%	64	11
Canada	3.5	4.9	7.3%	10	12
Switzerland	1.6	4.6	24.2%	17	13
Kazakhstan	0.0	4.0	210.7%	52	14
Bangladesh	1.3	3.8	23.6%	20	15
Oman	3.6	3.7	0.5%	9	16
Qatar	2.6	3.2	3.7%	13	17
Indonesia	13.2	2.9	-26.1%	4	18
Netherlands	2.2	2.9	5.1%	14	19
Ukraine	0.0	2.5	358.7%	57	20

Source: UN Comtrade Database

Mango is Pakistan's main export crop, despite that a small percentage of the fruit is exported. In 2008, out of the estimated 1.7-1.8 million metric tons produced, approximately 5 percent was exports and in 2009 a record volume of 132,000 metric tons or 7 percent of the crop was exported. The leading export market destinations for Pakistani mangoes are Dubai, the Gulf States and Saudi Arabia. These countries comprise nearly 80 percent of the total export volume.[56]

Pakistan exports dates to 23 markets, including but not limited to India, the United States, Canada, the United Kingdom, Germany, and Nepal. In 2007, 76 percent of Pakistani date exports went to India. The Indian market for Pakistan dates has been growing at a remarkable 28 percent per annum between 2002 and 2007, although Pakistan has not been keeping up with the growth in imports from India, losing market share for the past five years to imports from Iran and the Middle East.

[56] Mango Value Chain Development Strategy Final Report for FIRMS, David Picha, November 2009

Pakistan exports dates predominately in dried form. During 2008 it exported 95,699 tons of dried dates, with a value of almost $40 million[57]. Export of fresh dates was 2,645 tons, with a value of $136,000. Exports of fresh dates have been in decline as a direct result of the poorer quality of Pakistani dates relative to those produced in Tunisia, the Islamic Republic of Iran, and Israel.

Fresh Dates Being Dried in the Open in Sukkur

Fruit processing in Pakistan is limited and the grading, packaging, and labeling processes for the domestic market are rudimentary. Packaging is basic, usually in the form of basic wooden boxes for fruit or jute or hessian sacks for mangoes. In some cases, the sacks are reused and are extremely unhygienic. In some districts, including Lower Dir, there has been increased investment in the packaging of fruits, but much remains to be done throughout the country.

Sales of fresh produce suffer because there are no fully linked cold chain systems that can extend shelf life and enhance product freshness. Additionally, postharvest handling methods are poor, resulting in considerable losses (of up to 30 percent) and reduction in shelf life. The lack of suitable crop storage in production areas limits marketing options and discourages producers from linking with downstream markets.[58]

INVESTMENT

The difficulty in obtaining financing is seriously constraining investment in the sector and the ability to exploit export market opportunities. Quetta, for example, could increase its exports dramatically if more modern cold storage facilities were constructed. An investor in cold storage and former president of the Chamber of Commerce and Industry applied to banks to expand his operation, but they were reluctant to finance capital equipment. Guava growers in Larkana cited lack of investment financing as one of their key constraints.

Fruit farm in Tangi, Charsaa

EMPLOYMENT

Nearly 20,000 people in Sukkur work in the date sector, of which 52 percent are women. In Lower Dir 4,000 people, including 1,200 youth, are employed in fruit growing. In Larkana about 24,000 people work in the guava sector, of which 38 percent are youth.[59] Every district indicated significant potential for increasing employment of youth if fruit-processing facilities are established. Several districts indicated that there would also be

[57] UN COMTRADE

[58] Joint World Bank UNIDO Report Pakistan's Agro-based Exports and SPS Compliance and FIRMS Information Data Collection Matrices and Draft Reports.

[59] FIRMS Information Data Collection Matrices and Draft Reports

employment opportunities for women in processing facilities as well as in grading and packing once those processes become better established.

SUPPORTING ENVIRONMENT

Producers in all districts consider the lack of storage, particularly cold storage, and food-processing facilities to be a major constraint. In some districts, social and cultural constraints prevent women from working in the fields and limit the amount of available labor. In Bannu high taxes, the lack of pesticides and fertilizers, and the lack of water and irrigation negatively affect the sector. Bahawalpur faces water shortages, black market sales of fertilizers during the cultivation season, insufficient and expensive bank lending, labor shortages, a constant struggle with plant diseases, and farmers' lack of market knowledge. Survey respondents in Larkana pointed to high local taxes, in the form of a general sales tax on inputs, land rent, and water rates, as a major issue.

SUPPORTING INFRASTRUCTURE

Electricity outages create problems in the sector when farmers use tubewells for irrigation and cold storage units shut down. In Peshawar the fruit sector is heavily dependent on cold storage; farmers suffer large losses when outages occur. In Lower Dir, crops are not watered when the electricity shuts down, with an estimated loss of 20 percent–30 percent of their crops. The decrease in sales in 2008 compared with 2007 is partially attributed to this problem.

SUPPORTING SERVICES

Fruit crop growers in Pakistan need the help of public sector research institutions to overcome numerous production constraints that compromise the yield and quality of their crops. Budget and staff limitations mean that insufficient applied research is conducted at the national and provincial level to support the tree fruit sector. Mango quick decline threatens the fruit industry; a significant infusion of resources is needed to understand the pathology of and control the disease. The Shujaabad mango research station in Punjab Province lacks adequate funding and staff capable of addressing this industry-threatening problem.[60]

Other problems facing the sector that could be solved through support services include the following:

- Growers lack knowledge of the best cultivars, production methods, pest management, harvesting practices, and postharvest care.
- The fruit crops sector has a poor market information system. There is no transparency in the prices of fruit and processed products offered in different domestic markets in Pakistan.
- There are only a few fruit crop extension specialists at the provincial level. Most extension agents lack the training to be in-depth specialists. In Lower Dir, the Agriculture Extension Department serves only a limited number of large farms owned by influential growers, according to the focus group.
- There are no formal links between agriculture university research institutes and the provincial government extension programs. The linkage between applied research and extension is critical to strengthening the fruit crops sector.

[60] Pakistan Fruit Sector Analysis and Recommendations for PISDAC, David Picha, December 2006

The lack of organization and cohesiveness of the industry is also a serious constraint. Few producer or commodity organizations or industry associations offer training or represent the fruit crops sector on government policy matters, market development, or research-related activities. For years, fruits have been classified as minor crops within the Ministry of Agriculture and have not received the attention or support provided to the larger cash crops.

Better industry organization is needed to exploit market opportunities. Most fruit in Pakistan is produced by small-scale farmers on no more than a few hectares of land. Most single producers cannot supply large buyers with sufficient quantities to make them attractive suppliers. Large buyers do not have the staff to help them deal with many small farmers. By organizing and providing buyers with a single point of contact, organizations could provide small producers with access to supermarkets, hotels, and other large fruit purchasers. Being able to access the industry through growing organizations would also make it easier to provide information and training, introduce new technologies, secure credit, and obtain certifications and registrations.

RECOMMENDATIONS

Improving the quality of fruit produced in Pakistan requires an integrated approach that begins with the application of proper cultural practices during the growing season. The process includes appropriate postharvest care practices to maintain product quality during temporary storage and distribution to the market. Substantial technical assistance and training is needed in Pakistan at all stages:

- Growers must be provided with adequate knowledge of proper production practices, harvesting methods, postharvest care, and marketing skills through agricultural extension or other technical assistance service providers.
- Specialized training workshops should be conducted for agriculture extension agents, including on the use of field instrumentation to check pH, soil salinity, and potassium and nitrate content.
- More applied research by the public sector institutions and private entities is needed to overcome the constraints along the fruit crop value chain.[61]
- New crops and more modern cultivars should be introduced. Pakistan's climate is ideal for growing high-value vegetable crops. New crops and cultivars would expand export opportunities. For example, grapes are one of the leading fruit crops grown in Pakistan, but the industry is based on older seeded types with little export potential. Trial sites could be established for new varieties.
- Drip and micro-sprinkler irrigation should replace surface flooding, which is inefficient, results in soil compaction, and increases root rot disorders, including quick decline in mangoes. Demonstration plots should be established on both provincial government research farms and private fruit growers' land comparing the results between irrigation methods.
- Significant infrastructure investments are also needed in on-farm cooling equipment and cold storage capacity to extend market life and maintain the postharvest quality of perishable fruit crops over several months or more. There are no on-farm cold storage facilities for mangoes in Punjab Province, which produces 68 percent of national mango

[61] Pakistan Fruit Sector Analysis and Recommendations, David Picha, December 2006

production. There is only one older cold storage facility for apples in Balochistan Province, with a capacity of 300 tons.

- Fruit and vegetable growers need to establish stronger links with domestic, regional, and international buyers in order to obtain more profitable returns.
- Growers would also benefit from stronger associations that can bring growers together for volume purchases (at discounts) and sales, advocacy on issues, and training.
- Small-scale agro-processing operations should be established in the rural villages near fruit production areas. Doing so would strengthen the local economy and provide jobs to the local workforce. Such agro-processing facilities may include operations for fruit drying and the production of juice, concentrates, pulp, nectar, puree, paste, jams, jellies, preserves, vinegar, canned products, and frozen fruit.

The government should consider the following measures:

- Launch awareness campaigns to educate farmers on better techniques for growing, controlling disease, harvesting, packing, and preserving to enhance value in the market. Widespread training and technical assistance may not be feasible or affordable, but awareness campaigns would be a good start and have an immediate impact.
- Expand the extension services provided by the Agriculture Department, and deepen the knowledge of agents.
- Work with financial institutions to help them create savings and credit instruments that are attractive to farmers and take their cash flow into account.
- Consider investment incentives or public-private partnerships that establish "green" industrial parks outfitted for investors in food processing.
- Ensure an uninterrupted supply of fertilizers to prevent artificial shortages and inflated prices.

VEGETABLES

Vegetables rank 14th in the sector assessment, primarily thanks to the sector's presence in the priority districts: vegetables were reported in 10 of the priority districts covered. The subsector scored poorly in export dynamics (RCA index .06 and EPI .02) and moderately well in other key criteria, such as employment (ranking 8th). The subsector's low ranking in export dynamics is an anomaly, as survey respondents indicated that more than 20 percent of district produce was exported (to Afghanistan, the Middle East, and India)—a higher figure than official national estimates.

Vegetable Farm in Tangi, Charsada

Pakistan has the potential to produce a much wider range of vegetables than it currently grows. The country's main vegetable crops are cucumbers, onions, potatoes, tomatoes, peas, cabbage, cauliflower, carrots, red chilies, and okra.

SUBSECTOR AND MARKET STRUCTURE

Key cash vegetables crops such as potatoes and onions are grown mostly in Central Punjab and southeast NWFP. There are pockets of significant production of potatoes, onions, tomatoes, flowers, and cucumbers in Bahawalpur, Charsada, Larkana, Multan, and Peshawar. In Charsada vegetable growers are clustered in Tangi Tehsil. The hub of floriculture and vegetable farms in Peshawar is in Tranab, Hayatabad, and Bacho Khan Chowk. Onion production is concentrated in 21 districts, which account for more than 76 percent of total production. More than 50 percent of total production comes from seven districts (Hyderabad, Mirpurkhas, Sanghar, Swat, Mastung, Kalat, and Turbat), but production also takes places in some priority districts.

Production of potatoes rose from 1.9 million tons in 2002 to 2.5 million ton in 2007 (Table 26). Onion production rose from 1.4 million tons in 2002 to 2.0 million tons in 2006 before falling to 1.8 million tons in 2007.

Table 26: Production of Potatoes and 0nions, 2002/03–2006/07, (million tons)

Year	Potatoes	Onions
2002/03	1.946	1.428
2003/04	1.938	1.449
2004/05	2.025	1.765
2005/06	1.568	2.056
2006/07	2.582	1.816

Source: Agricultural Statistics Federal Bureau of Statistics

There are a large numbers of farms in districts with significant horticulture/vegetable sectors. The market is highly competitive, with many players; no single or group of producers controls the market.

The primary data collected indicate that the vegetable sector generates fairly high value-added. Larkana's vegetable farmers generate 67 percent value-added, followed by farmers in Peshawar (60 percent), Bahawalpur (48 percent), and Multan (45 percent). Peshawar's farmers export some of their produce to Afghanistan; the vegetable sector is a growing sector, in which many farmers wish to expand their activities.

Vegetable Market in Peshawar

Primary data also indicate that 252 farms are involved in vegetable production in Larkana and 400 farmers in Charsada grow potatoes, tomatoes, cabbage, okra, spinach, broccoli, sprouts, celery, and parsley. Flowers are an important horticulture item produced in Peshawar, where eight firms are involved in floraculture cultivation and marketing.

EXPORTS AND EXPORT POTENTIAL

Pakistan exported $36 million in vegetables, in 2007, which dropped to $31 million in 2008. Like fresh fruits, fresh vegetables are often sold at low prices because exporters are unable to provide adequate consistent quality of postharvest processes such as grading and packing. Value is also lost because of the lack of food-processing facilities, which causes Pakistan's vegetable farmers to lose value immediately at the postharvest stage.

Despite this situation, the prospects for Pakistan's vegetables exports are good, particularly if more high-value vegetable crops are introduced. Pakistan's share in the world market has risen steadily, since 1991. Revenues from exports of vegetables totaled $45 million in 2008[62]. Potential markets exist in Europe and the Middle East, but better post-harvesting and quality measures must be implemented if Pakistan is to penetrate them.

Potatoes and onions are the major fresh vegetables exported; okra, eggplant, cucumber, melons, and squash are not exported in any significant quantities. Export earnings have stagnated over the past four years, because Pakistan's traditional export markets for vegetables (the Middle East) have been buying from other countries that have improved their quality. Most Pakistani vegetables in the main Middle Eastern markets are sold in wholesale markets. Pakistani onions and potatoes are marketed through import agents in Sri Lanka, Indonesia, and Malaysia.

Pakistan has good potential to emerge as a strong player in regional and global vegetable markets and meeting the requirements for these markets would pay off. Pakistani growers receive an average 41 percent less for produce that is sold in the domestic market than what the same produce could fetch in international markets.

