

2 Real Sector

2.1 Agriculture Sector Performance

Recent information points to an increased risk of a decline in aggregate value-addition by important major crops in FY08 relative to the previous year. It was hoped that a wheat harvest close to the annual target would offset much of the drag from the disappointing aggregate performance of the FY08 *kharif* harvest. But some reports suggest that wheat production in FY08 may also turn out to be substantially below target. If these concerns prove correct, then the value

Table 2.1: Estimation of Value Addition by Four Major Crops

	Real value addition (billion rupees)		percent growth
	FY07	FY08	
Rice	55.6	56.8	2.2
Cotton	93.8	84.8	-9.7
Sugarcane	44.5	50.6	13.9
<i>Kharif</i> sub-total	193.9	192.2	-0.9
Assumed wheat harvest (million tons)	Value addition in FY08		Growth by 4- major crops
	Wheat	Major crops	
22	147.5	339.7	-3.3
23	154.2	346.4	-1.4
24	160.9	353.1	0.5

addition by major crops would be negative during FY08 despite a record high sugarcane harvest (see **Table 2.1**). While the sector, on the whole, may post positive growth on the back of anticipated strong performance in livestock and minor crops, dismal performance by major crops would drag the annual growth substantially below the annual target.

The disappointing harvests of key cash crops are particularly troubling for Pakistan. What is worrisome is the fact that domestic producers could not take advantage of the incentive offered by record international prices for many agri-commodities, such as rice and wheat. Pakistan is a low-cost producer of many such commodities, and could, therefore have benefited substantially if productivity growth and output had remained strong.

Given that commodity prices are likely to remain strong, it is imperative that policies be framed to support farmers' ability to raise productivity substantially in the years ahead. Key areas requiring policy intervention remain the transmission of price gains (establishment of futures markets), risk mitigation (crop insurance, storage facilities), increasing investment in agri-sector infrastructure (water management, electricity, farm-to-market roads, etc.) and in value-addition chains (e.g. through processing).

Increased production of agri-commodities not only raise farm incomes and help reduce poverty (particularly as landless farmers' share in the crop), but also help narrow the country's current account deficit (through import substitution and higher exports), as well as help contain domestic inflation.

Table 2.2: Performance of Major Crop

Area under cultivation (000 hectares)						
Crops	FY06	FY07 ^T	FY07 ^P	FY08 ^T	FY08 ^E	% change in FY08 over FY07
Cotton	3,100	3,072	3,248	3,250	3,055	-5.9
Sugarcane	907	1,005	1,029	1,040	1,147	11.5
Rice	2,621	2,575	2,581	2,594	2,515	-2.6
Wheat	8,448	8,459	8,578	8,578	8,410	-2.0
Gram	1,029	1,051	1,074	1,120	-	-
Maize	1,042	1,001	1,038	1,001	1,055	1.6
Production (000 tons; cotton in 000 bales of 170.09 kg each)						
Cotton	13,019	13,820	12,856	14,140	11,655	-9.3
Sugarcane	44,651	50,500	54,871	55,871	62,300	13.5
Rice	5,547	5,693	5,439	5,721	5,559	2.2
Wheat	21,277	22,000	23,295	24,045	-	-
Gram	536	707	848	707	-	-
Maize	3,110	3,279	2,907	3,221	3,248	11.7
Yield (Kg/hectare)						
Cotton	714	724	720	740	649	-9.9
Sugarcane	49,229	50,249	53,325	53,722	54,316	1.9
Rice	2,116	2,211	2,107	2,205	2,210	4.9
Wheat	2,519	2,601	2,716	2,803	-	-
Gram	521	673	790	631	-	-
Maize	2,985	3,276	2,801	3,218	3,079	9.9

Source: MINFAL

2.1.1 Crops

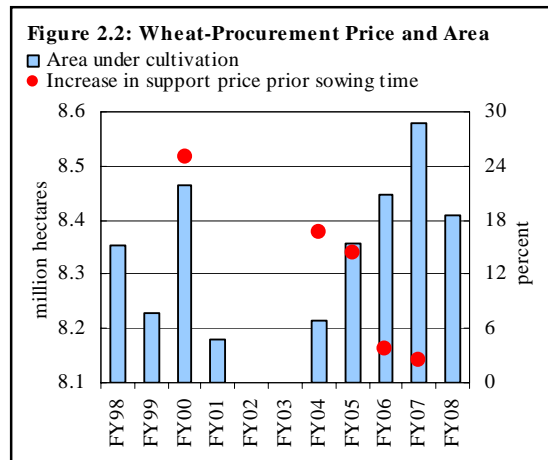
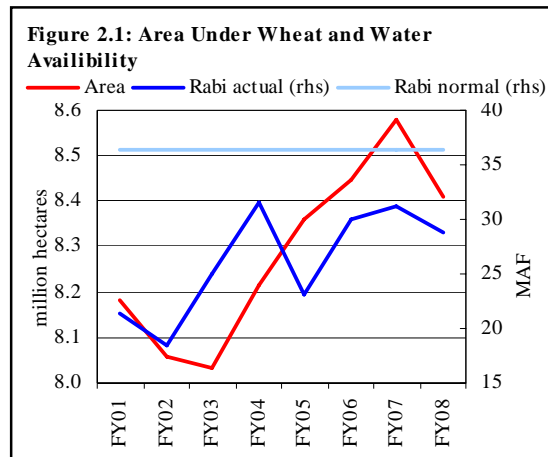
Wheat

Absence of the customary benchmark procurement price for wheat at sowing time in FY08 alongwith rising prices of fertilizers as well as delayed sugarcane crushing and extended cotton picking caused a reduction in area under wheat crop (see **Table 2.2**). Additionally, anticipated decline in water availability at the time of sowing discouraged farmers to bring more area under wheat cultivation (see **Figure 2.1**). While wheat crop benefitted from cold spell and winter rains at the initial stages, improvement in yield could not be realized due to stubbornly high prices of fertilizers, particularly DAP. Also, in some areas, wheat crop was partially damaged due to rains and hailstorms in early April 2008. Farmers

associations and government agencies estimated wheat crop size at around 21.8 million tons for FY08 compared with 23.3 million tons harvested last year.

