

Chapter 11

Agro-Industries in Pakistan

Hammad Badar, Abdul Ghafoor and Adnan Adeel*

Abstract

Agriculture in Pakistan is gradually being commercialised because of technological modifications, innovations and changes in consumer demand. Agriculture is no more confined to the production of raw agricultural commodities. Greater emphasis is being laid on production of value added agricultural products. As result, the number of agro-industries is rapidly growing. Currently, a wide range of agro-industries are operating in Pakistan to produce numerous food, fiber and other value added products to consumers and other industries for further processing. In addition to serving domestic needs, many of these industries are also exporting products to other countries. In addition to small scale agro-industries mostly operating in rural areas, several large national and multinational firms have invested in various agro-industries in Pakistan. This chapter presents the importance, production/processing capability and market potential of Pakistan's various agro industries such as cotton and textiles, sugar, wheat, rice, fruit processing, dairy, poultry, seed, fertilizers etc. Besides this, development opportunities with its implications and future challenges are also discussed.

Keywords: Agro-industries, wheat, sugar, rice, dairy, poultry, seed, fertilizers, cotton and textiles.

11.1. Introduction

Pakistan's agribusiness sector is experiencing a transformation from subsistence to commercial and market oriented sector because of rising consumer demand for value

Hammad Badar, Abdul Ghafoor and Adnan Adeel
Institute of Business Management Sciences, University of Agriculture, Faisalabad, Pakistan.
*Corresponding author's e-mail: hammad.badar@unf.edu.pk

Managing editors: Iqbal Ahmad Khan and Muhammad Farooq
Editor: Abdul Ghafoor
University of Agriculture, Faisalabad, Pakistan.

products are exported to other countries. GDP of the country is sizeable. According to Agricultural Statistics of 2013, the total number of agro-based industries in 2005-06 was 4242.

Broadly, these industries may be categorized into small and large scale industries. Small scale industries operate at smaller scale and may be of two types. Village based small units which are owned and controlled by rural households. They require use of physical labour. For example, pickles industry and chips industry. Other type requires medium-level investment and use of semi-automatic techniques. For example, edible oil and raw rice processing mills. Large scale industries require heavy investment, advanced technology and modern management skills. For example, sugar, food processing and textile industries. Following section briefly gives an overview of major agro-industries in Pakistan.

11.2. Cotton and Textile Industry

Textiles industry is the largest industry in terms of investment in Pakistan. It contributes one fourth to industrial value added and employs around 40 per cent of industrial labour force in the country. Pakistan is a major exporting country of textile products from Asian region and more than half of the country's exports comprise of cotton and textile products. Around 30 to 40% cotton production is consumed locally and remaining is exported in raw or finished form. The share of Pakistan in world exports of textiles and clothing is 1.8%.)

Local availability of basic raw material is a key factor for the success of any industry because it substantially contributes in lowering down the cost of doing business. (Pakistan's textile industry has the inherent advantage of being one of the major cotton producing country. The production of cotton was 13.983 million bales with a contribution of around 1.5 percent to GDP and 7.1% in agricultural value addition in 2014-15. The industry comprises of 1221 ginning factories, 549 spinning factories, more than 400 textile mills, over 275000 looms, 700 knitting units, 4000 sewing units, 650 dyeing and 300 oil expellers and more than 18000 small scale oil expellers (kohlus). These units are mostly located in Punjab and Sindh provinces of Pakistan.

The textile industry value chain is quite long involving a number of stages such as cotton production and picking, ginning, spinning, weaving, dyeing, finishing and

Although cotton and textile industries are major contributors in industrial growth, numerous factors hinder the realization of full potential of the industry. Some of these factors include inconsistent production of cotton, fluctuation in cotton prices and quality, energy crisis, unskilled labour, lack of modernization of machines, low value addition.