Growers have difficulties conforming to Good Agricultural Practices (GAP) and suffer from the absence of modern packing, grading and refrigerated transport facilities. Investments are needed to improve quality and enable growers to comply with the standards needed to enter into more lucrative but competitive markets, such as those in the European Union, Japan, and China.

INVESTMENT

The vegetable business is considered quite lucrative. Many farmers are looking for funding so that they can increase their purchases of crop protection chemicals, fertilizers, seeds, and other tools of production, which will enable them to increase cultivation and improve yields. The recent introduction of tunnel farming (greenhouses) has helped farmers understand the benefit of investing in needed equipment and growing vegetables in the off season, when demand in the market and profit margins are high. In Lower Dir, the Dir Area Support Program (DASP) program monitored the demand and price of vegetables throughout the year and then launched an awareness campaign to inform farmers of the benefits of growing out-of-season vegetables.

EMPLOYMENT AND WORKFORCE DEVELOPMENT

The sector employs a significant number of people, many in pockets in certain tehsils within a district. Primary research indicates that about 750 people are involved in the floriculture sector and 1,330 in the vegetable sector in Peshawar; about 1,260 people are employed in the sector in

[62] UN Comtrade Database

Larkana[63]. Across Pakistan, about 20 percent of the sector's employees are women, and another 20 percent are youth. Government and donor programs provide training, particularly on tunnel farming, but government support focuses mostly on fruits.

SUPPORTING ENVIRONMENT

Although the vegetable sector does not receive nearly the attention of the fruit sector, production and exports are growing, and Pakistan's fertile soil and climate give it a competitive advantage. In other words, there is tremendous potential. The sector suffers from most of the same issues as the fruit sector—lack of storage, particularly cold storage, and food-processing facilities. Farmers also complain of high taxes, the unavailability of pesticides and fertilizers, the lack of water and irrigation systems in some districts, and a lack of market knowledge.

SUPPORTING INFRASTRUCTURE

Electricity outages create problems in the sector when farmers use tubewells for irrigation and cold storage units shut down.

SUPPORT SERVICES

Like fruit farmers, vegetable growers need the help of public sector research institutions, including agriculture extension services, to overcome numerous production constraints that compromise the yield and quality of their crops. Tunnel farming is of great interest, but it requires technical assistance and training as well as access to financing. Helping farmers understand buyer requirements, in terms of quality, standards, packaging, etc. for export markets, would be a valuable service. In Charsada a FIRMS researcher witnessed dozens of laborer carefully collecting and packing vegetables in cartons for export to Europe. Once the owner of the farm understood the requirements and had the market contacts, he and several other nearby farms were able to adapt their methods of farming and harvesting to the export market.

RECOMMENDATIONS

See earlier Fruit write-up in this section.

[63] FIRMS Survey Data

INFORMATION TECHNOLOGY (IT)

The IT (software and hardware) sector is a very high-value-added sector that contributes directly to virtually all other sectors. Although the sector ranks fairly low in the various scenarios (because of its small size in most of the selected districts and low export penetration), the importance of the sector cannot be underestimated, given its spillover effects to other sectors of the economy, the potential for more than 1,000 enterprises operating in the country, and the sector's production of $2.8 billion a year of goods and services, $1.6 billion of which is exported. Its exports place Pakistan well ahead of other higher-profile countries, such as Vietnam and many countries in Eastern Europe.

Pakistan has immense opportunities to rapidly expand the IT industry and to progress up the value chain. The market for offshore services, including software development and business process outsourcing, is constrained not by demand but by the lack of suitable resources in off-shoring countries. In addition, only a small fraction of the potential market has been developed so far.

Two priority districts—Multan and Karachi—ranked IT as a main industry. The value-added of the IT services sector based in Multan is relatively low, representing just 10 percent–15 percent of output. The figure is 48 percent in Karachi, where a broader range of activities—including both software and hardware (mainly repair oriented) services—is provided.

Pakistan's IT sector has posted impressive gains in recent years. According to the Pakistan Software Export Board (PSEB), the sector generated about $2.8 billion in revenues in 2005/06. Total IT spending was about $1.4 billion that same year. (Table 27)

Table 27: Descriptive Statistics on the IT sector, 2005/06

Number of IT companies registered with PSEB	1,497
Number of foreign IT and telecommunication companies working in Pakistan	60
Industry size (sales) of services, software, hardware	$2.8 billion
IT and IT–enabled exports	$1.6 billion
Growth in exports over previous year	34%
Number of universities offering IT/Computer Science programs	110
Annual number of IT graduates	About 20,000
Number of IT professionals employed in Pakistan	110,000
Number of IT professionals engaged in export-oriented activities (software development/call centers, etc.)	More than 15,000
Space utilized in IT and software technology parks	Nine IT parks covering 68,285 square feet

Source: Pakistan Software Export Board website

INDUSTRY AND MARKET STRUCTURE

Pakistan has many IT firms, and the market is competitive in standard software development and services. The sector is rapidly gaining expertise in cutting-edge areas of the industry, such as animation, business process outsource, enterprise resource planning (ERP), and gaming. There are

viable enterprises in all of these product and service segments. By 2007 more than 100 Pakistani IT firms had secured ISO certification, and 7 firms had earned various levels of Capability Maturity Model Integration (CMMI) certification.[64] According to a report by the Pakistan Software Export Board (PSEB), the top five companies that have contributed the most to the IT sector are Nestsol Technologies, Ovex Technologies, TRG Private Ltd., Systems Private Ltd., and Elixir Technologies. These firms can be considered anchor firms.[65]

Pakistan's software industry comprises three main segments: product-focused packaged software, software/IT services, and software/IT consulting. Other products include enterprise resource ERP solutions and customized software applications for the textiles, banking, pharmaceutical, insurance, and financial sectors; engineering and design applications; e-commerce and e-business solutions; Customer Relationship Management (CRM) and call center packages; multimedia and training modules; medical and legal transcriptions; and data entry.

The IT sector is concentrated in the main urban areas of Pakistan (Islamabad, Karachi, Rawalpindi, Islamabad, and Lahore). There is also a sizable sector in Multan City, which serves as the regional hub for the IT–based industry in southern Punjab. Almost every computer user is familiar with Khan Plaza, the city's main computer hardware and accessories market. There are five major software houses in Multan (Table 28), which work on system design and support for international, government, and large industrial clients. Two of the software houses interviewed are exporting 70 percent–80 percent of their work, to North America, Canada, Spain, and Belgium. Multan City also has a large number of software shops/businesses that develop and sell programs for local needs. Although Lahore remains the preferred market for major software solutions, everyday personal computer (PC) needs are met by Khan Plaza and software shops in the city.

Table 28: Software Development Companies in Multan City

Company	Contact Information
Ebanyan Pakistan	Office No. 5, Al-Noor Plaza Shah Rukhn-e-Alam Colony, Multan Telephone: (61) 6777961
EduSoft System Solution	Bakhtawar Hall, Ist Floor, Khawar Center, Multan Cellphone: 0300-9635363
Nextbridge (Pvt) Ltd.	House No. 6, Block Z, 100 Feet Road, New Multan
Raffles (Pvt) Ltd.	Office No. 64, Ground Floor, Khan Plaza Multan Cantt Telephone: (61) 4580432
Softronix Regional Office Multan	Hassan Arcade, Multan Cantt Telephone: 4517307

Pakistan's computer hardware manufacturing activity is limited. Hardware components are readily available in large quantities and at low prices, but most of the manufacturing activity is confined to the assembly of PCs from imported parts and components. Many major international hardware players, including Philips, Hewlett Packard, Intel, and Samsung, have offices in Pakistan; others, including Acer and Dell, operate through distributors. Only a few local companies produce their

[64] PSEB
[65] PSEB

own branded hardware components (PC casings, for example, are built and designed around microprocessors from Intel and Advanced Micro Devices).[66]

DOMESTIC DEMAND AND POTENTIAL

Local demand for hardware has diminished because of the flood of inexpensive used computers and laptops into the market. The domestic software market is suffering because of the easy availability of pirated software, which limits sales and investment. Local software developers are now using techniques/devices to prevent copying of their products sold, but pirating remains an issue.

EXPORTS AND EXPORT POTENTIAL

Computer software accounted for the bulk (67 percent) of exports in 2009. Exports rose from $75 million in July 2007 to $103 million by April 2009, an increase of 18 percent (Table 29). Exports of other computer services also increased dramatically, rising from $16 million in July 2007 to more than $29 million in April 2009. Exports of hardware consultancy and hardware maintenance and repair services increased by 35 percent through 2008.

Table 29: Exports of IT Services, 2007 and 2009 (thousands of dollars)

Service	July 2007	April 2009
Computer software	74,915	102,801
Software consultancy	22,902	19,531
Other computer services	16,327	29,329
Hardware consultancy	772	1,596
Maintenance and repair service	143	279
Total	**115,059**	**153,536**

Source: State Bank of Pakistan 2009

INVESTMENT

Direct foreign investment in the IT sector was about $30 million in 2006. This figure should rise, as foreign investors plan to make imminent investments in the sector. For example, Japanese investors have earmarked $100 million for Karachi's IT Park. The government also plans to build IT parks in major cities and has invested billions of dollars to produce IT experts. Both efforts are spurring investment.[67]

EMPLOYMENT AND WORKFORCE DEVELOPMENT

In 2007, about 75,000 people worked in IT. This figure includes both people working in the IT industry itself and those working in IT departments in public and private organizations. Of this total, about 13,000 people were engaged in export-oriented software development.

Now more than 110 universities in Pakistan offer IT programs. They produce 20,000 IT graduates a year.[68] In response to a survey question regarding the preferred institutions for hiring labor, 44

[66] *"Human Capital in Pakistan: An IT Industry Review,"* Pakistan Software Export Board, August 20007
[67] Pakistan Investment Policy http://www.pakboi.gov.pk/pdf/IT%20&%20Telecom.pdf
[68] Pakistan Investment Policy, http://www.pakboi.gov.pk/pdf/IT%20&%20Telecom.pdf

percent of firms in Karachi reported FAST and Sir Syed University; 33 percent preferred NED University of Technology. Other institutions cited include the Computer Institute and the IT Institute. Multan has several universities, 40–50 large institutes, and 150–200 small institutes offering IT courses of all types. In Multan the industry hires graduates of Punjab College and Baha-ud-Din Zakriya University.

SUPPORTING ENVIRONMENT

The government has been proactively developing the IT sector, starting with establishment of the Pakistan Software Export Board in 1995. The government provides tax exemptions to firms establishing low-rent IT parks and allows foreign investors to repatriate 100 percent of profits from IT companies through 2016. Key constraints are the lack of capital to finance development and start-up expenses, the lack of strategic corporate planning and focus, and the inability to produce quality products and services on a consistent basis.[69]

SUPPORTING INFRASTRUCTURE

The quality of electricity is poor -78 percent of firms report it to be of modest or poor quality. Respondents to the survey in September 2009 indicated that 16 percent of working hours are lost to power failure. Firms use five hours of diesel generator a day, at a cost of PKR 1,125 per hour—28 percent more than the rate charged by the electric utility. In Multan during the same period about 22 percent of working hours a week were being lost to load shedding.

The two main impediments the industry faces are the unfavorable international perception of Pakistan and the need to ramp up skilled human resources. Fundamental and rapid improvements must be made in both areas to take full advantage of the potential of the IT sector.

SUPPORT SERVICES

The main trade associations are the Pakistan Computer Bureau, the Computer Society of Pakistan, Pakistan Software House Association, and the Internet Service Providers Association of Pakistan. Among firms surveyed in Karachi, 33 percent are members of the Karachi Chamber of Commerce, 11 percent have an association with the Pakistan Software Export Board, and 50 percent of firms have no association with government associations.

Survey respondents in Karachi reported that the government is providing support in the areas of research and development and a common facility center, which about 25 percent were aware of. Ten percent said that the government is also providing support in staff training and product development. Forty-four percent of firms rated government services and performance average, and 11 percent reported support services to be poor. Among firms that belong to private associations, 22 percent reported that the association provided information on potential markets and competitors in markets; 11 percent said that these associations are also helpful in providing information on national or international industry trends and new technologies and issues. Firms surveyed identified a variety of support services that would be beneficial (Table 30).

[69] Pakistan Investment Policy, http://www.pakboi.gov.pk/pdf/IT%20&%20Telecom.pdf

Table 30: IT Support Services Identified as Beneficial

Supporting services	Percent of respondents
Human resources–related	78
Marketing/branding	33
Networking/information	33
Quality/standards	22
Market research	22
Increased export and infrastructure facilities	11
Tax reduction	11

Source: FIRMS Survey in Karachi

Firms surveyed in Karachi report a variety of constraints (Table 31). They also identify many positive aspects of the market, first among them the availability of skilled labor.

Table 31: Constraints and Advantages of the IT Sector

Constraints	Percent of respondents	Advantages	Percent of respondents
Restriction in goods movement	60	Availability/productivity of skilled labor	78
Electricity	44	Availability of cheap labor availability	33
Sales tax rate/income tax rate	33	Easy access to market	22
Taxes and duties on finished goods	22	Income tax concessions	11
Income tax and customs issues	22	Sales tax exemption	11
Labor shortage	22	Education	11
Utility rates (other than electricity)	20	Good infrastructure	11
Lack of capital	11	Matching grants for technical assistance and business development services	11
Local taxes	11	Software exports	11
Market competition	11		
Restricted market access	11		
Skills deficiency/capacity issues	11		
Electricity rates	10		

Source: FIRMS Survey in Karachi

RECOMMENDATIONS

There are a number of initiatives that could be undertaken by the private sector:

- Establish an industry-wide association (s) to organize the industry, support it on policy issues, work with educational institutions to revise curriculums to meet the needs of the industry, and organize and host trade events.