This situation necessitates radical policy changes in incentive signals and market structures as well as development of infrastructure to increase productivity and reduce wastage. It is important to note that supportive policies and enabling environment have a positive impact on productivity (see **Box 2.1**). For example, cultivated area under wheat had almost always positively responded to announcement of rise in procurement prices before sowing period (see **Figure 2.2**). A market based solution may also be introduced by establishing forward markets, crop insurance and contract enforcement mechanism. The market then would be able to explore the equilibrium price by incorporating all information contents of domestic as well as international factors.

Thus, farmers would have price benchmarks available at sowing time. In turn, government may also withdraw subsidies on fertilizer, electricity tariff etc. In contrast, the government's supportive role is required in facilitation of the working of markets as well as providing necessary infrastructure to ensure timely deliveries as well as to reduce post harvest wastages.¹ For instance, estimated wastage in



¹ Shamsher Khan (May 2007) paper is available at <http://www.reliefweb.int>

case of wheat is estimated at approximately 10 percent of the total production (see **Box 2.2**).

Other Crops

The maize harvest is higher by 11.7 percent during FY08 principally due to improved yield. Similarly, production of mung pulse also recorded a rise of 10.9 percent, despite a below target area under the crop. However, while heavy winter rains and cold weather were beneficial for wheat and other crops, gram and sunflower crops suffered due to frost and rain during their initial growth stages.

Anecdotal evidence suggests that the output of most of vegetables and fruits increased significantly during FY08. Thus, growth in minor crops is likely to be strong.

Box 2.1: A Paper² on the Policy Impacts on Long-term Agricultural Growth

A comprehensive study on Long-term Agricultural Growth and Agricultural Policy in India and Pakistan explored the performance of agriculture in the two regions (Pakistan & India) between 1900 & 2000 and associated it with changes in political institutions and agricultural policies. The study examined the growth records of agriculture production and changes in crop mix indices, which showed that institutional and policy changes have significant effects on agricultural growth in this region. The study concludes that farmers have responded to these changes, adjusting their crop mix and production technology. Growers have also responded to the changes in market conditions so that they not only adopted new technology with high-yielding potentials but also adjusted their land allocation toward high value crops. The study suggested that liberalization, deregulation and, privatization policies in agriculture in these countries led to an increased role of crop shifts in enhancing aggregate land productivity. The study further observed that the sustained growth during the post-colonial period was achieved when substantial public investment was implemented. With reduced public investment without simultaneous improvement in investment efficiency, the boom experienced during the 1990s in response to newly opened opportunities would not last long. The importance of production-oriented infrastructure in increasing productivity of agriculture and in reducing rural poverty cannot be overemphasized (Hayami 2003). Rather, considering the public-good nature of such investment, its importance should rise under the context of globalization and trade liberalization.

Box 2.2 Post Harvest Losses:

Improper postharvest handling of agriculture produce results into quantity and quality losses in addition to rise in consumer prices. These losses bring low return to growers, processors and traders and country also suffers in terms of foreign exchange earnings. Therefore, such losses cost in billions of rupees which could be avoided and can result in ensuring supply of sufficient food.

Postharvest loss in cereal, fresh fruits and vegetables is the result of disorders and infectious diseases, which varies greatly among commodities, production areas and seasons. Main causes of this loss, both in term of quality and quantity, are the result of stress related to excessive or insufficient heat or cold, improper mixtures of environmental gases (such as oxygen, carbon dioxide

² by Takashi Kurosaki: (December 2003), paper is available at www.gdnet.org/pdf2/gdn_library/annual_conferences/fifth_annual_conference/kurosaki_paper.pdf

and humidity), poor nutrients and inadequate storage and transportation facilities. Further, loss may be caused by mechanical damages (such as bruising, cutting, excessive pooling or trimming). All these factors are not caused by disease organisms; however, these factors often weaken the natural defenses, especially of fresh produce, making it more susceptible to biotic diseases those that are caused by disease organisms.

Worldwide average food grain losses have been put at 5%. In the developed countries, losses have been generally at 1% while 10-30% losses have been reported for developing countries. However, worldwide post harvest losses in case of horticulture ranging between 30-35%, are comparatively high with less difference between developed and developing countries³ (see **Table 2.2.1**).

Table 2.2.1: Comparison of Cereals Oilseeds and Horticultural Crops

Cereals and oilseeds	Horticultural crops
Post harvest loss worldwide 5%	Post harvest loss worldwide 30-35%
Losses in <ul style="list-style-type: none"> • LDCs 10-20% • Pakistan 8-12% • India 10-15% • US 1-2% 	Losses in <ul style="list-style-type: none"> • LDCs 15-50% • Pakistan 35-40% • India 30-40% • US 20-23%
Low moisture contents, typically 10-20 %	High moisture content, typically 70-90 %
Small unit size, typically less than 1 gram	Large unit size, typically 5 oz to 5 kg
Very low respiration rate with very small generation of heat	High to very high respiration rate
Heat production is typically 0.05 mega joule/ton/day for dry grain	Heat production is typically 0.5 -10 mega joule/ton/day at 0°C to 5 to 70 mega joule/ton/day at 20°C
Hard texture	Soft texture, easily bruised
Stable, natural shelf life is one to several years	Perishable, natural shelf life is a few days to several months
Losses usually caused by molds, insects and rodents sprouting, and bruising	Losses usually caused by rotting (bacteria, fungi), senescence

In Pakistan, out of 13.67⁴ million tones of fruits and vegetables produced annually, it is estimated that about 35-40 percent goes to waste, losses varying from 6% each in almond and walnuts, to more than 50% in case of cherry, Mulberry and apricot⁵, while 4 percent of exported horticulture of the country fetch 41 percent lower prices as compared to world average price due to below standard post harvest management. In India, this loss of fresh fruit and vegetable accounted for 40 percent. However, the loss in developed countries like US is not more than 25% (including plate waste: food not consumed by the purchaser)⁶.