11.3. Wheat Flour Industry

- a. Wheat is the staple food and a major component of diet in Pakistan. From food security viewpoint, wheat is accorded high priority in agricultural related policies and plans. In 2014-15, it contributed 10 percent in agricultural value added and 2.1 percent to GDP. Annual domestic wheat production averages around 24 to 25 million tonnes which is mostly consumed locally. In case of surplus, Pakistan also exports wheat flour mostly to Afghanistan.
- b. For consumption, wheat grains are grinded in whole meal flour traditionally known as "Atta". Wheat flour is used for making bread or "Chapati", cakes and several other bakery products. (Wheat milling takes place in private sector and is carried out by small flour mills (traditional *chakkis*) and modern grinding plants. Small flour mills generally have daily capacity of grinding wheat up to five tonnes. Around 8000 small flour mills are operating in rural areas) In many parts of urban areas also, they provide wheat flour to urban consumers who prefer to have their own wheat milled individually. (The modern grinding plants in the form of flour mills operate at large scale and are located near to major cities for providing wheat flour mostly to urban consumers. According to estimate, around 950 commercial flour mills are operating in Pakistan.)

value added is the net output of a sector.

Although the flour industry is privately owned and operated, government regulates flour milling activities by issuing licenses under the Flour Mills (Control) Order of 1959, allocating domestic flour milling quotas and controlling wheat flour sale price. Flour mills procure their wheat supplies from government agencies such as Pakistan Agricultural Storage and Services Corporation (PASSCO) and provincial food departments at fixed release price as per the fixed quota based on their milling capacity. This supply is ensured in months other than harvesting months of wheat. Flour mills also purchase wheat from private traders often at higher price than the price of government wheat. However, flour mills may have to incur addition costs in case of government wheat in the form of uncertain quality and obligation to sell flour at regulated price. (The major challenges faced by flour industry include energy shortage, low quality of wheat and limited storage capacity.)

11.4. Rice Industry

Rice is the second staple food widely consumed after wheat in Pakistan. It is the second largest foreign exchange earner after cotton in Pakistan. It contributed around 0.7% to GDP and 3.2% to agricultural value added in 2014-15. Two varieties of rice i.e. long grain "Basmati" and coarse rice "IR" are commonly grown in Pakistan and are famous all over the world due to their excellent taste and aroma. Because of

rice to several countries with various brand names such as Guard Rice, Flora Rice, Roberts Rice and Sun Rice. The main export destination of Pakistani rice are UAE, Saudi Arab, Iran, Kenya and Afghanistan. Rice is mainly grown in Punjab and Sindh provinces.)

Rice industry is growing during the last three decades with increasing demand of basmati rice in local as well as export markets. More than 70% share of export of basmati rice goes to Middle East. More than 50% of rice industries in Pakistan are utilizing the combined facility of husking and polishing. Major rice processing units are located in rice producing areas of Punjab. The cluster of rice processing mills is present in major rice producing belt such as Lahore, Gujranwala, Sialkot and Hafizabad districts of Punjab. (Currently, more than 315 rice milling plants are working in Pakistan.)

(Rice milling generates several products including rice hulls or husk, rice bran, brewer's rice, rice bran oil, flour and starch and ash from hulls. These by-products are used for different purposes: The outer husk layer generated in the first stage of rice milling may be used as fuel in power plants, mulch and abrasives and packing material for protecting fragile cargo during shipping. Rice bran is produced from the outer layer of the brown rice grain and is used in cereals, vitamin contents and mixes. Brewer's rice is used mostly in the processing of fermented products. Rice bran oil is considered effective in lowering blood cholesterol level and may be used as cooking oil because of its high quality and delicate taste. Rice flour is gluten free and non-allergic and used in producing rice pasta, cereals, crisps and snacks. Rice starch is used as thickener in desserts and sauces and for making rice syrup. Ash from Hulls is used for cleaning discolored teeth and making cellulose products such as rayon and rice fuel. Broken Rice Pieces of rice kernels may also be used for manufacturing various products including rice flour and pet foods.

Pakistani rice industry is facing difficulties in reaching to its full potential. One major reason is the low price in international markets which may be attributed to lack of grading, branding and proper packing. Other challenges include non-availability of certified seeds, use of unskilled labour in rice transplantation from nursery, poor post-harvest techniques, higher input prices and lack of modern marketing skills.

11.5. Sugar Industry

In Pakistan, sugar industry is a prominent industry which has witnessed substantial growth. Overtime Pakistan's sugar industry has witnessed sizeable growth and currently, 86 sugar mills are operating in Pakistan. Of these, 46 are located in Punjab, 33 in Sindh and 7 in KPK. Sugar cane and sugar beet are the main sources of raw material for sugar mills (Table 11.1.)