- Emphasize the development and improvement of quality-related as well as "soft" skills in the industry. [70]
- Use the association to address the international perceptions of the industry, working with the Pakistani government.
- Use the association and other local opportunities to educate other industry sectors of the value and cost savings that results from incorporating IT into their operations.
- Use the association to help members network, keep up on trends in the global industry, learn about better management and quality control practices.[71]
- Develop more contacts with potential international clients.
- Increase expenditure on research and development.[72]

The PSEB and the government should consider:

- Working with the IT sector to develop a strategy and implement measures to counter the negative international image of Pakistan.[73]
- Developing a program of fiscal and non-fiscal incentives to nurture, develop, and promote the use of IT in industries and increase their efficiency and productivity.
- Investing more in IT training institutions.
- Following through on some of PSEB's big plans, such as setting up IT parks. One would be particularly welcome in Multan.

In Multan, the focus group believed the local government could be more supportive by:

- Openly supporting and talking about the IT industry and its benefit for the district;
- Providing symbolic support such as special rates for the IT industry for billboards;
- Developing more supporting district level policies;
- Allocating space to set up an IT park;
- Using local IT companies to help them upgrade their processes and procedures;
- Supporting the organization of IT fairs in Multan and other tehsils to reach out to the public, students, and companies in the region.
- Developing programs to encourage more male and female graduates to acquire IT-related skills and enter the profession.

[70] "Driving Forward the Pakistani Software and IT-related Services Industry", Pakistan Software Export Board, December 2007
[71] "Pakistan's Software Industry Best Practices and Strategic Challenges", Pakistan Software Export Board, February 2005
[72] "Driving Forward the Pakistani Software and IT-related Services Industry", Pakistan Software Export Board, December 2007
[73] "Driving Forward the Pakistani Software and IT-related Services Industry", Pakistan Software Export Board, December 2007

LEATHER

Leather tanning and leather products ranks 14th. The sector has strong forward and backward linkages within Pakistan as might be expected given the prominence and presence of livestock throughout the country. It also has a reasonable ranking for export-related measures, ranking 11th in both Revealed Comparative Advantage and Economic Prospect Index.

Small shoe factory in Charsada

The leather industry contributes about 5 percent to manufacturing output.[74] Hides and skins from livestock have numerous applications within the leather goods industry in Pakistan. Hides are thick and used in a wide range of products, including footwear, handbags, jackets, belts, accessories, and wallets. Most hides come from cattle and buffalo (Table 32) with the rest from goats. The industry has recently faced a shortage of raw material as a result of increased exports of live animals.

Table 32: Production of Hides, Skin, Wool, and Hair, 2006/07–2008/09

Item	2006/07	2007/08	2008/09
Hides (pieces)	**11,800**	**12,199**	**12,612**
Buffalo (pieces)	2,892	6,070	6,255
Cattle (pieces)	5,813	6,032	6,260
Camels (pieces)	95	96	97
Skins (pieces)	**44,325**	**45,325**	**45,325**
Goatskin (pieces)	21,283	21,860	22,452
Fancy skin (pieces)	12,910	13,215	13,526
Sheepskin (pieces)	10,131	10,251	10,373
Kid skin (pieces)	9,901	10,170	10,445
Lambskin (pieces)	3,009	3,045	3,081
Wool (thousand tons)	**40.57**	**41.05**	**41.54**
Hair (thousand tons)	**20.85**	**21.41**	**21.99**

Source: Ministry of Livestock and Dairy Development

[74] Nisha Taneja, ICRIER 2001

INDUSTRY AND MARKET STRUCTURE

The industry includes tanneries and factories for making leather garments, footwear, and gloves (Table 33). Pakistan is well known for producing high-quality finished leather, garments (sports jackets), and gloves (working and industrial). Given its potential, however, production of leather goods (garments, gloves, handbags, suitcases, key chains, belts, etc.) and footwear is very small. Installed capacity for leather garments is about 15 million pieces per year. Sialkot accounts for nearly 59 percent of total output. Karachi has an installed capacity of about 5 million pieces a year, and Lahore has installed capacity of about 1 million pieces. The total installed capacity for leather glove production was 89 million in 2008. It is centered in Sialkot with some capacity in Karachi.

Shoe shop in Charsada

Pakistan produced about 205 million pairs of footwear in 2007/2008. Production is concentrated in Lahore, where 306 units are located (59 percent of the total number of units in Pakistan). The second-largest footwear producer is Karachi, where about 8 percent of the total number of units are located. Various types of leather goods are also produced in Bannu, Charsada (footwear), Multan, and Sukkur.

Table 33: Capacity of Leather Manufacturers, by Commodity 2007/08 (unit millions)

Commodities	Number of Major Industrial Units	Total Capacity
Tanneries	770	90 square meters
Leather garments/apparel	355	15.39 pieces
Footwear	523	205 pairs
Leather gloves	347	89.12 pairs

Source: Industrial Informal Network of IDS Consultants

There are more than 2,500 tanneries and footwear manufacturing units in Pakistan, located mainly in Karachi, Lahore, Sialkot, and Kasur. The largest concentration of tanneries for finished leather is in Kasur, where 223 units (about 28 percent of the total) are located. The second-largest concentration of tanneries is found in Sialkot, which has 210 units (25 percent of the total). Karachi has 174 units (22 percent of the total number of units). Kasur and Karachi specialize in processing raw hides and skins into finished leather. Table 34 lists the cities in which leather tanning units where located in 2007–08.

Table 34: Number of Leather Tanning Units, by City, 2007/08 (unit millions)

Cities	Units	Cities	Units
Kasur	223	Gujrat	2
Sialkot	210	Hyderabad	2
Karachi	174	Dadu	2
Gujranwala	51	Sukkur	2
Multan	43	Bahawalpur	1
Shekhupura	28	Charsada	1
Lahore	15	Jehlum	1
Sahiwal	8	Khushab	1
Faisalabad	7	Mirpur	1
Peshawar	6	Sawabi	1
Sargodha	5	**Total**	**770**

Source: Industrial Informal Network of IDS Consultants

EXPORTS AND EXPORT POTENTIAL

The value of exports of all leather products in 2008 totaled $995 million (garments, gloves, tanned goods, and leather products).[75] Export revenues from the sale of livestock products (live animals, meat, skins, and hides) were about $650 million in 2004 (11 percent of Pakistan's total export earnings). The official major destinations were China and the European Union for tanning and dressing of leather (Table 33). The European Union also imports a significant quantity of footwear and luggage.

The finished leather goods industry is struggling to compete with low-cost producers from China and India. Tanneries that supply pickled and wet-blue semi-finished materials are selling them to overseas customers, who are willing to pay higher prices than domestic leather goods manufacturers, who are suffering as a result.[76]

Large informal exports of hides and skins to India and the informal export of livestock and meat to Afghanistan are missing in official statistics. The most recent estimates suggest that informal trade between India and Pakistan is three times higher than officially recorded trade.[77]

[75] "Exports from Pakistan- Final Statistics", Trade Development Authority of Pakistan Website
[76] Chapter 2: Agriculture of Economic Survey 2008-2009, PISDAC – USAID Pakistan, JE Austin Associates, Inc.
[77] Nisha Taneja, ICRIER 2001

Table 35: Selected Leather Exports, by Destination, 2006 (Millions of dollars)

Product/destination	Trade value
Tanning and dressing of leather	
Hong Kong (China)	92.7
European Union	87.8
China	61.8
Italy	43.5
Korea, Rep. of	26.1
Germany	12.5
Japan	12.0
Spain	9.5
Vietnam	9.4
South Africa	8.2
Turkey	8.0
France	7.2
Manufacture of footwear	
European Union	49.0
Germany	10.6
France	9.9
United Kingdom	9.1
Saudi Arabia	6.1
Manufacture of luggage, handbags and accessories	
European Union	12.5
United States	8.7
Other animal farming	
Saudi Arabia	8.4

Source: UN Comtrade Database

Pakistan exports live animals to Afghanistan from Buner, Multan, and other districts. Live cows, buffalo, sheep, and goats are also exported to Iran and the Gulf States, where there is a shortage of meat. As a result of increased exports of live animals, the leather industry is facing a shortage of raw material.

In the year ending June 2008, the leather goods sector recorded exports of $1.25 billion, an increase of 21 percent over the previous year. Of these exports, 57 percent were garments, 23 percent tanned leather, and 9 percent footwear.

EMPLOYMENT AND WORKFORCE DEVELOPMENT

The industry provides direct employment to more than 200,000 people. Over 20,000 people are employed in producing leather garments alone (Table 36). Another 12,000 are employed in making leather gloves—11,000 in Sialkot alone. Respondents to the survey in Karachi, indicated that their most preferred institution for hiring labor (70 percent of respondents), was the National Institute of Leather Technology. Ten percent of respondents preferred the University of Karachi while twenty percent firms indicated no preference for any institution. Twenty percent of respondents stated that there is in-house training and 80 percent firms have on-the-job training facilities.

Table 36: Leather Garment Production, by City, 2007/08

Cities	Number of businesses	Installed capacity (million pieces)	Employment
Karachi	130	4.64	8,201
Gujranwala	3	0.10	190
Islamabad	3	0.04	61
Kasur	3	0.05	54
Lahore	21	1.14	1,306
Multan	2	0.06	70
Rawalpindi	4	0.08	109
Sahiwal	2	0.22	300
Sialkot	186	9.05	10,789
Mirpur	1	0.01	70
Total	**355**	**15.39**	**21,150**

Source: Industrial Informal Network of IDS Consultants

SUPPORTING ENVIRONMENT

Leather tanning is one of the world's most polluting manufacturing activities; it has one of the highest toxic intensity per unit of output. Converting hides into leather requires some 130 chemicals and 50–150 liters of water per kilogram of converted leather. Effluents discharged from tanneries are voluminous and contain heavy sediment load, including toxic metallic compounds, chemicals, biologically oxidizable materials, and large quantities of putrefying suspended matter. If not properly controlled, tanneries can directly contaminate prime agriculture land. Most of the tanneries in Punjab and NWFP are located in residential neighborhoods. They thus have the potential to directly threaten the health of the urban population. Some tanneries, such as those in Multan, have been moved, at great cost to the owners.

Leather Tannery

SUPPORTING INFRASTRUCTURE

The cost of production, especially utilities and taxes, is higher in Pakistan than in China or India, according to the Karachi focus group, making Pakistan's products uncompetitive in international markets. Seventy percent of survey respondents from Karachi ranked the availability of electricity as modest to poor; they estimated that 34 percent of working hours are lost to power failure in September 2009. Firms use diesel generators four hours day, at a cost that is more than 40 percent higher than that charged by the public utility.

SUPPORT SERVICES

Half of respondents in Karachi were members of the Karachi Chamber of Commerce; 80 percent of respondents recognized a need for a "proper" association. Only 10 percent belonged to the Pakistan Leather Association & Garment Manufacturer & Exporter Association (Table 37).

Table 37: Participation in Government and Private Associations by Leather Producers

Association	Percentage of respondents
Government associations	
Karachi Chamber of Commerce	50
Pakistan Trade Association	10
Pakistan Leather Association & Garment Manufacturer & Exporter Association	10
No government agency	40
Private associations	
No proper private association	80
Korangi Association of Trade and Industry	20

Source: FIRMS Survey in Karachi

RECOMMENDATIONS

The industry suffers from not being organized, having little to no communication between elements in the supply chain, and not having a partnership with the government to deal with issues related to the environment, workforce, and export opportunities.

The private sector would benefit by:

- Sensitizing their supply chains (livestock breeding, skinning, transportation and others that handle hides and skins) to the quality needs of tanneries and the leather industry so that hides and skins are kept in better condition to produce higher-quality leather that commands higher prices;
- Organizing the industry into associations that provide the services needed by members, such as distributing market information on growing markets and trends, new technologies, and designs;
- Establishing relationships with design institutes and other educational institutions that focus on design;

- Reaching out to international brand names to possibly establish partnerships and then publicize these partnerships to build the reputation of the Pakistani leather industry;
- Using larger more established companies to impart knowledge to the medium and small tanneries about international standards and the benefits of complying;
- Working with the government to come up with solutions to environmental issues.

The government should consider:

- Providing more support to the industry given the inroads it has already made in global markets and its tremendous potential;
- Upgrading the government veterinarian and inspection services for livestock to reduce disease.
- Working in partnership with the private sector to solve environmental issues, move tanneries to less populated areas fairly reimbursing the tanneries for the move, and solving wastewater treatment issues.
- Provide incentives to upgrade technology in the sector, provide the accompanying training, and reduce duties on imports of the machinery required to modernize the industry.
- Supporting vocational training in this sector along the lines of the successful UNDP program.[78]
- Tackling labor issues in partnership with industry.

The focus group in Multan recommended that the government:

- Fully reimburse the promised amount to the tanneries that were relocated to the Multan Industrial Estate.
- Put pressure on and work out a solution with the management of the Multan Industrial Estate to set up the wastewater treatment plant, which was promised, instead of threatening closure of the tanneries, which are not able to build their own facilities.
- Set up a specialized center on leather and leather products aimed at youth and women that could support small and medium-sized tanners, focusing on training on design, compliance with various national and international standards, and marketing.

[78] FIRMS focus group discussion in Multan

LIGHT ENGINEERING

Surgical and medical instruments rank 10th in the assessment and are a key export. Contributing to its relatively high ranking were high ranks in RCA (8th), EPI (5th), overall employment (6th) and youth employment (5th). Other parts of the light engineering sector scores relatively low on overall ranking of priority sectors, but light engineering appears to be a growing activity in Peshawar, Bahawalpur, Khanewal, as well as Karachi, Lahore, and Sialkot. Light engineering–related activities have significant implications for livelihoods, especially the employment of men and youth, which is critical to Pakistan's security. Developing skills in industries such as automobile and agricultural implements provides a base to support the growth and diversification of the light engineering sector—and prevents human resources from being diverted to activities such as making arms.