Post harvest loss in food grain production of Pakistan is, thought to be between 8-12 percent ranging from 10 percent in wheat to 15 percent in rice. Insect and mites cause 40-70 percent of the total post harvest loss in food grain depending on the type of food stored and pest involved. Similarly, other

³ <http://postharvest.ucdavis.edu/datastorefiles/234-528.pdf>

⁴ http://www.dailytimes.com.pk/default.asp?page=2008\03\18\story_18-3-2008_pg5_8

⁵ http://www.apo-tokyo.org/00e-books/AG-18_PostHarvest/AG-18_PostHarvest.pdf

⁶ <http://postharvest.ucdavis.edu/datastorefiles/234-528.pdf>

major crops like cotton and sugar are also exposed to significant postharvest losses. In case of fish, 10-15% of total catch go in to waste due to long voyage time and handling of fish catch on board (not including discard at sea)⁷.

However, it is not economical or practical to aim for 0% losses, but an acceptable loss level for each commodity production area and season combination can be identified on the basis of cost-benefit analysis (return on investment evaluations) to ensure food requirement in the era of severe food scarcity.

2.1.2 Irrigation Water

The water shortage seen in *rabi* FY08 are likely to continue in *kharif* FY09⁸ (see **Table 2.3**).⁹ The carryover water balance for *kharif* 2008 from the ending *rabi* season was a negligible 0.013 MAF at Tarbela, Mangla and Chashma as on April 1, 2008. Carryover water balance was 1.5 MAF during the beginning of the corresponding *kharif* period. The water shortage is likely to impede sowing of the two major *kharif* crops - rice and cotton.

Indus River System Authority (IRSA) has estimated a 7.0 percent shortage for the first phase of *kharif* FY09, with the minimum daily average of only 5,100 cusecs available for Punjab and 3,500 cusecs for Sindh. Water shortages at the sowing time may lead to delay in sowing and shortfall in area under cultivation relative to target. It is important to note that delayed sowing results in lower yields.

Table 2.3: Water Availability
million acre feet (MAF)

Province	Kharif FY08		Kharif FY09
	Anticipated	Actual	Anticipated
Punjab	36.9	37.7	35.8
Sindh	33.6	30.3	32.7
Balochistan	2.5	1.7	2.5
NWFP	0.8	1.1	0.8
Total	73.9	70.8	71.9
Net (minus NWFP+Balochistan)	67.2	65.7	64.7

Source: IRSA

Water availability during the second phase of *kharif* FY09 (June 10-September 30) would largely depend upon monsoon rains in the catchment areas as well as the conducive high temperatures in the glacial belt- enough to precipitate the melting process. At present, water shortage for the full *kharif* season has been estimated at 3.7 percent relative to normal requirements for the season and 1.6 percent lower compared with the water availability during the preceding *kharif* season.

⁷ http://www.nio.org/past_events/fisheries/session_II.jsp

⁸ From April 1, 2008 to September 30, 2008.

⁹ The sowing is undertaken in the first phase of *kharif* season that starts from April 1 and ends on June 10.

In contrast to predictable water availability in a canal fed area, water availability in barani areas is entirely dependent on rains. Therefore, yields of various crops are also based on the volume and timings of the rains in these areas. Asian Development Bank (ADB) has extended a loan to improve irrigation and drinking water facilities across the Potohar Plateau near Islamabad (see **Box 2.3**).

Box 2.3: Multiple Water Projects - Pakistan: Pakistan is to build multipurpose dams, irrigation canals, and drinking water supplies across the Potohar Plateau near Islamabad with US\$75 million loan provided by the Asian Development Bank (ADB). The project will improve the livelihoods of about 22,000 farming households by bringing irrigation to 11,500 hectares of agricultural land that used to rely on irregular and unpredictable rainfall, as well as improving existing irrigation networks across another 10,000 hectares. The project will also increase supplies of water for domestic use to rural communities and small towns in Punjab province's districts of Attock, Rawalpindi, Jhelum, and Chakwal.

ADB rural development specialists believe that without secure water sources, farming in rain-fed 'barani' areas usually have low productivity and carry high risk because crops often fail when there is drought. Farming is the traditional source of livelihoods across Potohar, but crop yields in the "Barani" areas have been typically less than half of those in areas with river-fed irrigation. The traditional crops in *barani* areas are wheat and gram in winter and sorghum, millet, groundnuts or maize in summer when rainfall is sufficient.

This project will give farmers a reliable water supply, which will increase crop and livestock productivity and therefore increase people's incomes. At the same time, it will increase households' access to cleaner water, therefore reducing sickness and mortality rates caused by waterborne diseases. The construction of dams across the Potohar Plateau started as early as the 1960s. But they were not as beneficial as had been hoped because local communities rarely participated in their development, farmers did not get the financial and technical support necessary to switch from rain-fed agriculture to irrigated farming, and there was no watershed management resulting in a high reservoir sedimentation rate.

In this new project, a more holistic approach is being used that is simultaneously looking at upstream watershed management and downstream irrigated area development. It will also involve local communities to ensure the project is demand driven. Out of the total loan package, \$20 million will be concessional and will carry low interest rates, while the balance of \$55 million will be provided from ordinary capital resources under ADB's London interbank offered rate-based lending facility.

2.1.3 Fertilizer off-take

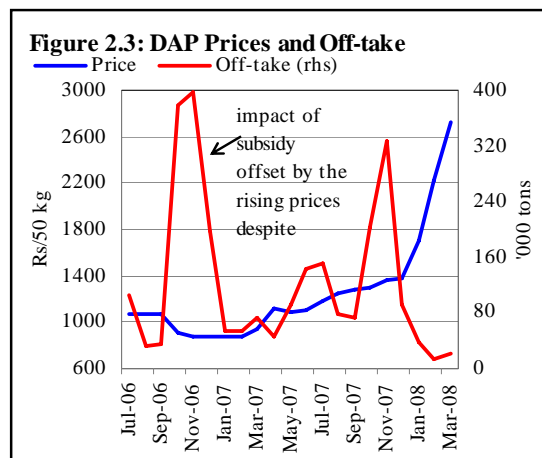
The increased fertilizer off-take during July-March FY08 (see **Table 2.4**) was entirely due to an exceptional rise in urea demand that significantly offset the decline in DAP off-take in this period. The strong growth of urea off-take is a combined impact of a depressed base as well as substitution for DAP (as the international prices rose sharply).