Sugarcane is the main source of raw material for sugar mills. Sugarcane is the cash crop of Pakistan which is primarily grown for obtaining sugar. In 2014-15, the contribution of sugarcane to agricultural value addition and GDP was 3.1 and 0.6 percent respectively. Sugarcane production is

Husk:

- 1- Fuel
- 2- Mulch
- 3- packing material

Rice bran

- i) used in cereals
- ii) Vitamin content

Rice Flour

- 1) Rice pasta
- 2) Snacks

Problems

Table 11.1 Sugar Production in Pakistan

Province	Mills (no.)	Cane Production (million tonnes)	Cane Crushed (million tonnes)	Sugar Produced (000 tonnes)	Recovery %age from cane
Punjab	46	36.04	27.69	2585	9.23
Sindh	33	13.46	13.60	1299	9.42
KPK	7	4.51	3.04	262	8.64
Baluchistan	0	0.04	0.00	0	0.00
Total	86	54.05	44.33	4146	9.24

Source: Govt. of Pakistan, 2013: Agricultural Statistics of Pakistan 2012-13

Although sugar is the main product, the industry produces several other commercial by-products which include molasses, bagasse and press mud. Molasses is a dark brown syrup which is drained during the processing. It plays an essential role in the manufacture of alcohol, rum, yeast and fertilizers. Bagasse is crushed sugarcane obtained after the extraction of juice. It is used for several purposes such as feed for animals, fuel for mills, manufacturing of organic fertilizers, making of hard boards, cartons, chip boards and pulp. The best source of organic fertilizer is the press mud that increases the micronutrients in the soil. It is also sold to the sugarcane growers at a nominal cost that is very useful for fertile soils.

تجیباں

Problem.

The sugar industry is facing several challenges that need the attention of public and private stakeholders for improving the industry profitability. Some of these challenges include underutilization of capacity, low rate of sucrose recovery, political intervention, inadequate credit facility and lack of research and development.

11.6. Maize Processing Industry

Maize is an important food grain crop after wheat and rice in Pakistan. In 2014-15, its contribution to GDP was 0.4% and 2.1% to agricultural value added and its production was 4.695 million tonnes. The maize production is mostly concentrated in Punjab and Khyber Pakhtunkhwa. Maize and its byproducts are used as input by several industries such as human food, poultry and wet milling industries.

Maize as grain provides sufficient starch, vitamins, proteins and minerals. It is an alternative source of food when wheat and rice are not easily available. Baked, roasted boiled maize has mild flavor that can also be used as thickening agent in foods such as jellies and custards. Popcorn is the best example of fluffy kernel that are eaten as snack. The syrup extracted from maize contains high contents of fructose that act as sweetener. Starch extracted is mostly used in confectionery and noodles. Edible oil is also extracted from maize seeds. "Levulinic Acid" derived from maize is used as ingredient in antifreeze process. Ethanol as biomass fuel is also obtained from maize. Stigmas of maize female plants are used as herbal supplements. Maize straw is used as energy source at homes. Maize is also used as animal feed and forage.

Kernels are soaked in water with or without SO_2 to soften the seed in order to soften separate various components of seed.

11.7. Pulses Industry

Legumes commonly known as pulses are the main source of vegetables protein and are component of food in tropical and subtropical regions. Chickpea, lentil, mung bean, black gram and mash are the major pulses grown in various regions of Pakistan. Among legumes, chickpea is the major winter crop that covers 73% of the total pulses under cultivation and mung bean is the major summer crop that covers 18 percent area. Black gram and lentil is grown on 5 percent area of total pulses area.

Both rich and poor communities prefer to enjoy delicate taste of pulses worldwide. The demand for pulses is continuously rising because of tremendous population growth in Pakistan. (The country is deficient in pulses production. That is why, during last decade, 0.336 to 0.52 million metric tonnes of legumes was imported and the imports are continuously increasing.

(Pulses processing industry is poorly developed because it is in hand of few monopolists. High prices are mostly set due to deficient marketing system. Another reason is the increasing focus of government on four major crops and pulses are not accorded significant importance in policies relating to agriculture.