INDUSTRY AND MARKET STRUCTURE

The light engineering sector consists of an array of industries, including surgical and medical instrument, transportation equipment, household appliances, and consumer durables. The sector has been a growing segment of Pakistan's economy. Value-added averages 35 percent (37 percent for medical instrument manufacturers, 35 percent for automotive repair and services and 34 percent for agricultural implements). This figure is high, especially considering that most equipment, parts, and raw materials (steel and nickel for surgical and medical equipment) are imported[79].

The light engineering industry consists of more than 2,500 registered small, medium-size, and cottage industries. Clusters of small industrial units are operating in Gujarat, Gujranwala, Lahore, Sialkot, and Karachi.[80] There are a number of industrial zones in various districts set up for light engineering (a complete listing is available http://www.fpcci.com.pk/industrialzone.asp, the website of the Federation of Pakistan Chambers of Commerce and Industry).

The surgical and medical equipment began in Sialkot almost 100 years ago. It includes about 1,000 companies, including manufacturers and exporters of surgical, electro-medical, cardiovascular, gynecological, orthopedic, and dental instruments, as well as anesthesia products, body external fixation systems, and implants.[81] Sialkot remains the hub of the industry, but significant production, distribution, and marketing also take place in Karachi and Lahore.[82]The industry manufactures about 100 million instruments annually, almost all for export. Production in Karachi, however, is more geared to the domestic market, with many of the buyers concentrated in Karachi.[83]

The top 15 manufacturers of surgical and medical equipment are top-tier, vertically integrated producers; they account for 39 percent of total production. Second- and third-tier firms outsource some of their production/finishing processes to job shops. As this is a broad sector with many different end-user markets and segments, there are plenty of niche product and market opportunities.[84]

[79] FIRMS survey and calculation.
[80] "Pakistan Light Engineering Sector," Board of Investment, Government of Pakistan.
[81] Surgical Instruments Manufacturers Association of Pakistan (SIMAP)
[82] SIMAP, Board of Investment Light Engineering Sector Report and Presentation "Strategy for Upgradation of Surgical Instruments & Medical Device Industry"
[83] FIRMS focus group discussion in Karachi
[84] Board of Investment Light Engineering Sector Report and Presentation " Strategy for Upgradation of Surgical Instruments & Medical Device Industry"

Production of agricultural implements is a key industry in Bahawalpur, although they are produced in greater quantities and to higher specifications in Sialkot, Khanewal, Lahore, and Faisalabad. The largest cluster of firms producing agricultural implements is the Mianchuno cluster in Khanewal. In Bahawalpur, the sector employs about 200 men (120 skilled), most of them employed by firms located in Eidgah Chowk in Bahawalpur City. All of their sales are domestic, with about 30 percent within the district. Raw materials are purchased from Lahore. Focus group discussions indicated that this industry, particularly welding and fabrication, is a promising one for youth.

Pakistan currently produces more than 7 million fans a year. Its products are highly competitive on the international market, particularly in the Middle East. Producers are clustered largely in Gujarat, Gujranwala, Lahore, and Karachi.[85] Exports totaled 1.17 million in 2007 and 1.22 million in 2008.[86]The knives and cutlery industry is characterized by thousands of small, privately owned businesses and a few large conglomerates. Almost all output is exported.[87] Benefiting from improved skills and training centers, as well as foreign exposure, the value of exports grew from $26.43 million in 2000 to $76 million in 2007. Many producers in the knives and cutlery industry are located in Wazirabad, Nazimabad, and Allahbad.[88]

Pakistan produces a diverse range of electrical equipment for generation, transmission, and utilization of electricity. This includes transformers, switchgear controls, electric motors, lighting, insulators, battery charges, and power generating machines. Consumer durables—including deep freezers, refrigerators, air conditioners, washing machines—meet domestic demand and successfully compete in the foreign market. Many electrical and electronic items are exported to the Middle East. Production of these goods totaled $200 million, of which $0.53 million was exported in 2007.[89]

Pakistan's automobile sector is wholly owned by the private sector. There are 18 automobile assembling units (set up as joint ventures) and 47 units producing motorcycles.[90] The sector employs more than 171,000 people and in 2005/06 contributed $1.84 billion to GDP.[91] Growth of this sector was extraordinary between 2003 and 2005, thanks in part to the lack of domestic and foreign competition because of high import duties and a mandate requiring that a certain portion of goods be domestically produced.[92] Lahore remains the auto parts center of Pakistan.

EXPORTS AND EXPORT POTENTIAL

The light engineering sector produced $200 million in export revenues in 2007.[93] Certain industries, particularly surgical goods and cutlery, have made breakthroughs in the export market. Surgical instruments dominate exports, accounting for 79 percent of the total ($157 million) (Table 32). Medical and surgical goods rank fifth on the Export Prospect Index (EPI = 1.4) and eighth on the Relative Comparative Advantage (RCA = 1.1) index in priority districts. World demand for surgical instruments grew steadily between 2002 and 2007, boding well for prospects for expanding exports.

[85] "Pakistan Light Engineering Sector," Board of Investment, Government of Pakistan.
[86] Global Trade Atlas (subscriber trade database), www.gtis.com
[87] "Engineering Industry in Pakistan – I," Industrial Advisory Reports, India Pakistan Trade Unit.
[88] "Pakistan Light Engineering Sector," Board of Investment, Government of Pakistan.
[89] "Engineering Industry in Pakistan – I," Industrial Advisory Reports, India Pakistan Trade Unit.
[90] "Private Sector Assessment, Pakistan" Asian Development Bank, December 2008.
[91] "Pakistan Light Engineering Sector," Board of Investment, Government of Pakistan.
[92] "Private Sector Assessment, Pakistan" Asian Development Bank, December 2008.
[93] "Engineering Industry in Pakistan – I," Industrial Advisory Reports, India Pakistan Trade Unit.

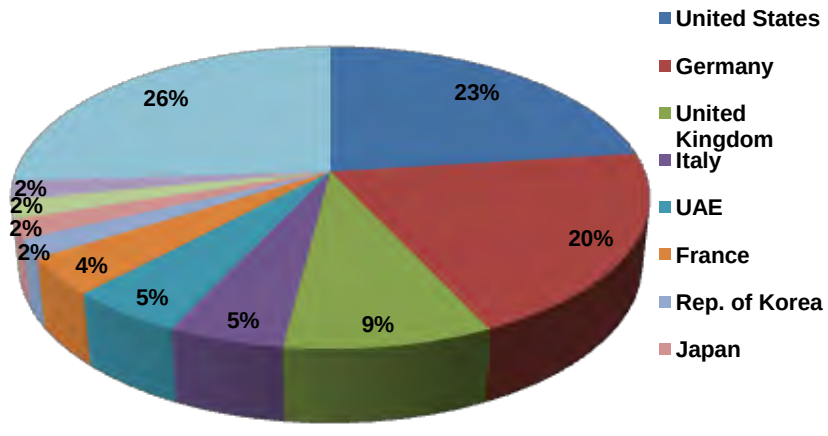
Table 38: Selected Export Indicators for Light Engineering

Product Name	Pakistan Exports in 2007 ($ millions)	Pakistan's export growth 2000-2007	World import growth (2000-2007)	EPI	RCA
Medical and surgical equipment	157.1	11.7	14.3	1.4	1.1
Cutlery, hand tools	76.4	6.0	9.0	0.4	1.2
Electric lamps	38.4	64.9	10.7	0.3	0.9
Other fabricated metal	22.6	9.1	11.9	0.2	0.1
Parts and accessories of machinery	18.4	38.3	10.5	0.1	0.0
Motor vehicles and parts	15.6	55.0	9.9	0.1	0.0
Agricultural and forestry equipment	8.8	16.2	12.8	0.1	0.2
Instruments and appliances	7.1	4.7	9.7	0.0	0.0
Pumps, compressors,	6.9	17.4	12.7	0.1	0.0
Other electrical equipment	1.5	1.6	10.5	0.0	0.0
Bodies (coachwork)	1.5	-1.7	15.2	0.0	0.0
Other transport equipment	0.4	151.6	12.1	0.0	0.2

Source:UN Comtrade Database

Surgical and medical instrument exports reached $200 million in 2009[94]. Sixty percent of exports were disposable products; reusables accounted for the remaining 40 percent. The top three export markets (Figure 2) for medical instruments are the United States (23 percent), Germany (20 percent), and the United Kingdom (9 percent).[95]

Figure 2: Share of Pakistan's Surgical Instruments Buyers



Source: Board of Investment, GOP (2008)

[94] Global Trade Atlas, www.gtis.com
[95] The Medica, SIMAP, and FIRMS Focus Group

This sector has had to adapt to serious export-related challenges over the years. In 1994 the U.S. Food and Drug Administration (FDA), citing safety and quality concerns, imposed a ban on imports of medical instruments from Pakistan. The move forced the industry to improve its manufacturing and management systems and acquire vital certifications, including GMP, ISO, and CE. More than 300 Pakistani companies have ISO-9002 certification, and about 250 have certification of Good Manufacturing Practices.

The knives and cutlery industry has made some inroads in exports, with exports of $76 million in 2006. The sector has a comparative advantage, with an RCA of 1.4. A range of other light engineering exports, including electrical goods, also recorded impressive growth. Steady growth in world demand makes this a sector with future potential.

Industries producing household appliances have managed to find a niche market in the Middle East and could have a potential market in Africa, as income and use of consumer appliances there grows.[96] Export growth in the industry is constrained by the need for more companies to improve their operations and the quality of production and attain international certifications.[97]

INVESTMENT

Fixed assets in the engineering sector totaled $1.2 billion in 2007.Total capital investments in Pakistan's medical instruments industry are estimated at $223 million. Additional investment is needed to upgrade the metal forging and finishing skills and improve quality testing.[98]Industries in the sector typically suffer from serious technological deficiencies, lack of education among entrepreneurs, limited financial resources, and a change-resisting culture. Engineering Vision 2010—a plan that seeks to build Pakistan into an economically strong economy by invigorating engineering industry—estimates the need for $10–$12 billion in additional investment in the sector.[99]

EMPLOYMENT AND WORKFORCE DEVELOPMENT

The light engineering sector employs 19 percent of the Pakistani manufacturing-related workforce. Of this, the automobile industry employs 171,000 people, the surgical and medical equipment industry employs 150,000,[100]the fan industry employs 30,000, and the cutlery industry employs 25,000.[101] Auto body shops are also an important employer. In Peshawar, for example, employment had been rising in this sector because of the increasing number of new and used cars in Peshawar, but it recently declined as a result of the deterioration of law and order.

The surgical and medical equipment sector has the strongest linkages with the following academic institutions: the Institute of Business Administration (IBA),in Karachi; the University of Engineering and Technology (UET), in Lahore; the Ghulam Ishaq Khan Institute of Technology (GIKI), in Topi; Hamdard University, in Karachi; NED University of Engineering and Technology in Karachi; the University of Punjab, in Lahore; the Swedish University of Engineering, in Sialkot/Gujranwala; the Anne Marie Schimmel-Haus, in Lahore; and Government College University, in Lahore.[102]

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[96] "Engineering Industry in Pakistan – I," *Industrial Advisory Reports,* India Pakistan Trade Unit.
[97] "Engineering Industry in Pakistan – I," *Industrial Advisory Reports,* India Pakistan Trade Unit.
[98] SIMAP
[99] "Pakistan Light Engineering Sector," *Board of Investment,* Government of Pakistan.
[100] SIMAP and The Medica
[101] "Engineering Industry in Pakistan – I," *Industrial Advisory Reports,* India Pakistan Trade Unit.
[102] Presentation " Strategy for Up-gradation of Surgical Instruments & Medical Device Industry," SMEDA

The sector employs many youth. The lack of technical education forces most people to learn on the job. The introduction of formal education in this sector would greatly enhance the capabilities of youth and the quality of service.

SUPPORTING ENVIRONMENT

The sector faces many constraints, including the high costs of production inputs and taxes and duties on finished goods and raw materials.

SUPPORTING INFRASTRUCTURE

Frequent power cuts hurt this industry tremendously, particularly factories that cannot afford back-up power supplies. In Karachi, the surgical and medical instrument industry in September 2009 estimated 25 percent of work hours were lost due to cuts. In Bahawalpur, during the same time period, power cuts in the agricultural implements industry occur for 24 hours a week, leading to missed and dropped orders. The focus group there estimated they could double their sales and production if an uninterrupted power supplies were available.

SUPPORT SERVICES

Product quality and manufacturing processes have changed over the years, and competition has emerged from Malaysia, Poland, Hungary, China, the Republic of Korea, and India. Pakistan has a reputation for producing mostly lower-quality instruments. In light of these concerns, the Surgical Instruments Manufacturers Association of Pakistan and the Trade Development Authority of Pakistan are working on improving the quality of metal finishing and upgrading the capabilities of the Sialkot Material Testing Laboratory (MID).Many experts do not believe that MID's operations have kept up with rapidly changing international requirements and markets.