Domestic requirements of DAP are met by importing about 70 percent of DAP, therefore the rise in international prices of DAP have also translated into domestic prices. As a result, the DAP off-take in Jul-March FY08 decreased by 25 percent compared with 13.8 percent rise in the same period of FY07. The impact of price effect is more evident in the second and third quarters of FY08, when DAP prices rose sharply and drop in its off-take was also more pronounced (see **Figure 2.3**).

A continuous increase in fertilizer prices is another source of concern (see **Box 2.4**). To increase the productivity in agriculture sector, there is a need to provide shelter to the farmers against the rising fertilizer prices. Since, the risk appetite of small farmers is limited and they are unable to invest heavily in agri inputs, there is possibility of a further decline in fertilizer off-take, if fertilizer prices would continue to follow a secular rising trend. This would lead to a decline in yields and degradation of soil quality due to a possible implementation of inappropriate mix of the nutrients.

Table 2.4: Fertilizers Off-take (Jul-Mar)

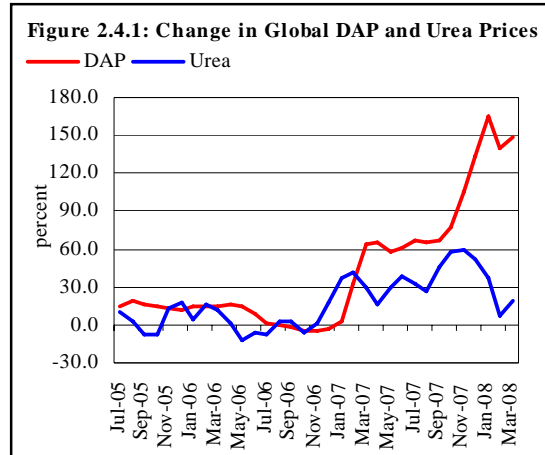
Growth (%)	FY06	FY07	FY08
Urea	6.1	-15.5	22.1
DAP	3.8	13.8	-25.0
Total	5.6	-9.1	9.2
Growth (in percent)			
Q1	0.4	-24.2	27.3
Q2	2.0	17.6	-13.9
Q3	18.6	-23.4	41.1



Box 2.4: Fertilizer Prices

Fertilizer prices are surging upwards around the world, causing decline in yields and income of farmers. International fertilizer prices rose steadily from 2004 through 2006 -then urea prices jumped by 41 percent in March 2008 relative to July 2007. The increasing trend in the price of urea since the start of 2007 did see a temporary reversal in Dec-Feb FY08, but resumed thereafter. DAP prices rose by 140 percent between January 2007 and March 2008 (see **Figure 2.4.1**), mainly denoting increases in prices of its essential raw material i.e. phosphoric acid and phosphate rock.

Main reasons for the enormous rise in the fertilizer price include: (1) bio-fuel- diverting farming land to energy crops, requires more fossil fuel, (2) additional land was brought under cultivation, (3) increase in freight charges, (4) rise in insurance rates, (5) increase in gas/energy prices (fertilizer is extraordinarily energy intensive), (6) increased per capita incomes in China, India, Brazil and other emerging economies, resulted in strengthening demand for grain-fed meat and dairy products, and (7) population increase (about 70 million people are added in the world per annum).



FAO¹⁰ projected that global fertilizer consumption and supply to grow by 1.7 percent and 3.0 percent respectively upto 2012. Thus global supply of fertilizer is expected to fall short of demand. However, the global fertilizer supply constraints will start easing after 2010, when enhanced fertilizer industry by Gulf countries will start production.

2.1.4 Agriculture Credit

Agriculture credit disbursement continued apace with its positive trend. The total agri disbursements amounting to Rs 157.6 billion were achieved during July-April FY08 - an increase of 34.9 percent YoY (see **Table 2.5**). A part of this increase in the credit disbursements to farm sub-sector was attributed to rising prices of fertilizers and pesticides. The credit off-take in non-farm sub-sector also accelerated.

It is important to note that while commercial banks lending is more focused on production loans, specialized banks are supporting lending for developmental purposes. This is also evident during Jul-April FY08 numbers that rise in the developmental loans by ZTBL has partially offset the decline in these loans by the commercial banks. Since production loans are extended for a short period, the recovery ratio on such loans is better. This fact is also reflected in a higher growth of recovery by the commercial banks.

¹⁰ FAO World Fertilizer Trend and Outlook 2011-12.

Table 2.5: Agriculture Credit (July-April)

billion Rupees

	Disbursement				Recoveries			
			percent change				percent change	
	FY07	FY08	FY07	FY08	FY07	FY08	FY07	FY08
Commercial banks	72.5	107.8	11.7	48.6	67.1	102.8	26.4	53.2
Five large commercial banks	54.5	74.3	3.5	36.1	52.7	74.7	21.5	41.5
Domestic private banks	17.9	33.5	47.1	86.9	14.3	28.1	48.8	96.2
Specialized banks	44.3	49.7	20.7	12.2	39.8	45.2	16.6	13.3
ZTBL	38.8	45.7	19.6	17.8	35.6	40.9	19.8	14.7
PPCBL	5.4	3.9	29	-27.1	4.2	4.2	-1.2	1.0
Total	116.8	157.5	14.9	34.8	106.9	148.0	22.8	38.4
	Production loans				Developmental loans			
			percent change				percent change	
	FY07	FY08	FY07	FY08	FY07	FY08	FY07	FY08
Commercial banks	63.6	100.4	20.9	57.9	8.8	7.3	-27.8	-17.0
Five large commercial banks	47.7	70.3	12.8	57.8	6.8	4.0	-34.1	-41.7
Domestic private banks	15.9	30.1	53.4	88.9	1.9	3.3	10.1	70.4
Specialized banks	38.5	41.9	19.6	8.2	5.7	7.7	28.7	35.0
ZTBL	34.9	38.7	21.6	10.7	3.8	7.0	4.2	84.2
PPCBL	3.6	3.2	3	8.5	1.8	0.7	151.4	-61.1
Total	102.2	142.5	20.4	39.4	14.5	15.0	-12.6	3.4

2.1.5 Crop Outlook FY09

Farmers are expected to bring more area under *kharif* crops, implement quality inputs in appropriate quantity with extra efforts to reap the benefits of prevailing higher prices of most of the agri-produce. In addition, improved nominal farm income during FY08 will also help boost the confidence and optimism of the farmers. Importantly, area under cotton crop, which has almost stagnated over a decade, is expected to increase amid rising cotton prices.