11.8. Fruit Processing Industry

A wide range of fruits such as citrus, mango, dates, apple, guava and banana are grown in various climatic regions of Pakistan. While some of these fruits such as citrus and mangoes are exported, the others are sold in local fruits markets for consumption as fresh or further processing into value added products. The fruit processing industry produces various value added products such as juices, squashes, pulp and jams. Fruit processing industry is one of the largest industries in Pakistan that significantly contributes to agricultural value added. The industry exports premium quality fresh fruits as well and the leading fruit exporters have installed their own processing units for export purposes.)

More than 25 fruit processing industries located in Karachi, Lahore and Peshawar are producing different products including fruit juices, jams, jellies, squashes, pickles, canned fruits and carbonated beverages. The most important feature of this industry is to preserve these products that can be stored at proper time and place for distribution throughout the local and nationwide markets. In Pakistan, production of preserved fruits products is estimated at 15000 tonnes, out of which, 2000 tonnes of jams, jellies and marmalades, 10000 tonnes of pickles and chutneys, 18 million bottles of squashes are preserved.

Existing potential of fruit processing industry is not in match with other industrial developments. (The perishable nature of fruits and vegetables, lack of controlled atmosphere containers, poor transportation facilities, ineffective storage and packaging facilities are the major reasons for this under development of industry.) Share of fruits' export from Pakistan in the world markets is increasing annually that shows that the industry needs to improve the working capacity of already existing

Legum mungo
It is a type
of bean. Also
called wood bean

Problems

11.9. Vegetable Ghee and Oil Industry

Vegetable ghee and cooking oil industry stands among the major agro-based industries in the country. Since independence, the industry has substantially grown. An estimated production of 1.54 million tonnes of edible oil was recorded in 2014-15. Edible oil including vegetable ghee and oil is the essential source of food which is extracted from the oil seeds. In Pakistan, edible oil is extracted from conventional and non-convention oilseed crops. Conventional oilseed crops include cotton, rapeseed, mustard, groundnut and sesame whereas sunflower, soybean and sesame are non-conventional crops introduced in the country to meet the consumers' needs. Since domestic production of edible oil is insufficient, therefore more than three-fourth of the country's requirement are met through imports of mainly palm oil and soybean.)

Table 11.2 Production of Vegetable Ghee and Cooking Oil (000 Tonnes)

Year	Vegetable Ghee	Cooking Oil	Total
2010-11	1,092	312	1,124
2011-12	1,103	323	1,426
2012-13	1,139	363	1,502
2013-14	1,185	375	1,560
2014-15	1,176	368	1,544

Source: State Bank of Pakistan (2015).

The vegetable ghee and oil industry began its journey in the private sector. In 1973, under the nationalization policy, 23 of 26 factories were placed under the control of Ghee Corporation of Pakistan (GCP). However, the industry is now once again operating in private sector because of the privatization policy of the government and is estimated to be comprised of around 160 units which are located in all four provinces of the country.

Various techniques are utilized by the oil industry in Pakistan that bifurcate this industry into three broad groups. Ghani (also known as *chekhu* or *kol*) is the main technology for expelling oil in the villages. Different oil seeds are used in different areas. Factories using intermediate level of technology are located in towns. Oil seeds used are region specific. Large scale sophisticated mills are located in big cities and are oriented towards bigger markets. They also procure oil seeds from a much larger area.

Table 11.3 Import of Edible Oils

Year	Quantity ('000' tonnes)				Value (Million Rs.)			
	Soybean	Palm oil	Other	Total	Soybean	Palm oil	Other	Total
2010-11	66.4	1951.1	158.5	2176.0	5722.2	172702.0	8730.6	187154.8
2011-12	39.5	2108.0	135.6	2283.8	4560.5	211826.2	9309.3	225696.1
2012-13	60.3	2163.8	97.8	2321.9	7157.9	189618.0	6240.4	207660.1

Source: Govt. of Pakistan (2013)

oilseed crops and higher dependency on imported edible. Due to this, the performance of industry is negatively affected. Since edible oil imports mainly comprise of palm oil which is the lowest in quality among various edible oils. Often higher international prices also result in higher local prices of edible oil. As a results, consumers have to consume high priced and low quality edible oil products.

