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Cotton Value Chain: Skill Gap Analysis of Service Providers

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KNOWLEDGE FOR LIFE

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List of Abbreviations

AMRI	Agriculture Mechanization Research Institute
AE	Agriculture Extension
AgEco	Agriculture Economics
AO	Agriculture Officer
APTMA	All Pakistan Textile Mills Association
BPR	Business Process Re-engineering
DDOs	Deputy District Officers
EDB	Engineering Development Board
FAs	Field Assistants
GOT	Ginning out turn
GST	General Sales Tax
ISO	International Organization for Standards
IT	Information Technology
KCA	Karachi Cotton Association
KCE	Karachi Cotton Exchange
KSAs	Knowledge, Skills and Attitudes
MINFAL	Ministry of Food Agriculture and Livestock
MoIP&SI	Ministry of industries, Production & Special Initiatives
M.T.	Million Tonnes
NCGA	National Cotton Ginners Association
NPO	National Productivity Organization
NYCE	New York Cotton Exchange
PAMCO	Punjab Agriculture Marketing Co.
PBG	plant breeding and genetics
PCCC	Pakistan Central Cotton Committee
PCGA	Pakistan Cotton Ginners Association
PCSI	Pakistan Cotton Standards Institute
RAEDC	Regional Agriculture & Economic Development Center
PARB	Punjab Agriculture Research Board
R&D	Research and Development
SBP	the State Bank of Pakistan
SMEDA	Small and Medium Development Enterprises Development Authority
TCO	Textile Commissioner's Organization
TCP	Trading Corporation of Pakistan
TDAP	Trade Development Authority of Pakistan
UAE	United Arab Emirates
UNCTAD	United Nations Conference on Trade and Development

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Executive Summary

Cotton is an important cash crop for Pakistan not only because economy of the country heavily depends upon it, but also because livelihood of a large proportion of rural population rely on it. Cotton crop is the source of raw material for industries like ginning, oil, textile and clothing. Textile industry is the largest among all of them, which accounts for 8.5 percent of GDP in the country, and more than 60 percent of the total export earnings. Moreover, its contribution in the employment market is about 40 percent (Government of Pakistan, 2008, p. 39). Besides, hundreds of thousands input suppliers are also associated with the cotton crop. So livelihood of large part of the population depends upon performance of the cotton crop.

One of the critical factors for the success of the cotton crop is the availability and access of the inputs on timely basis. Inputs required for cotton can be grouped into two categories i.e. goods and services. Goods include fertilizer, pesticides, seed and water, while services include the technical advice extended by the Extension Department, private sector and the NGOs. Goods market is operated mainly by the private sector while that for the services is mainly dominated by the public sector.

A study was conducted to find out the knowledge and skill gaps of the input suppliers and service providers in the cotton sectors. Three categories of respondents were interviewed under this study i.e. extension workers, fertilizer dealers and pesticide dealers.

Agriculture extension workers were interviewed from four districts of the cotton belt, which include Multan, Rahim Yar Khan, Lodhran and Khanewal. Table 1: Districts of the (posting) respondentsProvision of extension services on agricultural crops is a provincial subject and is carried out under the domain of Department of Agriculture. Since 1947, agricultural extension work has been existing in the country in one form or the other form. Though in the early years, it existed in the form of community development programmes like Village-Aid Programme (VAP), Basic Democracy System (BDS), Rural Works Programme (RWP), Integrated Rural Development Programme (IRDP), Peoples Works Programme (PWP). VAP commenced in 1952 and remained operational till 1961. BDS was launched in 1959 and was terminated in 1970. RWP commenced during early 1960s and was replaced by PWP in 1972. IRDP was launched in 1960s like other South Asian countries (ESCAP, 2003, p. 26) and was rolled back in 1977.

Pakistan had now a well developed extension system. The extension models in Asia can be grouped into two categories i.e. national level organization and the provincial / state level organization. First category of models is functioning in Bangladesh, Sri Lanka, Thailand and Malaysia, while second category of models is more specific to countries like Pakistan and India. The study showed that as extension system in Pakistan is supply-driven and has participation from NGOs as well.. In fact, pesticide companies have been very instrumental in providing extension services to the farmers. Ciba launched its business in Pakistan in 1972 and became largest pesticide company in Pakistan in 1998. Provision of extension services to the farmers has been part of their business operations. Besides, some fertilizer companies have also reported to have been providing extension services to farmers.

The results showed that Extension workers are facing growing competition from the pesticide and fertilizer companies, and the NGOs. There is a visible trend of increasing role of the private sector in the delivery of extension services. This trend started in Pakistan way back in 1988. Pesticide companies are generally more proactive and aggressive in offering extension services to the farmers. Even, some (21 percent) of the respondents indicated pesticide companies as important source of knowledge for them). However, the major target group of the pesticide companies comprises the big farmers, as their motivation is the profit.

As far as NGOs were concerned, though, they were meant for the small farmers, but they were still in their early stages of development and had not yet been able to reach a large proportion of the population. There were several NGOs, Rural Support Programmes (RSPs) and Water Users Associations (WUAs) which were engaged in the delivery of extension services. The only NGO which had very large network in the country was the National Rural Support Programme (NRSP). But NRSP relies more on the Extension Department in delivering services to the farmers. So there lies an open opportunity for the public sector extension workers to focus their attention more towards the small farmers. Secondly, it is possible that interventions of the private sector may conflict with the national priorities. For example, one of the intervention of the NRSP as a joint venture with a local

sugar mill, in some areas of cotton belt (Rahim Yar Khan and Rajanpur districts) launched a campaign for the promotion of sugarcane crop and lead to change in the cropping pattern with reduction in the area under cotton and increase in the sugarcane crop area. Sugarcane is high water consuming crop but is believed to be more profitable than cotton crop. It has been estimated that "one percent increase in the yield of sugarcane in the previous crop season, holding other factors constant, will result in 0.61 percent contraction in cotton area in the next season".