There is also a growing realization within the sector that new products and brands need to be created to maximize value, something that is being pursued by various parties. Greater collaborations between companies and the medical profession is also being encouraged as one way to facilitate new product development.[104]

Government Incentives for the Surgical and Medical Equipment Industry in Pakistan

- Exporters can finance 41.60 percent of the previous year's export proceeds at a concessional mark-up rate of 8 percent (Refinance Scheme)
- A duty drawback at 12.5 percent
- Exemption for select machines (17 of them) from customs rates and sales taxes, but only for industrial units recognized by provincial or federal governments
- Income tax deduction of 0.05 percent.[103]

Focus group discussions indicated that there are no common forums for lobbying for of resolving sector issues. However, the Engineering Development Board is responsible for strengthening the engineering base in Pakistan. It focuses on developing the engineering goods and service sector in line with modern practices so that production is technically sound and globally recognized.[105] The Pakistan Engineering Council (PEC) registers engineers and consulting engineers, accredits

[103] FIRMS Focus Group Discussion Karachi
[104] TheMedica, SIMAP, Board of Investment Light Engineering Sector Report, Presentation " Strategy for Upgradation of Surgical Instruments & Medical Device Industry," and FIRMS Focus Groups
[105] Engineering Development Board website.

engineering programs run by universities and other institutions, and establishes standards for engineering products.[106]There are a number of accredited engineering institutions in Pakistan (Table 33).[107]

RECOMMENDATIONS

The entire light engineering industry needs to recognize that new technologies as well as advances in the professions that they serve make it imperative that they catch up and keep up if they are to continue to compete in global markets. The surgical and medical instruments industry, in particular, needs to:

- Introduce and invest in modern production techniques, such as the use of molds and dies formed by computer-added design and manufacturing[108].
- Widen the range of products produced—there are new needs and opportunities every day as discoveries are made in the field of medical science[109].
- Look into the business opportunities for manufacturing specific equipment for handicapped persons as this market grows dramatically[110].
- Form and work in partnerships with the leading medical schools, hospitals, and doctors in Pakistan and abroad to develop new products and equipment for new processes.[111]
- Look beyond the US and European markets for export opportunities, particularly the Central Asian markets, Southeast Asian markets, and other South Asian and Islamic markets.
- Become much better acquainted with the standards for import for target export countries.
- Help organize or encourage entrepreneurs to establish a service to collect and make available data on a regular basis on foreign market demands, import regulations, tariffs, etc.
- Establish more direct contacts with the leading hospitals and medical centers of the world.
- Organize the industry so that it can benefit from a coordinated effort to procure inputs to take advantage of volume discounts, lower shipping prices, etc.

The government should consider:

- Providing research and development funding, training and research facilities to support advances in this industry[112].
- Supporting an upgrade of Sialkot's MID Laboratory so it is able to provide testing that meets changing international requirements.[113]

[106] Pakistan Engineering Council website.
[107] "List of Accredited Engineering Programs with Pakistan Engineering Council," *Pakistan Engineering Council.*
[108] FIRMS Focus Group Discussion Karachi
[109] FIRMS Focus Group Discussion Karachi
[110] FIRMS Focus Group Discussion Karachi
[111] "Engineering Industry in Pakistan – I," *Industrial Advisory Reports,* India Pakistan Trade Unit.
[112] "Pakistan Surgical Instruments and Medical Devices Strategic Working Group," PISDAC, USAID Pakistan, 2007
[113] "Pakistan Surgical Instruments and Medical Devices Strategic Working Group," PISDAC, USAID Pakistan, 2007

MARBLE

The marble sector ranks 12th in the sector assessment, thanks to its high rankings in value-added (4th), output per employee (6th), backward and forward linkages (6th), and national and international markets (7th).[114]The sector is present in four priority districts: Peshawar, Lower Dir, Buner, and Charsada.

Tiles and smaller marble slabs in Mehra Rajjar, Charsadda

Pakistan reportedly has enormous reserves of marble and granite. Although there have been no comprehensive surveys of reserves, more than 40 types of natural color marble are known to be mined, and initial estimates indicate that there are about 160 million tons of marble reserves across Pakistan, 98 percent of them in NWFP.[115] In 2004 quarrying firms and processors produced an estimated 100 million square feet of marble and granite, 97 percent of which was sold domestically, for about $20 million, even though exports bring in 25 times the unit value of domestic sales. Within Pakistan, about 80 percent–90 percent of the marble is used in the construction industry; the rest is used in handicrafts[116].

INDUSTRY AND MARKET STRUCTURE

The marble industry in Pakistan is severely underdeveloped. At the quarrying level, productivity suffers from indiscriminate blasting, poor quarrying techniques, and lack of infrastructure for handling and transportation. The processing industry suffers from low capacity utilization, lack of modern technology and skills, and limited value addition. Even in the domestic market, the final product is uncompetitive compared with lower-priced, higher-quality imports. There is significant wastage at every step of the value chain. The industry currently represents a small fraction of the GDP and less than 1 percent of exports, but the potential to raise exports and foreign exchange and deliver value to rural areas is immediate and significant[117].

Marble slabs in Shahqadar, Charsadda

Very few processing units are equipped with the machinery and equipment needed to process stone in accordance with international standards. Inappropriate raw material and lack of technical skill reduce output at these units to barely half of their installed capacity. Only about 25–30 units

[114] Trade data on the quarrying sector were used, because data on marb
in the category, the more aggregated trade data are sufficiently representative for the purposes of the present data analysis. District-level data are product specific.
[115] Pakistan Dimensional Stone Strategy: Square Blocks," *Pakistan Marble and Granite Strategic Plan 2005*
[116] Pakistan Dimensional Stone Strategy: Square Blocks," *Pakistan Marble and Granite Strategic Plan 2005*
[117] Pakistan Dimensional Stone Strategy: Square Blocks," *Pakistan Marble and Granite Strategic Plan 2005*

have the machinery to cut slabs, cross cut, or polish marble.

Most firms sell their products in domestic markets, despite the huge export potential, enormous reserves, and much higher prices for exports. The vast majority of processors cannot produce high-value-added products that are exportable, because they lack the necessary equipment and processing know-how. Recent problems with load shedding and the unrest in areas near Peshawar and Buner have disrupted the industry. Sector assessments, however, suggest that this young industry has great potential to add value and increase exports.

There are nearly 2,000 quarries and 1,500 processors in Pakistan. The marble and stone sector is concentrated in NWFP, FATA, and Balochistan, with primary clusters around Buner and Peshawar. NWFP had an estimated 390–415 processing units in 2002, which produced 4,600–5,000 tons of marble a day. At the district level, the largest cluster is in Buner, with 145–155 units. There are also clusters in Mardan (70–80 units), Swat (55–60 units), Warsak (55–60 units), Jehangira (40–45 units), and Hayatabad (Peshawar) (25–30 units).

Certain characteristics differentiate quality products in the marketplace. Color is the most important aesthetic element that determines product marketability. Color preferences vary across markets and stone types. Another important attribute is pattern. The pattern is produced by the weave or spatial distribution of the elements forming the rocks and from overlapping layers of different colors. Grain size is another determinant of market ability. It defines the size and shape of the crystals or lithoid elements that constitute the rock. All of these attributes play a role in the marketability of marble and stone[118].

The average value-added for the marble stone industry, including quarries and processors, is about 40 percent in Peshawar; the value-added for stone quarries in Buner is about 51 percent. Quarrying techniques are primitive (uncontrolled blasting is a common practice), and basic mining machinery and equipment are not widely available. This has resulted in heavy wastage and low production at mines: a recent value chain analysis conducted by the industry in shows that quarrying methods and antiquated technology cause 73 percent of potential volume to be wasted at the extraction and transportation stage with 85 percent wastage across the entire value chain.[119]

A considerable residual value stream is produced in the quarrying and processing stages, but it is not being fully utilized in a productive manner. For example, there is no industry in Buner to utilize small stones of irregular shape, which are byproducts of marble processing. Most of the materials are purchased by sales agents, who come to Buner and supply the materials to industries in Punjab, which crush the stones into powder and manufacture PVC pipes.

EXPORT AND EXPORT POTENTIAL

Finished and raw stone exports totaled $24 million in 2007/08.[120] They rose 33 percent to $32 million in 2008/2009. Growth in this sector has been strong since at least 2002 (Table 39).

[118] Cluster Diagnostic Study: Marble Processing, Rawalpindi/Islamabad, SMEDA, date not listed, statistics include 2004.
[119] Pakistan Dimensional Stone Strategy: Square Blocks," *Pakistan Marble and Granite Strategic Plan 2005*
[120] Trade Development Authority of Pakistan

Table 39: Marble exports, 2002 and 2007

Type of marble	2002 (millions of dollars)	2007 (millions of dollars)	Annual growth (percent)
Worked	0.89	2.47	22.5%
Finished	5.42	16.03	24.2%
Total	6.4	18.5	23.5%

Source: Trade Development Authority of Pakistan

The United States was the primary destination for Pakistani stone, accounting for 63 percent of exports ($12.2 million) in 2007 and 75 percent of the growth between 2002 and 2007. Other major importers are shown in Table 40. Statistics from 2007 are cited as these are more representative of the potential of the industry given that the law and order situation in the major regions where marble is found and the global financial crisis has reduced exports since 2007. In 2008, imports to the US dropped by $2 million and the statistics for the first half of 2009 indicate a further decline.

Table 40: Major Export Destinations for Pakistan Marble, 2002 and 2007 (millions of dollars)

Country	2002	2007
United States	2.97	12.20
European Union	1.03	1.82
Korea, Rep. of	0.19	0.89
Hong Kong (China)	0.68	0.47
United Kingdom	0.28	0.47
Russian Federation	0.00	0.37
Canada	0.43	0.34
Turkey	0.18	0.30
Germany	0.13	0.28
Japan	0.36	0.25
France	0.12	0.21
Ukraine	0.01	0.19
Czech Republic	0	0.19
China	0.02	0.16
Spain	0.20	0.15

Source: UN Comtrade Database

INVESTMENT

A good indicator of investment is the type of machinery used in an industry. Most marble manufacturers use vertical cutters for strips and 18-inch section machines for sizing, which limits the final product to 1 x 1 or 1 x 2 foot tiles. The use of gang saws would allow manufacturers to

produce slabs, which fetch a higher price per square foot. Production of slabs in addition to tiles would also diversify the sector's product offerings.

EMPLOYMENT AND WORKFORCE DEVELOPMENT

Different categories of jobs available in marble cutting and polishing units include technicians, machine operators and unskilled labor. Machine operators are generally paid on the basis of feet of marble stone cut and polished. More than 70,000 people are employed in the marble sector.[121] Employment of women is very low. In Buner no women are directly employed in the sector. Youth are favored in this industry, which requires significant strength.

There are no vocational training centers for quarry or processing technicians. The Center of Excellence in Geology at the University of Peshawar, the University of Engineering and Technology Peshawar, Engineering University, and the Khuzdar and Nadirshaw Edulji Dinshaw (NED) Engineering University in Karachi offer degree programs for geologists and mining engineers, but the programs do not have a focus on the marble industry.

SUPPORTING ENVIRONMENT

A regulatory framework is largely lacking in the sector.[122] Land is owned and regulated by provincial governments, which lease quarries to investors. Leases can be and are canceled without notice. The lack of property rights and contract enforcement constrains quarry management and investment. The situation is leading to enormous wastage, as companies mining the quarries try to remove product as quickly as possible (before they lose access to the quarry), without planning for the best and most productive use of the quarries.

Marble in Shadgadar, Charsadda

SUPPORTING INFRASTRUCTURE

The lack of reliable electricity, water, and gas have greatly limited sector growth. Load shedding has had a major negative impact. In Buner, for example, all marble processors surveyed in September 2009 were unhappy with the electricity services in the district. Recent analysis of the marble industry found that productivity could be increased by 20 percent–25 percent if uninterrupted power was supplied at the right voltage[123].

The Pakistan Stone Development Company (PASDEC) is establishing "marble cities" (industrial estates) throughout Pakistan for the dimensional stone industry at various locations. These model cities are to be set up under international business and industry standards, supervised by international experts. The Marble City Project seeks to increase productivity by providing high-end industrial knowledge, innovation, and services. The concept is based on bringing together an industrial state with state-of-the-art stone technology, custom facilities, and cutting-edge services to create the largest and most technologically advanced industrial park for marble and granite in

[121] Labor force Survey, 2003–2004
[122] "Pakistan Dimensional Stone Strategy: Square Blocks," *Pakistan Marble and Granite Strategic Plan 2005*
[123] Buner Focus Group Discussion for FIRMS

Pakistan. The Marble City Projects will create Common Facility and Training Centers for training local managers, workforce, and technicians to cut square dimension blocks into slabs and to polish and cut them to size according to international standards. The centers are to be run by both local and international experts. A Mosaic Development Center is to provide industrial training in producing marble mosaic, handicrafts, and inlays from industrial waste. The facility will provide cutting, polishing, and sizing services at reasonable rates.[124]

SUPPORT SERVICES

PASDEC was established under the guidance of the Ministry of Industries, Production and Special Initiatives to drive the development of the marble and granite sector. It represents the major players and stakeholders in the value chain, including mine leaseholders, miners, processors, marketers, and the government. It is funded primarily by the government of Pakistan.

There are two industry associations: The All Pakistan Marble Mining Processing Industry and Exporters Association (APMMPIEA) and the All Pakistan Miners Owners Association (APMOA).While they have helped to organize the industry, there is limited capacity to provide the services needed without outside (i.e., foreign) technical assistance. Quarry managers and processors lack knowledge of the properties of locally available stone that would enable them to determine the most appropriate uses of the stone.

The Center of Excellence in Geology at the University of Peshawar has, on occasion, provided geological and topographical mapping services to the industry. Marble centers were proposed in Peshawar and Sindh but not established.

Cluster of Marble Processing Units

RECOMMENDATIONS[125]

The marble industry needs to change the way it operates in order to preserve and benefit from the value of marble in the quarries in Pakistan.

The private sector needs to:

- Adopt better quarrying practices, which reduce wastage and preserve value. A sufficient and constant supply of electricity is required to use the equipment required for these practices.
- Investment should be made in workforce development to create a skilled, specialized workforce that can raise productivity and competitiveness of the sector in the long run. The industry has identified on-site practical training, the establishment of Common Facility Training Centers to model processing and training, and the development of world-class evaluation expertise as key investments toward workforce development. The industry needs to work in concert with the government to put these initiatives in place.

[124] "Marble City," *Pakistan Stone Development Company, Government of Pakistan*

[125] Recommendations come from the report, "Pakistan Dimensional Stone Strategy: Square Blocks," *Pakistan Marble and Granite Strategic Plan 2005,* unless otherwise noted.

- Establish partnerships with the local government to help develop the infrastructure and connected services for handing and transportation of marble.
- Strengthen national and district-level industry organizations so they are more inclusive and provide the needed services, including industry and market information, updates on technological advances and techniques, workforce development, etc.
- Develop ties with educational institutions that can develop curriculums related to topographical mapping, geological survey, environmental management, physical testing of stones, prospecting and planning of the quarries as well as valuation expertise to support further investment in the sector.
- Supporting associations that can continue the public-private dialogues to ensure policy reforms.
- Work with the government, donors, other interested parties to set up model demonstration projects that use international best practice quarrying technology and processes.