11.10. Dairy Industry

Dairy farming in recent year has emerged as a major agro-based activity and buffaloes and cows are growingly raised in an organized manner for milk production for commercial purposes. Pakistan stands among major milk producing countries of the world with a production of 52632 thousand tonnes in 2014-15.

Milk is consumed in various ways such as for making tea, yogurt, butter, desi ghee, khoya and various sweets, in addition to be consumed as fresh. Milk processing companies transform raw milk into pasteurized milk, UHT milk, milk powder, condensed and skimmed milk. A wide range of value added products including ice-cream, creams, drinks, cheese, and desserts are also made using milk as basic ingredient.

Ultra High temperature processing.

Urban areas are the major markets for the sale of milk because of changing consumer preferences. Although sale of fresh milk still dominates, the demand for processed milk is gradually growing. This growing demand has attracted many national and international companies to invest in this sector and supply good quality processed milk in markets. Currently Nestle, Engro, Haleeb, Gourmet and Adams are some of the major milk companies in Pakistan

Currently, more than 17 milk processing plants including UHT and pasteurization units are operating in the country with huge potential for growth. Unfortunately, all these dairy units are working below their production capacity. Low animal productivity, poor animal hygiene, lack of water availability, poor animal breeding techniques, smaller herd size, unbalanced animal feed and seasonal milk supply are the major hindrances in dairy industry.

Consumer preferences and taste are some factors affecting growth of processed milk market in the country. In spite of many complaints on quality of fresh milk, most of the consumer still prefer to consume fresh milk as compared to processed one. Another issue is the availability of processed milk only in big cities of the country. Perhaps the most important hurdle in adoption of processed milk is the price difference between processed and fresh milk. On an average there exists a price difference of around 40 Rs/liter between the two types of milk. So majority of the consumers do not afford such high price. Considering the demand for quality milk in the country there is dire need to introduce more...

11.11. Poultry Industry

Poultry industry has emerged as a prominent and vibrant industry in Pakistan because of 8-10 percent annual growth in the recent past. It is considered one of the organized agro-industries with a current investment of more than Rs. 200 billion. In 2014-15, poultry industry contributed 1.3 percent to GDP and 6.3 percent and 11.2 percent to agriculture and livestock value added. The industry directly and indirectly provides employment to 1.5 million people.)

In Pakistan, the development of poultry industry on commercial basis started in 1960s when government realized the white meat needs of rising population. The first commercial farm was setup in 1962 by Canada's Messers Shaver's with the help of PIA (Pakistan International Airline), resulting in PIA Shaver. The poultry industry witnessed a period of stability in the late 1990s when producers started earning profit. In the last few years, the poultry industry attracted sizeable investment and the industry is gradually shifting from traditional open houses to semi and completely automated and controlled poultry houses. Currently, there are around 28,000 commercial poultry farms and 150 feed mills with the capacity to produce 2.821 million tonnes of compounds feed per annum are operating in the country.

Though it is now fairly spread around the country, the poultry industry is mainly concentrated around the major cities of Punjab and Sindh provinces. In Sindh, poultry farm are mainly located in Mirpurkhas, Sukkur, Nawabshah and in some other small cities. In Punjab, the poultry farms are based on Lahore, Faisalabad, Rawalpindi, Multan, Rahim Yar Khan, Bhawalpur and Mianwali.

Due to relatively limited supply of mutton and its high prices, there is fair margin for the promotion of poultry meat in the country. The contribution of poultry meat in total meat production is 28 percent in the country. One phenomenal factor in the supply chain of poultry meat is the existence of fluctuating trend in supply and prices which mainly is driven by demand forces. Sometimes the prices shoot up due to limited supply whereas prices depressed to lowest at some other times. Such fluctuations have caused many investors to leave their businesses.