While water shortages are estimated to continue during *kharif* FY09, rains during April would have also likely to support the optimism amongst the farmers. In addition, availability of certified seed, certified Bt cotton seeds,¹¹ and effective pesticides are crucial factors to improve yield. Similarly, production of other two major *kharif* crops sugarcane and rice will also largely depends on sufficient monsoon rains, availability of irrigation water as well as efficient use of inputs.

¹¹ Bacillus Thuringiensis

Since 2005 cotton crop has been infested with mealy bug. This infestation has adversely impacted both the cotton yields and its quality.¹² It requires an early attention of all stakeholders to take preventive measures to ward off this menace (see **Box 2.5**). In FY08, CLCV and mealy bug incidences caused an estimated 16.4 percent loss (about 2.1 million bales) of the total production to the cotton crop.

Box 2.5: Mealy Bug – Threats and Management: Pakistan Agriculture¹³

The pink hibiscus mealy bug (PHM) - *Maconellicoccus hirsutus* (Green) - is a serious new threat to Pakistan agriculture. It is a small insect 1/5th of an inch size, gets its name from its appearance. Mealy bugs overwinter as eggs on stems, in soil, in cracks and crevices in the stem, and inside crumpled leaves. Freshly laid eggs are orange but turn pink just prior to hatch. The crawlers disperse from the ovisac by way of walking, wind, or ants. The nymphs feed and develop into adults in approximately 30 days. The insect has a life cycle of 24 to 30 days. The female mealy bug produces 10-15 generations per year in colonies of 500-600 eggs. It attacks more than 300 plant species world around, including Pakistan. These are: rice, sugarcane, cotton, fruits; papaya, carambola, avocado, citrus, sugar-apple, mango breadfruit, golden apple, cherry, plum, guava, pigeon pea, passion fruit, grape, banana; vegetables, tomato, cucumber, pumpkin, peppers, okra, dasheen, lettuce cabbage, beans, squash; ornamentals hibiscus, bougainvillea, croton, oleander, allamanda, ixora, anthurium, ginger lily, heliconia, schefflera, lantana, ficus, seagrape, and numerous weeds etc.

It feeds on the sap of the plant and releases toxic substances causing injury, curling and drying of leaves which, damages fruiting and drastically decrease the yield. Mealy bug also attacks the roots just below the level of the soil, especially where the root and the stem meet. Root mealy bug lays their eggs in sacs of interwoven filaments that resemble cotton wool. Mealy bug also excretes large quantities of honeydew onto the plant that in turn attracts ants and sooty mould. Keep ants under control as they may distribute the pests to other plants. It is also spread by wind, or it can be stuck on clothing or on the hair of animals. Mealy bug can spread rapidly once introduced in an area. The mealy bug arrived in Egypt from India in 1912 and in Hawaii in 1984. It appeared in Grenada, Trinidad, and St. Kitts in the 1990's and has spread to other islands in the Caribbean, where it attacks many hosts of economic importance. This pest is presently established in central and northern Africa, India, Pakistan, northern Australia, and southeastern Asia. In Pakistan, its significant presence viewed earlier as merely minor pests, was observed on the cotton crop in Gujarat in 2006 and, subsequently, in Punjab and the adjoining northern cotton-growing tracts in 2007. There have been reports of its growing populations from most other cotton-growing states as well. It caused a serious damage to the cotton crop in all major cotton growing districts in FY08. Similar or stronger damage is anticipated if, preventive measures were not taken.

¹² In Pakistan, 96-150 insect and mite pests attack cotton crop during its growth period. Their damage results in destruction of a large number of flower buds (square), tender shoots tips and immature bolls (green bolls) which reduces the yield. Aslam and others: (2004): J. Res. (Sci). B.Z. Univ., Multan, Pakistan 15:17-22. Insect pests cause heavy qualitative and quantitative losses in cotton yield varying from 39-50 percent. Chaudhry, G.Q. (1976) Seminar Ezzo Fertilizer Comp. Ltd., Pakistan. p. 114-118.

¹³ USDA www.pakissan.com/english/advisory/mealy_bug_an_emerging_threat_to_cotton_crop.shtml and www.bugwood.org/factsheets/mealybug.html

One or more of the symptoms may be observed these includes: (1) Crinkled or twisted leaves and shoots, (2) Bunched and unopened leaves, (3) Distorted or bushy shoots, (4) White fluffy mass on buds, stems, fruit, and roots, (5) Presence of honeydew, black sooty mold, and ants, (6) Unopened flowers which often shrivel and die and (7) Small deformed fruits.

Integrated Control Options.

- Weeds serve as host plants, should be eradicated regularly,
- Severely infested plants must be cut and burnt immediately and field should be ploughed to kill immature stages available in the soil,
- Spray as strong a stream of soapy water solution as the plant can tolerate; this should dislodge most of the bugs. This is the easiest way to control mealy bugs. Repeat if you see new egg sacs,
- Spray with a soap/oil (Mix 1 tsp. detergent surf +100 ml neem oil, and 16 liter water in a spray tank) mixture may also give better results,
- The less affected crop at early growth stage should be sprayed with Imidacloprid (120 gram/acre) or Thiamethoxam and may be repeated after 5-7 days followed by water spray. The spray should be done at the crawler stage of mealy bugs, because it is the most fragile stage and the most susceptible to chemical control,
- The foliar spray of Chlorpyrifos, Triazophos, Profenofos, and Bifenthrin may be applied at later stage of crop. (i.e. after 100 days of sowing),
- Prior to the spray of Imidacloprid, Chlorpyrifos @ 2 Liter per acre should also be applied through irrigation as to control the root infestation and suppress the pest population in the soil, and
- Biological control offers the safest, most economical and long term solution to this problem. This strategy relies on producing sufficient numbers of tiny wasps (parasitoids) that attack and kill the mealy bug. A number of natural enemies are known, including the coccinellid predator *Cryptolaemus montrouzieri* and the parasites *Anagyrus kamali* and *Gyranoidea indica* which suppress the mealy bug population. In Egypt and India, biological controls have been quite successful in suppressing the mealy bug. Other coccinellid predators have also been reported in India. At present, 21 parasites and 41 predators are known to attack this pest worldwide.