The government at all levels should consider:

- What business environment improvements are needed so that the private sector mines quarries (rather than "blast and run"), invests in new equipment and in training the local workforce and, at the very least, strengthen the security of land leasing contracts
- Finding ways to prevent and protect the industry from load shedding, which takes a terrible toll[126].
- Investing in training initiatives, particularly hands-on training on modern equipment, in cooperation with the local associations. A good model is the Footwear Training Institute in Charsada.[127]
- Establishing minimum quarry standards by phasing in a ban on indiscriminate blasting.
- Working with financial institutions to offer financial products that are collateralized via the quarries and equipment, are attractive to this industry, and make it possible to import modern equipment.

[126] FIRMS focus group discussion in Buner.
[127] FIRMS focus group discussion in Charsada.

MEDICAL SERVICES

Medical services emerged as the 7th-ranked sector in the assessment. The sector's prominence is explained by its high scores on value retention (ranked 6th), through backward and forward linkages within priority districts (ranked 9th), as well as high demand and relatively high potential for employment creation (ranked 2nd), including employment for women (ranked 5th).

Medical services, especially nursing and paramedical services, tends to attract a larger share of women than many other sectors. Female health workers (known in Pakistan as a "lady health workers") have formed the backbone of the primary health care system for the past 15 years. These women are members of the communities they serve and are responsible for 150–200 households (about 1,000 people) each. They provide primary health care with a focus on reproductive health and family planning.[128]

The sector's benefits extend beyond the sector itself: health care plays a key role in determining the quality of human capital. Better health improves the efficiency and the productivity of the labor force, contributing to economic growth and improvements in human welfare.

INDUSTRY AND MARKET STRUCTURE

Pakistan has a large healthcare industry. The government is by far the main provider of hospital care in rural areas and the main provider of preventative care throughout the country.

Karachi plays a prominent role in the industry. The leading medical schools—the Aga Khan University Faculty of Health Sciences (Medical College and School of Nursing) and Dow University of Health Sciences—have their campuses there. Karachi is also a center of research in biomedicine and home to more than 30 public hospital and 80 private hospitals, including the Karachi Institute for Heart Diseases, Spencer Eye Hospital, Aga Khan University Hospital, and Tabba Cardiac Medical Center.

The role of the private sector in providing health care in Pakistan has not been widely researched, although Austrade, a publication of by the Australian government, reports that private healthcare is thriving and competitive.[129] Austrade reports that foreign suppliers of medical services are from the United States, China, and Europe. The FIRMS research team in Karachi reports a significant presence of private health care there. Anecdotal evidence from the priority sectors points to a growing presence of private services, largely informal and not captured in survey data, in the more rural provinces. In Buner, for example, there is a growing number of private sector health care facilities—10 at last count—although the shortage is still tremendous. The population per hospital bed is extremely high at 3432 compared to 1609 for the province.[130]

According to the World Health Organization (WHO), there are approximately 113,206 doctors, 48,446 nurses, and 71,600 lady health workers (primary health care providers) in Pakistan. With a

[128] Community Eye Health Journal 2009; 22(70): 26
[129] "Healthcare to Pakistan: Trends and Opportunities," *Austrade,* Australian Government.
[130] FIRMS Focus Group Discussion in Buner.

population of more than 170 million people in 2004, this works out to 1 doctor for every 1,359 people and 1 nurse for every 3,175 people,[131]which is quite low.

Some districts suffer from an extreme shortage of medical services. Lower Dirhas 1 district hospital, 4 rural health centers, 18 dispensaries, and 29 basic health units. It has just two gynecologists, forcing most women in rural areas of the district to rely on traditional birth attendants and to go to Mardan and Peshawar in case of complications.

Reducing maternal mortality is a critical issue in Pakistan, where more than 25,000 women die each year from complications related to pregnancy and childbirth. The WHO safe motherhood program emphasizes the importance of access to emergency obstetric care. Most women in Pakistan deliver using a traditional birth attendant. Very few have been formally trained, and almost all lack proper medical instruments. WHO recently designed and provided training for traditional birth attendants in Pakistan. Integrating them into an improved health care system improved health behaviors and pregnancy outcomes. Initial training schemes have significantly reduced perinatal-neonatal mortality.[132]

Both the public and private sectors, as well as a number of nongovernmental organizations, provide healthcare services. In 2008-09, 55 new facilities (40 basic health units and 15 rural health centers) were added. The total numbers of public and private healthcare units are shown in Table 41. There are just over 25 large hospitals in Pakistan's public sector (run by provincial health departments), each with an average capacity of more than 500 beds. The average private hospital is small with 30 beds.

Table 41: Numbers of Types of Public and Private Healthcare Institutions

Healthcare Institution	Public	Private	Total
Basic health units and subhealth centers	5,310	20,000	25,310
Dispensaries	4,794	340	5,134
Hospitals	948	520	1,468
Maternal and Child Health Centers	908	300	1,208
Rural Health Centers	561	0	561
Tuberculosis Centers	293	0	293

Source: Economic Survey for 2008-09

In 2008-09, 5,000 new doctors, 3,500 new nurses, and 450 new dentists were hired with the new totals for these service providers show in Table 42. Rapid population growth means that the number of people per healthcare provider will remain very large, at 1,212 per doctor and 18,010 per dentist, despite additions such as those in 2008-09. As the population is projected to continue growing rapidly, it is estimated that the number of physicians per 1,000 people will stagnate, at just 0.8.

[131] "Pakistan Country Profile: Health Development Situation," *World Health Organization.*
[132] "Pakistan Country Profile: Health Development Situation," *World Health Organization.*

Table 42: Numbers of Types of Healthcare Service Providers

Healthcare Service Providers	2008-09 Additions	New Total
Doctors	5,000	133,956
Nurses	3,500	65,387
Dentists	450	9,012

Several of the priority districts face additional challenges as a number of doctors and nurses left during conflicts and have not returned. Those that stayed are dealing with vandalized offices, stolen vehicles and equipment.

DOMESTIC DEMAND AND POTENTIAL

Some wealthy Pakistanis go abroad for treatment, particularly for complex surgeries, despite a large presence of both public and privately managed hospitals. Pakistanis seek treatment overseas because they seek better-quality care or a procedure is not performed in Pakistan.[133]

Pakistan's health indicators suggest that health services are poor. In the priority and secondary districts, basic medical care, hospitals, and staff are inadequate, and the basic infrastructure needed to establish and maintain basic health care facilities, particularly electricity, is lacking.

Almost three-quarters of healthcare expenditure in Pakistan consists of out-of-pocket spending. The public sector is the main provider of hospital care, but government expenditure on healthcare is extremely low. Although it represents an increase of 8 percent year on year, the budgeted outlay for the health sector in fiscal 2009/10 (July–June) is $77 million--equivalent to just 0.4 percent of total budgeted spending. Total healthcare spending will be stagnant as a proportion of GDP in 2010–14, as spending grows at a slower pace than economic expansion. In 2009 expenditure on healthcare was equivalent to 2.4 percent of GDP; this figure will remain unchanged throughout the forecast period.

In 2007 the WHO concluded that $34 per capita is required to provide a package of essential health care services. Pakistan currently spends about $4.2 per capita—just 12 percent of the WHO recommended level. As a result of the low expenditure by the government and lack of or unaffordability of services, about 45 percent of the population lack access to primary healthcare.

The market for health insurance is also poorly developed. Traditional, community-based insurance programs are the main providers of insurance. A local provider, EFU, was the first specialist health insurer in Pakistan. It established a joint venture with a German insurance company, Allianz, in 2000.

Rising life expectancy, the consequent increase in the number of elderly people, and increasing urbanization will continue to expand demand for healthcare services. Although the proportion of the population over 65 has grown only gradually in the past decade, this age group has expanded by almost 1.5 million people. The rise in the urban population has been more marked: it has grown to

[133] "Healthcare to Pakistan: Trends and Opportunities," *Austrade,* Australian Government.

about 40 percent of the population, from just over 30 percent in 1992. This increase presents challenges for sanitation and prevention of communicable diseases. The government has made non communicable diseases and injuries (2 of the 10 leading causes of mortality in Pakistan) top priorities in its public health agenda.

Table 43: Actual and Projected Human Development Indicators, 2005–13

Indicators	2005	2006	2007	2008	2009	2010	2011	2012	2013
Life expectancy and infant mortality									
Average (years)	63	63.4	63.8	64.1	64.5	64.8	65.2	65.6	65.9
Men (years)	62	62.4	62.7	63.1	63.4	63.7	64.1	64.4	64.7
Women (years)	64	64.4	64.8	65.2	65.6	66	66.4	66.8	67.2
Infant mortality rate (per 1,000 livebirths)	72.7	70.7	68.8	66.9	65.1	63.4	61.6	59.8	58.1
Healthcare spending									
Total spending (billions of PAK Rs)	137	153	204	279	325	338	376	413	461
Total spending (millions of dollars)	2,309	2,547	3,358	3,964	3,997	4,068	4,479	4,879	5,406
Per capita spending (dollars)	14	15	19	22	22	22	24	25	27
Percent of GDP	2.1	2	2.3	2.4	2.4	2.4	2.4	2.4	2.4
Consumer expenditure (millions of dollars)	1,751	1,978	2,234	2,619	2,807	2,989	3,352	3,773	4,293
Other indicators									
Doctors (per 1,000 people)	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Hospital beds (per 1,000 people)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6

EMPLOYMENT AND WORKFORCE DEVELOPMENT

A 2009 review of Pakistan's medical sector suggests that the greatest demand is for nurses, paramedics, and skilled birth attendants. To try reduce this imbalance, the Ministry of Health recently inducted more than 71,600 lady health workers—village-based community health workers who have completed secondary school and are trained to provide mainly preventive maternal and child health care and education in the community.[134] Before the lady health worker program was established, Pakistan's social and religious customs prevented women from entering the healthcare sector.[135]

[134] "Pakistan Country Profile: Health Development Situation," *World Health Organization*.
[135] "Country Cooperation Strategy for WHO and Pakistan 2005-2009," *World Health Organization*.

The rapid increase in the number of medical colleges increased the number of doctors, but training for nurses, paramedics, and supporting health staff remains poor. There are 64 teaching hospitals and 68 medical colleges in Pakistan but only 14 nursing schools. There is consequently a significant shortage of trained nurses. According to the WHO, the ratio of doctors to nurses should be 1:3. This ratio is reversed in Pakistan, which has a 3:1 a ratio of doctors to nurses. There is potential for medical colleges and nursing schools to offer distance learning programs and degrees.[136]

Pakistan has 38 paramedic institutes in the public sector. Certification is of little value, however, because there are no nationwide curricular standards. Furthermore, the vast majority of those trained in paramedic institutes go on to work in the private sector. Recognizing the disconnect between educational facilities and the needs of the population, the government is seeking to reform the paramedical facilities by emphasizing needs-based change.[137]

INVESTMENT

There has been a long-term failure to reinvest in staff, management systems, physical infrastructure, technology development, quality assurance, and quality control.

SUPPORTING ENVIRONMENT

A major challenge in the healthcare sector is the imbalance in the workforce and the lack of nurses, paramedics, skilled birth attendants, and health system managers. For every three physicians, there is just one nurse, and almost 70 percent of deliveries are not assisted by a skilled birth attendant.[138]The lack of nurses is largely a result of cultural barriers limiting women's participation in the workforce.

Limited financial resources committed to the health sector in Pakistan exacerbate the problem. There are insufficient funds to maintain a functioning primary healthcare system and train nurses, paramedics, and skilled birth attendants. Total health expenditure is only 2.0 percent of gross domestic product (GDP), far lower than the 5 percent recommended by the World Health Organization.[139]

SUPPORT SERVICES

The Pakistan Nursing Council is an autonomous body responsible for registering (licensing) nurses, midwives, lady heath workers, and nursing auxiliaries. It also sets the curriculum for the education of these vocations, inspects educational institutions, maintains standards of education and practices, and plays an advisory role throughout the country.[140]The Pakistan Institute of Medical Sciences provides teaching and training in medicine and surgery to doctors and other health workers at various levels.[141]The Health Service Academy in Islamabad--an academic institution offering students a public health curriculum--and the infrastructure of provincial and district health

136 "Sector Report: Healthcare Pakistan," *UK Trade Invest.*
137 "Paramedics in Pakistan: Data Collection," *WHO – Government of Pakistan (joint collaboration)*
138 "Sector Report: Healthcare Pakistan," *UK Trade Invest.*
139 "Independent Evaluation of Major Barriers to Interrupting Poliovirus Transmission in Pakistan," World Health Organization, October 20 2009.
140 Pakistan Nursing Council website.
141 Pakistan Institute of Medical Sciences website.

development centers are not functioning to their potential and require considerable technical assistance.[142]

RECOMMENDATIONS

The private sector would do well to invest in the development of systems that can provide information to potential users of their services related to the quality of care and satisfaction of those that have used their services.

The government should consider the following:

- Developing an accreditation system to help provide quality control over healthcare facilities and training.
- Improving regulation of private healthcare providers.
- Increasing expenditure on research and development related to healthcare.
- Supporting development of health

[142] "Country Cooperation Strategy for WHO and Pakistan 2005–2009," *World Health Organization*.

PHARMACEUTICALS AND BOTANICALS

Manufacture of pharmaceuticals and medicines (including herbal medicine) ranks eighth overall in sector assessment and emerged as one of the main employment-generating industries. The sector ranks second in overall employment, third in female employment and forward and backward linkages, and fourth in youth employment.

INDUSTRY AND MARKET STRUCTURE

Pakistan's pharmaceutical industry produces all the major pharmaceuticals and some special products, such as immunologicals, cancer and diabetes drugs, and antidotes. About 75 percent of all pharmaceutical production is generic drugs. There are 430 pharmaceutical firms in Pakistan, including 406 national and 24 multinational firms. Pharmaceutical companies have operations in most of the major urban areas of Pakistan (Faisalabad, Hyderabad, Islamabad, Karachi, Lahore, Multan, Peshawar, and Quetta). Most activity takes place in Karachi.