Now a days, poultry industry has experienced a positive change in the form of Environment Controlled Poultry Sheds. Some big companies have entered in this business which have controlled supply and mainly determine the prices in the country. This initiative has pushed many small investors out of this business. At the same time some big companies like K & N, MENU, SUFI etc. have developed their own supply chains which ends up with value added products like processed meat, semi-cooked and cooked poultry meat products. These companies are selling through retailers and also have established their own outlets in big cities of the country. This industry faces some challenges like outbreak of bird flu and related changes in consumer food preferences which results in drastic reduction in poultry meat consumption.

enough raw material for leather industry (53 million number of skins and 15 million number hides). Leather exports stand at number three after textiles and rice in Pakistan. Overall, in 2015 leather exports declined in spite of increase in the prices. Exports of tanned leather remained 408 million dollars whereas leather garments exports were 498 million dollars in 2015. Pakistani leather exports are valued reasonably well in international markets. /

Leather industry is divided into six sub-sectors which include tanning, leather foot wear, leather garments, leather gloves, leather shoes uppers and leather goods. Availability of skins and hides is an added advantage in Pakistan which other countries especially developed ones do not enjoy. As such exports from developed countries are declining and providing a fair chance for increasing exports of leather products from Pakistan.

Over the years, Pakistan's export performance in leather exports has improved but still there is need to improve the quality especially in view of stringent international requirements and standards. One famous allegation on leather industry is the damage this industry is causing to environment. In addition lack of export promotion is another factor causing challenges to leather industry in Pakistan. Trade Development Authority of Pakistan should come ahead and arrange fairs and exhibition showing rest of the world quality and variety of leather products. One important step which needs to be implemented in this regard is the research and development on critical issues facing the leather industry in the country to find out the solutions.

Leather industry in Pakistan is facing many challenges as well. Quality of skins and hides is an issue which needs to be addressed. Traditional system of slaughtering causes cuts and bruises and poor system of storage causes fungus contamination. At the same time availability of skilled labour is another issue for leather industry. Some other major obstacles include lack of modern technology and market research, complex system of export, energy crisis and lack of promotional activities. 2/2/18

11.13. Tobacco Industry

Tobacco industry covers mainly three products viz. hukkah tobacco, cigarettes and naswar (Snuff or chewed). However from the market point of view, major share comes from cigarette tobacco. Different types of tobacco such as flue-cured, light air-cured are used in manufacturing of cigarettes, while, light sun-cured is primarily used in hukkahs. Dark air-cured, semi-oriental and dark sun-cured are utilized in the production of biri, cigarettes, chewing and naswar. Tobacco as cash crop is cultivated in Multan, Lahore, Bahawalpur, Khairpur, Peshawar and Baluchistan. Primary production of tobacco crop is followed by secondary operations i.e. curing (graded tobacco) in kilns, storing, aging, blending, casing, cutting and flavouring. Afterwards, cigarettes are filled in paper through advance technology, packed and distributed to local and distant markets. Currently, capacity of 123 billion pieces of cigarettes is produced in Pakistan.

11 Agro-Industries in Pakistan

In Pakistan, tobacco processing started in 1951. Since then, two main companies Pakistan Tobacco Company (PTC) and Phillip Morris (PM) Tobacco Company and many small and medium enterprises are involved in the growth and development of industry. Pakistan Tobacco Board (PTB) is the regulatory authority of its production, marketing and pricing mechanism. Contractual agreement is signed between PTC and PM and large growers on the fixed price supported by PTB. Small growers don't follow such type of agreement and sale their produce directly to local buyers or contractors. Without any contractual agreement, few exporters purchase tobacco directly from growers on cash or credit basis.

Heavy taxes such as Central Excise Duty (CED) and General Sales Tax (GST) are imposed on tobacco industry as such this is a good source of revenue for government. Specific financial provisions are absent to meet the needs of key stakeholders who are directly or indirectly involved in its crucial operations i.e. production, curing, transportation, storage, processing, packaging and marketing. Therefore, there is dire need to formalize the formal credit system in this industry. Trend of landless production is the major constraint in this financial system, because people use rented land for its production and mostly rely on illegal financial sources. Market risk is also another hindrance due to natural hazards such as hailstorm that underpin the supply of tobacco.

11.14. Tea Industry

In Pakistan, tea is popular beverage and widely consumed in social and professional gatherings. It is also an integral component of daily meal in Pakistani culture. Currently, in domestic market, two types of tea i.e. branded and unbranded (loose) are available which are mostly imported from Kenya, Bangladesh, Indonesia, Sri Lanka, Uganda and Rwanda. First category is imported in loose packing and the second category is packed and is sold in the market with famous brand names.