2.2 Large Scale Manufacturing

Initial prospects of achieving a reasonable growth in LSM sector during FY08 were clouded by aggravating energy crisis coupled with high international commodity prices and political unrest through most of the year. As a result, the LSM sector posted a dismal growth of 4.8 percent in the first nine months of FY08 compared with 9.0 percent in the same period of FY07 (see **Table 2.6**).

The operational constraints caused by energy shortages had a broad-based impact on manufacturing activities. However the impact was pronounced on *metal* subsector which also remained under the brunt of high international steel prices. Activities in *textiles* and *chemicals* (especially caustic soda) sub-sectors were also affected by frequent energy disruptions as well as rising input cost.

A closer look at the data provides a less comforting picture. An important

contribution to the July-Mar FY08 growth is from the sharp rise in sugar production (though decelerated relative to Jul-Jan FY08). Excluding this sub-sector, LSM growth drops to only 3.3 percent during Jul-Mar FY08 (see **Table 2.7**). Sugar industry registered a phenomenal growth despite financial problems and stalemate with government and farmers (on start of crushing season and price of sugarcane). The record high growth in sugar production is primarily owed to record bumper crop during FY08.

Table 2.6: Production of Selected LSM Items (Jul-Mar)

percent growth		
	FY07	FY08
Overall LSM	9.0	4.8
Textile	9.8	2.8
Food, beverages & tobacco	6.4	11.0
Petroleum refining	-5.2	6.0
Pharmaceuticals	7.8	30.8
Chemicals	14.4	2.4
Non-metallic minerals	21.7	17.7
Leather	7.0	3.9
Paper & board	-1.7	-5.6
Tyres & tubes	23.6	-2.7
Wood	20.7	21.9
Automobiles	6.2	-0.2
Metal	34.3	-7.6
Fertilizers	-0.1	-16.9
Electronics	12.1	-4.7
Engineering goods	18.8	19.5

Source: Federal Bureau of Statistics

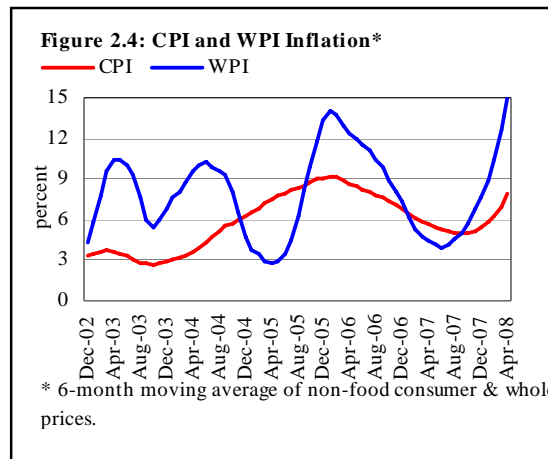
Table 2.7: Monthly Growth Performance of LSM

Table 2.7: Monthly Growth Performance of LSM			
March	FY06	FY07	FY08
Overall	10.0	14.7	2.7
Excl. Food	9.8	11.6	2.3
Excl. sugar	9.3	11.1	1.4
Cumulative Growth Performance of LSM			
Jul-Mar	FY06	FY07	FY08
Overall	8.0	9.0	4.8
Excl. food	8.2	9.6	3.5
Excl. sugar	8.6	8.8	3.3

It is important to mention here that the LSM showed some recovery in January 2008, after incurring huge economic losses in December 2007.¹⁴ However, the recovery proved short-lived for a number of reasons:

- (1) Growth in sugar production slowed to 34.0 percent in Jul-Mar FY08 compared with 51.6 percent in Jul-Jan FY08 as frost partially damaged the sugarcane crop.
- (2) Although, import of cotton increased substantially during Feb-Mar FY08, Pakistan's textile industry is facing difficulties in procuring cotton due to rising prices.¹⁵ Availability of cotton remained constrained in the domestic market with high average prices during the period.¹⁶ More importantly, slowdown in US and Euro area would likely to put further pressures on the performance of textiles sector.
- (3) The activities in edible oil/ghee industry could not gather pace during Feb-Mar FY08 reflecting ease in demand for the products due to rising prices. In addition, anecdotal evidence suggests that substitution of formal sector products with the informal sector products, particularly by small commercial users is a major contributory factor for slowdown in oil/ghee industry. Temporary suspension of palm oil supply from Karachi to the upcountry due to a row between ghee industry and truck owners for more than a week in April 2008, also hit the industry.
- (4) Similarly, the production of fertilizers remained weak during Feb-Mar due to the closure of DAP plant for BMR up gradation.

Furthermore, the recovery in remaining months of FY08 also appears remote. High key commodity prices and steady depreciation of Rupee March 2008 onwards, further increased manufacturing



¹⁴ The LSM sector grew by 7.8 percent compared with 5.4 percent and 4.2 percent in Jan 2007 and Jan 2006 respectively.

¹⁵ The quantum import of raw cotton during Feb-Mar FY08 registered a growth of 76.4 percent over Feb-Mar FY07.

¹⁶ In Feb-Mar FY08, average cotton prices were 25.9 percent higher than Feb-Mar FY07 and 6.9 percent higher than Q2-FY08.

costs. More importantly, non-food wholesale prices are increasing faster than the non-food consumer prices; reflecting relative lower corporate margins (see **Figure 2.4**).