There is plenty of competition in generic drug production. In contrast, only a small number of firms have secured approval from the Drugs Control Organization to produce branded proprietary products. Within the pharmaceutical industry, the level of competition decreases with a smaller number of firms specializing indifferent types of drugs, particularly branded proprietary products.

Value-added data are limited, because the primary research identified the pharmaceutical industry as significant in only one of the priority districts. In Karachi value-added was 35 percent.

The prices of pharmaceuticals sold in Pakistan are determined by an advisory committee in the Ministry of Health. The body uses a system of price mechanisms and standard formulas that take input costs into account. The approach appears not to be working, as the committee has not officially raised prices since 2001.Some drug makers have acted unilaterally, increasing the prices of their products to reflect increases in the cost of raw materials, fuel and electricity, and the depreciation of the rupee. No penalties have been reported for companies that have increased prices.

Other regulations are also ignored. In December 2008, for example, it was revealed that only a small number of drug makers in Lahore were destroying their waste in incinerators, in violation of the rules governing hospital waste management rules.

DOMESTIC DEMAND AND POTENTIAL

Pakistan meets 80 percent of its domestic demand for medicines from local production. Its pharmaceutical market—estimated at $1.5 billion—has been expanding at a rate of 10 percent–15 percent over the last few years. Regulatory structures tend to be stringent, especially on imports from other developing countries.

EXPORTS

The sector thrives domestically, but the industry has not been exporting for long and, export revenues are still low (Table 44), although they have been growing since 2000.Exports in 2008 were about $111 million and poised to grow 35 percent over the next few years.

Table 44: Pharmaceutical exports, 1999/2000–2004/05 (millions of dollars)

Year	Exports
1999/2000	38
2000/01	38
2001/02	40
2002/03	43
2003/04	50
2004/05	63
2005/06	82
2006/07	102
2007/08	111

Source: Federal Bureau of Statistics

Pakistan exports drugs to a large number of Asian and African countries, with an expanding trade to Central Asian countries. These countries have a collective population of about 100 million people and almost no local manufacture of medicines, making them attractive to Pakistani pharmaceutical firms.

There is a burgeoning international herbal medicine market that some exporters from Karachi have tapped. Favorable import trends among high-income countries represent promising prospects for some of the priority and secondary district producers.

The pharmaceutical industry is considered an export success in Pakistan. Exports in 2008 exceeded $100 million. However, the industry imports most of the chemicals and other raw materials and production machinery from China, Taiwan (China), the Republic of Korea, India, Germany, the United Kingdom, the United States, and Japan. It is thus vulnerable to events in other countries, which could restrict production volumes of key materials. The industry's profitability has been reduced by duty rates, which has curtailed its ability to expand and modernize. However, in June 2009, import duties on 19 types of raw materials and active ingredients were reduced from 25 and 10 percent to 5 percent[143].

INVESTMENT

The pharmaceutical industry has spent about $1.2 billion in the domestic pharmaceutical industry to expand production and decrease imports of finished drugs over the last decade. There is a need to invest in able to produce more intermediate and other essential fine chemicals—a high proportion of which are imported—to produce finished products.

[143] "Pharmaceutical Industry: Duty Slashed to 5% on Import of Raw Materials Ingredients," www.dailytimes.com.pk, June 24, 2009.

EMPLOYMENT AND WORKFORCE DEVELOPMENT

Total employment in the pharmaceutical industry is 70,000 people and indirect employment to about 150,000.[144] About 89 percent of respondents in Karachi claim that they have no difficulty finding skilled labor. About 44 percent of respondents prefer to hire graduates from medical institutes while 33 percent prefer employees from the University of Karachi. Additionally, 67 percent of respondents claim to offer on-the-job training for new employees (Source: FIRMS).Total employment in the pharmaceutical industry is 70,000 people.

SUPPORTING ENVIRONMENT

Intellectual property protection in Pakistan is among the weakest anywhere in the world. In 2008 the U.S. Trade Representative placed Pakistan on its priority watch list of countries with weak intellectual property controls. Its report specifically mentioned the lack of protection for pharmaceutical products. Local drug companies are able to market generic copies of patented drugs without fear of legal censure. This strongly deters multinational firms from launching new brands in the country.

The Drugs Control Organization, which is part of the Ministry of Health, is the most important governmental organization governing the pharmaceutical industry. It executes its work under the Drugs Act of 1976 and its rules. It has field offices in provincial headquarters, which govern all imports of pharmaceuticals. It monitors compliance with conditions of drug manufacturing licenses, including Good Manufacturing Practices. The provincial governments have their own inspectorates for post marketing surveillance; the provincial quality control boards have jurisdictions over quality control.

SUPPORTING INFRASTRUCTURE

Some 56 percent of survey respondents in Karachi are not satisfied with piped water and consider its quality poor. Natural gas quality is considered moderate by 56 percent of respondents.

About 45 percent of respondents reported that the quality of electricity is poor; 33 percent of respondents rate electricity as good, and only 1 percent reported that it is excellent. In September 2009, the average loss to electricity load-shedding was 12 hours a week. As a back-up, pharmaceutical companies use a diesel generators to cover these losses during working hours, at a cost of Rs.16,768 per month—60 percent higher than what the public utility is billing them.[145] These additional costs need to be factored into pricing, making Pakistani products less price competitive.

SUPPORT SERVICES

The main industry associations are the Pakistan Pharmaceutical Manufacturers Association, Pharma Bureau, and the Pakistan Chemists and Druggists Association. The Karachi Chamber of Commerce and the Trade Development Authority also provide services to the industry.

Government and private institutions are more proactive in this sector than in many others: survey respondents in Karachi report receiving support of some kind. The government provides various

[144] "An Overview of Pakistan Pharma Industry – Tribute to Senator Abdul Haseeb Khan," Financial Daily, March 18, 2009
[145] FIRMS Survey in Karachi

types of technical assistance, such as assistance with certification and standards, and common facilities for manufacturing, testing, product development, research and development, and training.

Private associations provide both technical and marketing assistance. About 44 percent of respondents reported that private associations provide common manufacturing, testing, and research facilities; 44 percent stated that they had received assistance for establishing linkages with academia and research institutions and used information about industry trends. Other assistance from associations consists of information about competitors, assistance with production inputs, financial assistance, advocacy, and training.

RECOMMENDATIONS

The pharmaceutical industry would do well to concentrate on improving their quality and standards, their marketing and branding. Their main issues, though, are related to government policies, which requires more active advocacy efforts. The industry can tap into enormous potential with some fairly minor changes in government policy as well as a larger, comprehensive effort to protect intellectual property.

The government should consider the following:

- Improving intellectual property protection to attract investment and drive innovation in this sector and make it possible for Pakistani pharmaceutical companies to become licensees for new compounds.
- Removing price controls.
- Investing in and supporting R&D efforts related to this industry.

TEXTILES, APPAREL, AND CARPETS

The textile and apparel sector contributes more than 67 percent to total export earnings, accounting for 46 percent of total manufacturing, and employing 38 percent of the manufacturing labor force.[146] It is an engine for export earnings and employment opportunities for small and medium-size enterprises as well as the larger industries involved in the cotton-to-garment value chain.[147] The industry consists of five main subsectors: apparel, embroidery, linens and made-up textile articles, preparation and spinning of textiles, and carpets. The apparel subsector is at the apex of the textile value chain that begins with cotton. Over the past two decades, there has been a steady rise in the global market share of high-value apparel, especially for cotton-related garments. This trend is driven by frequent changes in the fashion trade, niche market opportunities, and diverse fabrics and materials, especially in the women's apparel segment. Pakistan has made substantial progress in apparel. Successfully exploiting its domestic value chain requires better integration.

Apparel is one of Pakistan's major economic activities and top-ranked exports and ranks first in the balanced scenario. The apparel subsector has high export-related scores: a rank of third for RCA and coming in first on EPI. It ranks ninth on value-added and female employment. The apparel subsector is represented in seven priority districts (because of the prominence of embroidery).It ranks6th in the number of enterprises. Its relatively high value-added, of about 30 percent, is considerably higher than in most countries that engage in apparel manufacture. The high value-added partially reflects the fact that Pakistan has exploited the backward linkages to the textile and yarn sectors, which is not a common feature among competing developing countries except China and India.

Embroidery, the second-ranked subsector, has a long history in Pakistan; Pakistan embroidery is considered some of the best in the world. Machine and hand embroidery is a major economic activity, heavily represented in eight priority districts, where it ranks third in terms of business presence. Embroidery ranks third on the EPI index and fourth in on RCA: index values were 21.3 and 10.57, respectively. Based on survey responses, hand embroidery activity appears to have strong district and regional market orientation.

Linens and made-up textile articles refers to textiles that are cut into squares and rectangles, produced in the finished state for use, simply hemmed, cut to size after undergoing a process of drawn threat work, or assembled. They include towels and cleaning cloths, bed linens, blankets, curtains and furnishings, canvas products, and table linens. Pakistan is the world's second-largest exporter of made-up articles after China. The survey response on this subcategory was limited to Peshawar, Karachi, and Multan. However, the sheer national ability and size and growth of the international market warrants attention on how best to reinforce capabilities within the priority districts.

Preparation and spinning of textiles has a weak presence in most districts, with only Karachi and Bahawalpur reporting it as a major economic activity. The category, preparation of spinning and textile, is dominated by yarn and lint in Pakistan. The subsector employs many women and youth,

[146] "Textile and Apparel Industry, Evaluation and Future Challenges in Pakistan," Dr. Noor Ahmed Memon, December 2008 and http://www.articlesbase.com/business-articles/the-pakistan-textile-industry-an-overview-205559.html
[147] Bahawalpur Sector Assessment

and output per employee is relatively high. It has both strong forward and backward linkages to the national economy and good export potential.

Carpet and rug production is a key economic activity in Peshawar and Multan. The industry has always played an important role in the economy of Pakistan, generating considerable foreign exchange. It ranks 5th in the balanced scenario, with RCA ranked 2nd and EPI ranked 6th. It also scores well on value-added (ranking 3rd) and employment (ranking 4th), particularly for women (ranking 3rd). Its low rankings for output per employee (30th) and input source (28th) reduce its score to below that for textiles and apparel.

Carpet Factory

INDUSTRY AND MARKET STRUCTURE

Pakistan has a spinning capacity of 1,550 million kilograms of yarn, a weaving capacity of 4,368 million square meters of fabric, and a finishing capacity of 4,000 million square meters. The industry has a production capacity of 670 million units of garments, 400 million units of knitwear, and 53 million kilograms of towels. Some 442 units are engaged in spinning, about 124 large units and 425 small units are involved in weaving, and 20,600 power looms are in operation.[148]

Pakistan has 521 textile units, with 10.1 million spindles and 114,000 rotors in operation, giving it the third-largest spinning capacity in Asia after China and India. In the weaving sector, Pakistan has an installed capacity of 7,600 units. About 300,000 small power looms operate around the country, many of them in Lahore, Faisalabad, and Karachi. There are about 7,000 towel looms of various sizes and 12,000 knitting machines in Pakistan.[149]

The geographical location of industries varies with subsector. The spinning and weaving industries are largely clustered in specific locations. Embroidery and spinning units are located in all administrative divisions, as these activities can be performed from workers' homes.[150]That said, in Lower Dir, embroidery is concentrated in Timergara, Samarbagh, Munda, Haji Abad, and Talash, where local governments offer technical and financial support to women and girls.[151]

Roll of Khadi Cloth

The embroidery and made-up articles subsector is represented in eight priority districts. Manufacture of other textiles (embroidery, clothes, and suits) is heavily represented in eight priority districts. Little preparation and spinning of textiles is done in the

[148] Pakistan Textile Mills Association (APTMA)
[149] Pakistan Textile Mills Association (APTMA)
[150] Bahawalpur Sector Assessment
[151] Lower Dir. Embroidery Sector Assessment

priority districts, except in Karachi and Bahawalpur, where the sector is a major economic activity. Table 45 outlines districts involved in the various textile subsectors.

Major input materials required by firms include yarns that come from different areas of Punjab e.g. Lahore, Daska, Jhang, and Multan while some threads are being imported from Iran. While carpet production takes place throughout Pakistan, Peshawar is particularly noted for its carpet industry and has 2,500 companies employing over 32,500 people in which about 16,000 are, reportedly, women. In total, the sector generated sales revenues of over USD 105 million with exports accounting for almost 95 percent of that.The value-added of this sector is about 45 percent.

Table 45: Districts Involved in Textile Subsectors

Subsector	Bannu	Bahawalpur	Buner	Charsada	Larkana	Lower Dir	Multan	Peshawar	Quetta	Karachi	Sukkur
Manufacture of wearing apparel	X			X		X	X			X	X
Manufacture of other textiles	X	X		X	X		X	X	X	X	
Preparation and spinning of textile (yarn)		X									
Manufacture of carpets and rugs							X	X			

Source: Assessment of Priority Districts

District-level data on the textile industry are limited. Review of the data that do exist suggests that district-level revenue and output vary greatly depending on the size of the subsector and its value-added. For example, revenue in the garment industry in Karachitotaled $26 million in 2008 with value added of 26 percent.[152]In contrast, embroidery in Sukkur brought in just $16 million, but with value added of about 45 percent.[153]

For the most part, the textile and clothing industry is not vertically integrated. The clothing sector operates independently of the weaving sector. Only the knitwear industry does its own knitting, using yarn from local mills. The woven garment sector is dependent on the national weaving and processing industry. There is no formal horizontal integration, however. The textile and clothing sector also has no horizontal integration. Although the textile subsectors appear to complement one another, no national or regional scheme ensures dependable linkages between the subsectors, supply of goods, or related services. The first attempt of horizontal integration in the textile industry is just beginning.[154]

The carpet industry is a cottage industry that is spread widely throughout Pakistan and provides livelihoods to people in rural areas. It is an important source of income for families that do not have alternative income sources. Barriers to entry are low, because entering the field requires just a wooden loom, yarn, and an aptitude for knotting. The industry is wholly indigenous, as even the machines used are manufactured in Pakistan. Women play a dominant role in this industry, but so do children, which damages the reputation of Pakistan's industry and competitiveness in the international market.