Until 1970, Pakistan was a bulk producer and exporter of tea. However, after the separation of eastern wing tea is one of the major import item because all domestic requirement of tea is met from import mostly from Kenya. Pakistan has to spend substantial amount of foreign exchange reserves on import of tea.

The growth of tea industry is not as fast as the population is growing. Since last few decades, per capita consumption of tea is approximately 1 kg that is not increasing. Large blender packers who sell under brand name mainly control tea trade in Pakistan. In addition, there are large number of importers, wholesalers and retailers who provide wide variety of tea to consumers in Pakistan.

11.15. Seed Industry

Seed is the basic input that has a key role in improving agricultural productivity. The seed industry in Pakistan comprises of public and national, regional and international public private companies and business associations that are directly or indirectly involved in the production, processing, marketing and distribution of seeds. Mostly

seed processing plants owned by public and private sector are located in Punjab and Sindh provinces.)

Private sector induction in seed business started in the 1980s with formal registration of the first seed company in 1981 followed by another eight seed companies in Punjab in the following years. Formally, the seed business was declared open in 1994 and subsequently, the seed industry attracted lot of foreign direct investment. Several multinational companies entered in seed business. Monsanto started its business in 1984, Pioneer Seeds in 1989, Syngenta in 1991 and ICI Pakistan in 1998. The number of seed companies consistently grew and in 2012 the number of registered companies reached to 963.

Formerly Seed Act of 1976 was the basic legal document to govern the seed production and trade. The Seed Act 1976 law failed to fulfil the requirements of a 'modern seed industry' and therefore new Seed Act 2015 has been introduced. This has made it mandatory for farmers to buy seeds from a licensed company or its agent and that they had to do so every time they cultivate a new crop. Under this law, farmers would be fined and imprisoned for preserving, selling and exchanging seeds, a tradition that has been in vogue for centuries.

Initially, Pakistani seed companies were limited to multiplication of basic seed obtained from seed corporations. Now, they have initiated their own variety development programs and are able to bring a number of new crop varieties in the market. As result of expansion in their operations, these companies have gradually started replacing public sector corporations from the market. Some companies are now lead providers of seed of several crops including cotton, maize, oilseeds, vegetables and fodders. Seed production and marketing activities are also performed by local farmers and traders which is referred as unauthorized or bazaar seed. Majority of seed supply is provided by this sector.

The performance of seed industry in Pakistan is considered low because of malpractices and inefficient policies. Numerous challenges faced both by the public and private sector are the major hurdles in the development of industry. Seed processing capacity is inadequate to meet the requirement. Companies lack adequate modern storage facilities that affect the quality of seeds.

11.16. Fertilizer Industry

The fertilizer industry provides the key input fertilizer which contributes 30 to 50 percent in crop production. Currently, 9 urea manufacturing plants, 1 Diammonium Phosphate (DAP), 3 Nitrophos (NP), 3 Single Super Phosphate (SSP), 2 Calcium Ammonium Nitrate (CAN) and 1 plant of blended Nitrogen Phosphorous Potassium (NPK) are operating in Pakistan. The total production capacity of these plants is 8,983 thousand product tonnes per annum. However, the actual production is 25 percent less than the installed capacity which may be attributed to the curtailment of gas to the industry because of energy crisis in the country.)

Fertilizers in Pakistan were introduced in the 1950s through imports. In the early 1960s, the government started building domestic fertilizer industry because of abundant

gas supply to the sector and the import-substituting industrialization policy. As a result, the national supply of fertilizers gradually increased and dependence of fertilizer imports declined. However, the imports of those fertilizer which did not require gas in production process continued. Use of high yielding varieties after 1970 further accelerated the fertilizer use in agriculture.

Currently, the fertilizer industry comprise of several firms including Fauji Fertilizers Company (FFC), Engro Fertilizer Limited, Fatima fertilizer, Pak-Arab, Dawood Hercules and Agri-Tech. These companies are trying to provide required amount of fertilizer in the market but some inherent problems in the marketing system and vested interests of market intermediaries cause shortage and hike up the prices. Farmers often complaint about high prices and shortage of fertilizer at the time of need in farming operations. Quality of these fertilizer is another issue which needs immediate attention of regulatory authorities.