The latter factor in particular, could significantly weaken the prospects for LSM recovery in FY08. If the current trend in commodity prices is prolonged, producers have to choose between the two: (1) increase the consumer prices proportionately; and/or (2) absorb some cost increases either by raising productivity or compromise further on profit margins.^{17,18} The impact on aggregate demand in the economy could only be mitigated through productivity gains.

Unfortunately, the crisis-like situation in domestic energy sector as well as in international commodity market does not appear to be settling down in the near future. Thus, the LSM sector is likely to remain under pressure in the short-term. However, the relative easing of a few commodity prices in international market (especially industrial metal including aluminum, copper, zinc, lead, etc) April 2008 onwards, if continued, may ease cost pressures from domestic manufacturers. Furthermore, presence of a still-strong demand in the economy may trigger a recovery in LSM. Specifically, aggregate demand has not yet weakened very substantially as:

- (1) The worsening fiscal and current account deficits throughout the first nine months of FY08 are reflective of a strong (though moderated) domestic demand.
- (2) The robust growth in exports of manufactured items (cement, chemicals and leather), during Jan-Apr FY08 hints at a strong external demand for domestic products.¹⁹ and
- (3) Although a large number of industries (10 out of 15) could not perform well; for some industries this was largely an outcome of non-economic factors. Most important among those were poor FY08 cotton harvest (hurting textile and allied industries), political unrest (especially the economic losses in the aftermath of 27th December 2007), temporary closures of certain industrial

¹⁷ The detailed accounts of the corporate sector are yet to receive. However, the preliminary results of listed companies suggest decline in profit margins during FY08 in various sectors including, textile, fertilizer, cement and automobile industry.

¹⁸ They are more likely to do this if demand is weak or because of competition. The degree of competition in markets can affect how much cost increases are passed on to consumers.

¹⁹ Exports of major manufactured items grew by 12.1 percent during Jan-Apr FY08 over Jan-Apr FY07. Cement, chemicals, towels, petroleum products, etc. were some of the commodities showing robust growth in exports during Jan-Apr FY08.

units for maintenance and/or up-gradation (e.g., polyester fiber, paper and fertilizer), and power shortages (e.g., metal industries, among others).

Moreover, a rebound in LSM is expected in subsequent years especially driven by productivity gains following the BMR/up gradation activities in various industries, despite the risk of adverse impacts of rising commodity prices. Expectation of small recovery is also supported by the continuing expansions in a number of industries. Specifically, a number of capacity expansion plans are still underway especially in paper, tyres & tubes, petroleum refining, fertilizer and cement sectors. Since most of the expansion plans in domestic manufacturing sector are aimed at reducing import dependency (except cement), a positive impact of these expansions on domestic production seems likely.

From industrial policy perspective, de-bottlenecking would not only tend to improve the production going forward but may also aid in easing price pressures in related industries. Moreover, expansion of non-traditional industries will help in achieving diversification of manufacturing activities. This diversification will also reduce vulnerability to the crisis in a single sector. Sharp growth in the production of motorcycles, engineering goods, pharmaceuticals, etc. in recent years has already helped achieve some degree of diversification in LSM value addition.

The increasing focus on emerging industries, nevertheless, needs to be complemented by a focus on structural weaknesses in traditional sectors. Textile sector needs to consolidate to gain economies of scale and improve supply chain. The government can play an important role in enabling manufacturing firms to compete in the world market by facilitating technological up-gradation in production, investment, innovative capabilities and by providing most needed energy and infrastructure. In addition, policy stability and rationalization of tariff and taxes are important elements for industrial growth to address the dynamic global and domestic environment.

Moreover, the domestic LSM sector requires new skills to manage technical change. It also needs strong technical support agencies in standards, quality, testing, research & development to achieve the required productivity improvements. In addition, smooth and uninterrupted electricity and gas supplies to manufacturing firms and adequate infrastructure will prove instrumental in LSM future outlook. Sectors which are yet to show any notable mark in the export market must focus on measures to uncap the available potential. This is because export enables firms to diversify their product range and enable them to

withstand adversities in the domestic economy in addition to helping small firms grow and become more competitive.

2.3 Services

In contrast to an expected below-target performance of commodity producing sectors, information for the first nine months of FY08 suggests that the services sector is poised to achieve the annual targeted growth. The main contributors to this performance are wholesale & retail trade, transport storage & communication as well as public administration & defence sub-sectors. In addition, sub-sectors including ownership of dwellings and social & personal services seem well placed to contribute positively towards upbeat annual growth in services sector.

However, growth in finance & insurance sub-sector appears to relatively slow due to weaker profitability of the commercial banks, nonetheless remain strong in FY08 (see **Table 2.8**).

Table 2.8: Services Sector Performance Indicators

percent growth or mentioned otherwise

	FY06	FY07	FY07	FY08
			Jul-Mar	Jul-Mar
Wholesale & retail trade				
Credit to wholesale and retail trade	8.1	-62.8	8.3	13.7
FDI in trade	126.4	46.0	57.0	15.1
Imports	38.8	6.9	8.4	25
Trade volume (imports & exports)	28.7	5.5	6.4	19.3
Transport storage & communication				
Credit to transportation storage and communication	-50.9	48.3	22.2	5.0
Petroleum crude imports	76.6	-4.9	-7.0	32.2
Commercial vehicles production (Jul-Feb)	16.1	7.9	3.7	2.5
Teledensity (percentage of population)	26.3	44.1	-	56.7
Cellular density (percentage of population)	22.2	39.9	-	52.2
Cargo handled at KPT	11.1	-5.6	-9.4	23.5
FDI in transport storage & communication	267.8	-0.5	35.0	-29.3
Finance & insurance				
Profit of commercial banks	24*	0.6*	-23.7 **	-34.4 **
FDI in financial business	22.2	182.6	162.2	-2.1
Public administration & defence				
Fiscal spending on public admin. and defence (Jul-Dec)	14.3	3.3	-3.5	14.7
Community, social & personal services				
FDI in social and personal services	162.5	23.8	39.1	12.2
Total FDI in services sector	181.5	27.4	59.5	-19.0

* : data pertains to CY; ** : data pertains to fourth quarter

Another important feature of services sector is a notable rise in its share in foreign direct investment in recent years (see **Figure 2.5**). In particular, liberalization and privatization policies helped finance and communication sub-sectors to fetch a major part of the rising FDI inflows in the country.