[152] FIRMS Karachi survey of garment industry
[153] FIRMS Sukkur survey of embroidery industry
[154] "Adding Value: Building Value-Addition Alliances," International Trade Center

EXPORTS AND EXPORT POTENTIAL

In 2005 the Multifiber Agreement, which established quotas on textiles and apparel imports, expired. Since then, Pakistan has lost some of its international competitiveness, as access to foreign markets is determined by price and quality competitiveness. Relative to competitors in India and China, textile manufacturers in Pakistan produce goods that are typically more expensive and of lower quality.

Despite decreasing competitiveness, exports of textile manufactures grew 6.2 percent in 2006/07, to about $5.2 billion. The increase was led by large increases in knitwear (13.9 percent), made-up articles (8.9 percent), and readymade garments (6.8 percent). Cotton yarn exports rose 4.6 percent, and exports of towels and other made-up articles rose 2.6 percent.[155] However, in 2008, exports of woven cotton dropped 17 percent, and other key exports stagnated[156].

The industry accounts for 60 percent of Pakistan's total exports. The global textile market is currently worth about $500 billion.[157] This represents a slight decline in demand, because major buyers—the United States, the European Union, Canada, and countries in the Middle East—have seen a loss in purchasing power as a result of the recent economic downturn.

The textile industry's strong presence and performance is exemplified by its astonishing RCA index of 54 and an EPI index of 25. It commands one of the most promising prospects for Pakistan for the foreseeable future. These remarkable static international market indicators suggest healthy prospects of market sustenance despite the perceived dominance of India or China. Bed, table, and toilet linens; curtains; and other made-up textile articles are the most promising product groups in terms of comparative advantage and world import demand (Table 46).

Table 46: Promising Textile Subsectors for Export

Product code	Product	World import growth 2000–06 (percent)	Pakistan's exports 2006 (millions of dollars)	EPI	RCA
6584	Bed, table, and toilet linens	11.3%	2,054.5	15.6	114.5
6522	Woven cotton fabrics nes	1.1%	717.9	0.5	141.0
6533	Woven synthetic f/cotton fabric	3.4%	493.9	1.1	90.0
6585	Curtains nes	15.8%	266.3	2.8	31.2
6589	Made-up textile arts nes	11.6%	233.2	1.8	28.0
6524	Woven cotton finish > 200g	5.0%	222.2	0.7	21.2
6523	Woven cotton finish < 200g	7.9%	210.1	1.1	18.3
6531	Woven synthetic filament yarn fabric	1.9%	89.7	0.1	4.0
6518	Yarn staple fiber etc < 5mm	5.6%	69.8	0.3	7.8
6525	Woven cotton blend < 200g	2.7%	44.6	0.1	15.9
6521	Cotton gauze/pile/chenille	10.2%	28.9	0.2	12.5

[155] UN Comtrade Database
[156] Global Trade Atlas, www.gtis.com (a subscriber database made available on a trial basis)
[157] http://pib.nic.in/release/release.asp?relid=33327

6583	Blankets/traveling rugs	13.5%	28.8	0.3	9.5
6582	Tarpaulins/tents/blinds	12.5%	21.9	0.2	7.2
6526	Woven cotton blend > 200g	5.8%	15.8	0.1	7.2
6534	Woven synthetic blends nes	2.8%	14.6	0.0	3.6

Source: UN Comtrade data *Note: nes = not elsewhere specified.*

A strong RCA tends to coincide with a strong EPI, but this is not always the case, as an industry or product for which international demand is strong may not be one with high export values and vice versa. Pakistan has to compete with two powerful neighbors—China and India—that allegedly offers subsidies to their textile sectors. The challenge is to untangle the export impediments in major markets and retain competitiveness.[158]

The performance of major apparel items is as impressive as that of textile products, Menswear, particularly trousers, jerseys, and tee-shirts, scores very highly on both RCA and EPI; women's trousers and tee-shirts benefit from international demand that is growing by 10 percent a year. Two other products that need attention are men's and boys' suits (code 8432) and knitted and crocheted apparel (code 8495); Pakistan's exports have not kept pace with high and rising world demand for either product. The challenge is to harness the advantages in the districts and link industries located in them to the knowledge and supporting institutions at the national level to exploit international markets.

Table 47: Promising Apparel Subsectors for Export

Product Code	Product	World import growth 2000–06 (percent)	Pakistan exports 2006 (millions of Millions)	EPI	RCA
8414	Men's/boys' trousers, woven	5.5	500.4	1.9	16.6
8453	Jerseys/pullovers	8.1	486.9	2.7	11.1
8426	Women's/girl's trousers, woven	10.0	324.5	2.2	10.8
8437	Men/boy knit/crocheted shirt	5.0	277.6	0.9	39.1
8454	Tee-shirts/singlets knit/crocheted	11.5	276.1	2.1	7.4
8462	Panty hose/hosiery knit/crocheted	9.9	215.2	1.4	20.4
8469	Made-up/parts clothing accessories nes	5.9	99.1	0.4	20.2
8458	Garments nes not knit/crocheted	8.5	88.1	0.5	8.2
8442	Wom/g outerwear knit/crocheted	11.0	77.4	0.6	4.7
8431	Men's/boys' coats knit/crocheted	9.2	73.7	0.5	62.4
8432	Men's/boys' suits	14.1	69.2	0.7	7.9
8448	Men's/boys' trouser/etc. woven	8.3	62.6	0.4	6.3
8461	Clothing accessories not knit/crocheted	2.3	54.0	0.1	6.8

[158] "Economic Survey of Pakistan 2006–07," *Accounting and Finance News*, Pakistan.

8438	Men's/boys' underwear etc. knit/crocheted	8.5	48.9	0.3	11.8
8416	Men's/boys' under/night wear, woven	0.8	43.2	0.0	25.9
8428	Women's/girls' under/night, woven	-0.1	41.8	0.0	14.9
8411	Men's/boys' coats, woven	5.4	38.6	0.1	4.2
8415	Men's/boys' shirts, woven	2.7	37.2	0.1	2.7
8459	Apparel nes knit/crocheted	12.1	34.6	0.3	5.8

Source: UN Comtrade data. *Note*: nes means not elsewhere specified.

Pakistan exported about $270 million of carpets, mostly to the United States, Germany, Italy, United Kingdom, Spain, Turkey, and France in 2007, which dropped to $250 million in 2008[159]. There are 400 carpet exporters across Pakistan, most of them located in the Punjab, of which about 100 can be considered active exporters (the rest generate overseas sales on an infrequent basis). Machine-made carpets, which bring in much less foreign exchange than traditional handmade carpets, are becoming more common.

Although customers in key export markets believe that Pakistani carpets are generally superior to Indian and Chinese carpets, the latter's cheap labor, low cost raw material and low utility/financing charges can give them a competitive edge over Pakistani products.The sector is also facing very tough competition from Iran. There are also major problems in the supply chain, quality control, and design. Pakistani manufacturers have long relied on conventional designs that are suffering from reduced demand while producers in India, Iran, and China have embraced graphic arts technologies to improve quality. The backlash over child labor from customers in the US and Europe has also hurt the Pakistani carpet industry in those markets.

INVESTMENT

Of the $4 billion invested in the textile sector between June 1999 and October 2006, more than 50 percent went to spinning, 25 percent to fabric, and a large portion to dyeing and finishing. Only nominal investment was made in the knitting, embroidery, and garments sectors, in which investment requirements are low.[160]

These figures are low given the size and importance of the textile industry. The lack of adequate investment has prevented Pakistan from integrating new washing, dyeing, finishing, stitching, and embroidery techniques, and it has limited skill development. Most Pakistani textile firms—particularly the 95 percent of firms that are small or medium-size—consequently target lower-end markets. Larger manufacturers sell to higher-end retailers in the United States and European Union and are vertically integrated, with capital-intensive production.[161]

EMPLOYMENT AND WORKFORCE DEVELOPMENT

The textile industry employs about 38 percent of Pakistan's industrial workforce. Table 46 shows the number employed in various key subsectors.

[159] Global Trade Atlas, www.gtis.com, subscription service for trade data
[160] "Pakistan's Textile Industry Overview," Market Reports
[161] "Pakistan's Textile Industry Overview," Market Reports

Table 48: Employment in the Textile Industry in 2007

Subsector	Number of people employed
Stitching	734,805
Weaving	294,213
Spinning	201,152
Processing and finishing	61,206
Knitting	47,221
Ginning	10,000

Source: Small and Medium Enterprise Development Authority (SMEDA) of Pakistan

Women have great potential in this sector, particularly in embroidery, preparation and spinning of textiles, and carpet and rug production. The embroidery subsector in the Lower District consists entirely of women. Women typically rely on a middleman to access the market and purchase raw materials, particularly in the more conservative regions.[162] To further encourage the employment of women in this sector, the first ever textile policy (2009–14) reimburses employers for social security and employees' old-age benefits for female employees and employees with disabilities.[163]

Women working in an embroidery unit

Pakistan's youth are also employed in this sector. In a sample of textile industries in Bahawalpur, about 65 percent of the 1,536 sample group were youths. The share of youth employment varies significantly across subsectors and regions.[164]

The Textile Institute of Pakistan and the National Textile University are Pakistan's premier textile universities. Both offer four-year bachelor's degree programs.

SUPPORTING ENVIRONMENT

The lack of growth in raw cotton production has had critical implications for the textile industry. The machinery installed in recent years is much older than that of Pakistan's competitors. As a result, machines consumer more power, produce less, and have higher maintenance costs. Combined with limited investment in research and development and a reputation for poor adherence to contracted quality and delivery schedule, these factors have greatly limited exports.[165]

The government is considering an 18 percent value-added tax on textile produce, and textile mills are facing rising costs, because the interest rates at which they borrowed between 2002 and 2005 rose from 6 percent–7 percent to 15 percent–16 percent. Such high rates have also stopped any new investment in the sector.

[162] Lower Dir. Embroidery Sector Assessment
[163] "Textile industry issues reimbursement of EOBI Contribution Order," Daily Times, October 11, 2009
[164] Bahawalpur Sector Assessment
[165] "Economic Survey of Pakistan 2006–07," Accounting and Finance News, Pakistan

The government is eager to improve the conditions of the textile industry and has adopted various initiatives and policy decisions to help boost the industry. In 2004 a separate Ministry of Textile Industry was established. This new ministry recently drafted the first-ever Textile Policy (2009–14). The strategy comprises a comprehensive set of initiatives and incentives to boost the textile sector. Measures include creation of the Textiles Investment Support Fund (TISF) to provide incentives for investment in specific areas and the Technology Up-Gradation Fund (TUF) to help finance investments; establishment of more industrial estates to provide infrastructural needs; and assistance with branding, grading, labeling, and other product marketing activities.[166]

SUPPORTING INFRASTRUCTURE

Pakistan's power shortage is causing massive load shedding and greatly reducing production levels. In Multan, for example, there are typically 24.4 hours a week of power cuts during working hours. This has reduced power loom productivity by 33 percent.[167]

SUPPORT SERVICES

The primary association in the textile industry is the All Pakistan Textile Mills Association (APTMA). APTMA serves as the national trade association of the textile spinning, weaving, and composite mills and represents the organized sector in Pakistan. It is the largest association in Pakistan, representing 396 textile mills (315 spinning mills, 44 weaving mills, and 37 composite units).[168] A complete listing of all textile-related associations is available at http://www.cybercity-online.biz/Links/LAssociPak.htm.

RECOMMENDATIONS

The private sector needs to evaluate its competitiveness with its global competitors and:

- Make improvements that can reduce costs and improve efficiency.
- Increase awareness of international quality standards, set up systems to comply with them, and obtain needed certifications.
- Prepare for enforcement of more stringent environmental standards.
- Assure nervous buyers of the reliability of supplies from Pakistan and work as an industry to help assure world markets of the continued viability and reliability of the industry.
- Improve marketing skills to continue to identify new overseas market opportunities and trends.
- The carpet industry would benefit from a focus on incorporating systems to produce consistently high quality carpets and the industry as a whole would benefit from the use of designers that could use computer-aided design technology to develop new patterns.

[166] Textile Policy 2009–14: Minister for Textiles Industry
[167] Multan Sector Assessment
[168] All Pakistan Textile Mills Association website

The government should consider:

- Supporting the industry in its efforts to assure current buyers for their reliability and efforts to attract new buyers.
- Support efforts to upgrade the technology used in the industry.
- Support workforce development efforts

ANNEX A - SIGNIFICANT SHIFT IN DISTRICT FOCUS

Original Districts (20)	New Districts (26)[2]	
	Priority (9)	Secondary (17)
Punjab (9)/Fed (1)	**Punjab (5))/Fed (0)**	
Lahore	Multan	DG Khan
Multan	Bahawalpur[1]	Rajan Pur
Islamabad		Khanewal
Gujrat		
Faisalabad		
Rawalpindi		
Sialkot		
Gujranwala		
Sargodha		
Kasur		
Sindh (5)	**Sindh (7)**	
Karachi	Karachi	Ghotki
Sukkur	Sukkur	Shikar Pur
Larkana	Larkana	Thatta
Hyderabad		Jacobabad
Mirpur Khas		
Balochistan (2)	**Balochistan (2)**	
Quetta	Quetta	Qila Abdullah
Lasbela		
NWFP (3)	**NWFP (12)**	
Peshawar	Peshawar	Charsadda
Mardan	Swat	Tank
Haripur	Buner	Hangu
		Bannu
		Dir Upper
		Dir Lower
		Kohat
		Lakki Marwat
		D.I. Khan