11.17. Farm Machinery Industry

Pakistan's farm machinery industry supplies large variety of agricultural implements and machinery including tractors. The industry produces a wide range of farm implements and machinery for various agricultural, horticultural and forestry related operations. Some of these includes ploughs, disc harrows, laser levelers, seeders planters, seeding drills, rotary tillers, harvesting implements and threshing machinery.)

Small enterprises dominate the farm machinery manufacturing. These enterprise operate in the form of small workshops and use locally produced conventional machinery in their operations. The industry is mainly located at Mian Channu (Khanewal), Daska, Gujranwala, Paisalabad, Multan and Rahim Yar Khan.

The industry serves mainly the need of local market. The industry is facing issues which hamper its growth. Some of these include lack of standardization and quality, low skilled labour force, low quality compared with imported machinery, unawareness about modern manufacturing practices and performance standards of equipment produced, untrained and use of old and obsolete technology.

11.18. Pesticide Industry

Agrochemicals and pesticides are broadly classified in terms of target pests and type of disease or fungus attack, of which main categories are insecticides, herbicides and fungicides. However amongst these, pesticides share the dominant proportion in total market value of this group. Enterprises of agrochemical (pesticide) industry may be classified into three broad categories that include multinational corporations, well established domestic input companies with diversified marketing network and local traders of the wholesale markets.

Punjab is the leading province in terms of pesticides use followed by Sindh, KPK and Baluchistan (Khan, 2000). Over the time the trend of quantity and value of pesticides use has increased and this is regarded by many scientists as one of the

factors affecting agricultural productivity positively by reducing the chances of pest attack. However another school of thought declared it as ethical offense because intensive pesticide use has also enhanced resistance power amongst pests which has increased the problems for farmer. Same is happening in case of herbicides and fungicides. Cotton is major cash crop which alone shares around 70% of pesticide consumption in the country (Tariq, 2002).

Registration of pesticides is practiced under Agricultural Pesticides Ordinance 1971 which regulates the quality check of pesticides. Punjab assembly has passed the Agricultural Pesticides Act 2012 but its implementation is still awaited. Directorate of Pest Warning and Quality Control of Pesticide under the Ministry of Agriculture in Punjab is the main regulatory body which not only inspect and control the quality of pesticides but also spread awareness about their usage. At present in Punjab, there are 416 registered distributors/companies of pesticides.

In the past, there were various structural barriers which worked as impeding factors to de-motivate the new investors. One of these factors includes lengthy process of companies' ordinance for registration process that took up to three years for issuing of license. This issue was solved up to some extent due to introduction of generic scheme and fast-track registration procedures. This generic policy was announced in 1980's to regulate import and marketing of pesticides through various domestic companies. Various multinational companies also got benefits from this opportunity and established their businesses in Pakistan. Local wholesalers/ distributors of pesticide also contribute in highly competitive environment by marketing of generic products but their operations are limited in small towns or rural markets due to insufficient access of finance. Majority of the companies are importing chemicals and making their products using various combinations but few have established their own manufacturing facility. Limited access in national market, financial barriers and legislative restrictions are some of the reasons for not establishing national manufacturing plants in Pakistan. However, with the passage of time, the importers and multinational companies are able to effectively market their imported pesticide products in the domestic market and reaped the benefits of phenomenal margins from the last decade. This industry is facing many challenges including loose quality control, strict government regulations, increasing number of pesticide companies and enhancing default rate of stakeholders.

Conclusion

Agro-industries in Pakistan are playing an important role in the development of Pakistan's economy by providing market to producers for their agricultural produce and consumers with their food demands. Overtime, these industries have substantial expansion in terms of number and production/processing capacity. There is dire need of further strengthening of these industries because it is commonly held belief that agriculture nowadays cannot be developed without value addition of agricultural commodities. To this end, the role of agro-industries is very important. In Pakistan, agro-industries are facing several challenges which hinder their growth potential. Both public and private sectors need to pay adequate attention to overcome these challenges.