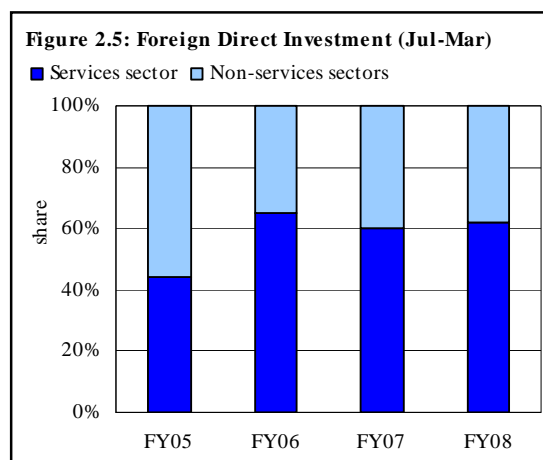
Value addition in wholesale retail trade sub-sector depends on the margins taken by merchants on the trade of domestic and imported commodities. While weakness in production of major crops and decline in growth of LSM may hamper growth in wholesale and

retail trade, buoyant growth in imports and rise in the production of minor crops are expected to recompense that impediment. Specifically, since imports contribute more than half to wholesale & retail trade sub-sector, import growth of 28.3 percent during Jul-Apr FY08 compared with 8.9 percent growth in the same period last year is likely to support the performance of this sub-sector.

Transport, storage & communication sub-sector continues to benefit from the upbeat performance of telecommunication & broadcasting. In particular, cellular density in Pakistan increased by about 9 percentage points during Jul-Mar FY08 (see **Box 2.5**).

In addition to communication, a sharp surge in cargo handling and storage at Karachi Port Trust (KPT²⁰) would also help to push up growth under transport & communication sub-sector during Jul-Mar FY08, despite mounting losses of PIA. The rise in cargo handling is principally owed to a jump in imports in this period.

Growth in finance & insurance appears to be slowing as profits of the commercial banks for CY07 increased by a mere 0.6 percent in comparison to a strong growth of 24 percent in CY06. However, the anticipated improvement in profitability of other financial institutions including insurance would likely to help achieve a reasonable growth by this sub-sector as well.



²⁰ KPT handles over 70 percent of total trade volume of the country

Social & personal services sub-sector are also positioned well to post strong growth given increased public sector focus on health and education as well as rising and active role of NGOs in the social sector of the country. Similarly, contribution of public administration & defence is expected to post a reasonable growth during FY08 mainly due to elections.

Box 2.5: Trends in Telecommunication

An important highlight of robust performance of cellular communication in Pakistan is the an impressive 109.7 percent compound annual growth (CAGR) over the preceding 7 years (2001-07) compared with Asian average of 27.4% (see **Table 2.5.1**). Other communication modes such as fixed line, wireless local loop (WLL) and broadband internet services [DSL, Wimax, Fiber to the home (FTTH)] are also picking up pace.

However, it is interesting to note that the rise in mobile phone users and revenue do not correspond the similar trend (see **Figure 2.5.1 and 2.5.2**). A relatively slow rise in revenues of cellular providers is primarily attributed to:

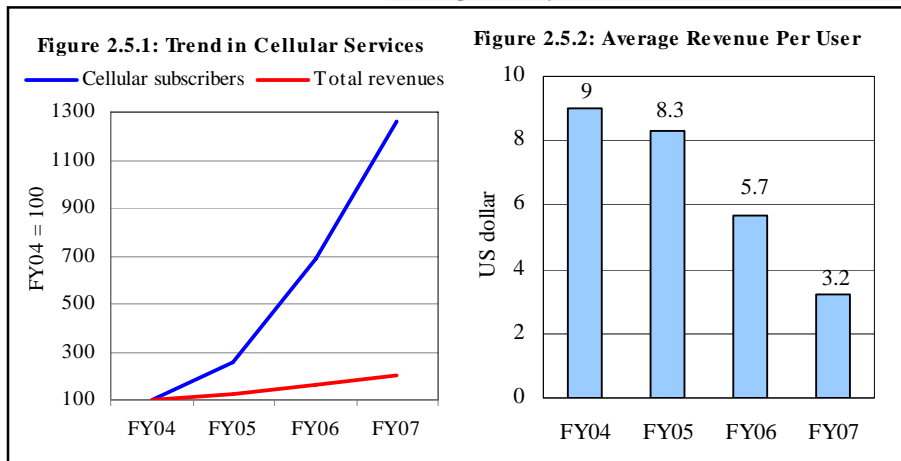
1. Reduction in call rates due

Table 2.5.1: Mobile cellular subscribers and CAGR
(in million)

	2001	2006	CAGR (percent) 2001 - 06	per 100 inhabitants 2006
Bangladesh	0.5	19.1	105.7	13.3
China	144.8	461.1	26.1	34.8
India	6.5	166.1	91	14.8
Indonesia	6.5	63.8	57.8	28.3
Iran (I.R.)	2.1	15.4	49.1	21.8
Malaysia	7.4	19.5	21.4	75.5
Nepal	0.0	1.2	131.8	4.2
Pakistan *	0.7	63.2	109.7	39.9
Saudi Arabia	2.5	19.7	50.7	78.1
Sri Lanka	0.7	5.4	52	25.9
Thailand	7.6	40.7	40.1	62.9
Viet Nam	1.3	15.5	65.4	18.2
Asia	341.2	1147.1	27.4	29.5

Source: World Telecommunication Indicators 2007

* Data pertains to year 2001-07



to intense competition as well as new technology reduced the cost of communication.

2. A majority, particularly low-income consumers are using the facility economically.
3. Most of the consumers have multiple connections, so subscribers are overestimated.
4. A large number of idle users.
5. It is important to note that information of active users and a single user in case of having multiple connections is needed to have a better analysis of the trends in the industry.