Extension workers in the public sector were having constraints of necessary resources and infrastructure needed for the efficient delivery of extension services. They have more or less an outdated technology for the delivery of extension services. On the other hand, their competitors were more equipped with technology and skilled. It is not possible, these days, for the governments to afford very high cost of the infrastructure to be provided to the extension departments so that they are able to compete with the private sector. The only viable solution is to carve out Public Private Partnership arrangements. Such arrangements will not only prove to be efficient and effective but also help in achieving the desired objectives of the extension departments.

Furthermore, all the input suppliers of the cotton crop have several important skill gap areas. Fertilizer dealers and the pesticide dealers have some common skill gaps like business skills, people management skills and IT skills. They were differing in some areas. Pesticide dealers need capacity building in diagnostic skills and plant protection measures. They also require more awareness relating to health issues related with use and handling of pesticides. On the other hand, fertilizer dealers need capacity enhancement in soil health management, and use of fertilizers. So a common capacity building strategy can be devised both types of the dealers.

On the other hand, Extension Workers have slightly different training needs, so their capacity building strategy should be evolved separately. They have different orientations from the dealers on many accounts. First, Extension Workers have non-profit motives, but the activities and attitudes of dealers are driven by the profit motives. Secondly, both groups operate in different paradigms i.e. public sector and the private sector.

Capacity building of all these groups will not only lead to improvement in the quality and yield of the cotton crop, but will also bring improvement in the business sector in general and the farming sector in particular. Obviously, such interventions are expected to create more job opportunities, and high income for the people associated with the farming sector. So capacity building of input supplier can help in alleviating poverty and improving livelihood.

Introduction

Cotton is an important cash crop for Pakistan not only because economy of the country heavily depends upon it, but also because livelihood of a large proportion of rural population rely on it. Cotton crop is the source of raw material for industries like ginning, oil, textile and clothing. Textile industry is the largest among all of them, which accounts for 8.5 percent of GDP in the country, and more than 60 percent of the total export earnings. Moreover, its contribution in the employment market is about 40 percent (Government of Pakistan, 2008, p. 39). Besides, hundreds of thousands input suppliers are also associated with the cotton crop. So livelihood of large part of the population depends upon performance of the cotton crop.

One of the critical factors for the success of the cotton crop is the availability and access of the inputs on timely basis. Inputs required for cotton can be grouped into two categories i.e. goods and services. Goods include fertilizer, pesticides, seed and water, while services include the technical advice extended by the Extension Department, private sector and the NGOs. Goods market is operated mainly by the private sector while that for the services is mainly dominated by the public sector.

Any improvement in the efficiency and effectiveness of the input supplier markets automatically translates into higher level of competitiveness of the cotton. Thus there exists a need to identify the skill gaps of the input suppliers, so that they are used for the development of a strategy aiming at qualitative and quantitative improvement in the cotton crop. Keeping in view the importance of the role of input suppliers especially the public sector extension workers, fertilizer dealers and the pesticide dealers, in the competitiveness of the cotton crop, a study was carried out. Objectives of the study were to carry out the situation analysis of the input markets, identify skill gaps and propose suggestions for improvement.

Methodology

A study was carried out to knowledge and skill gaps of the input suppliers and service providers in the cotton sectors. Three categories of respondents were interviewed under this study i.e. extension workers, fertilizer dealers and pesticide dealers. Interviews were conducted with the help of input specific semi-structured questionnaires, which were pre-tested before administering them on full scale basis. Category-wise profile of respondents is given below:

Profile of the Extension Workers

Provision of extension services on agricultural crops is a provincial subject and is carried out under the domain of Department of Agriculture. Punjab Department of Agriculture consists of nine directorates, two cells, two universities, and five research, development, and marketing organizations (**Annex 1**:

Attach Department/Directorate/Autonomous Bodies of the Department of Agriculture, Punjab). Provision of extension services is the responsibility of Directorate General of Agriculture (Extension &Adaptive Research). Deputy District Officer (DDO) is head of a field extension office, who is assisted by a certain number of Field Assistants (FAs).

In total 19 extension workers were interviewed. They represented four districts of the cotton belt, which include Multan, Rahim Yar Khan, Lodhran and Khanewal (Table 1: Districts of the (posting) respondents).

Table 1: Districts of the (posting) respondents

District	Frequency	Percent	Cumulative Percent
Multan	7	36.8	36.8
Rahim Yar Khan	6	31.6	68.4
Lodhran	4	21.1	89.5
Khanewal	2	10.5	100.0
Total	19	100.0	

Almost three fourth (74 percent) of the respondents were Agriculture Officers (AOs) i.e. DDOs. FAs accounted for about 21 percent of the total number of extension workers interviewed. Cotton Inspectors (CIs) are responsible for inspection of cotton quality in the ginning mills. One AI was also interviewed [Table 2: Designation of the respondents (Extension Workers)].

Table 2: Designation of the respondents (Extension Workers)

Designation	Frequency	Percent	Cumulative Percent
Agriculture Officer	14	73.7	73.7
Field Assistant	4	21.1	94.7
Cotton Inspector	1	5.3	100.0
Total	19	100.0	

The DDOs and the CIs are required to have at least 16 years of education with minimum of 4 years of education relating to agriculture. They fall in the category of officers. On the other hand, FAs are placed in the non-officer category. FAs generally have 10 to 12 years of schooling and usually possess diploma in agriculture. Officers-category accounted for about 80 percent of the sample. A majority of the respondents (almost 58 percent) had MSc (Hons) degrees i.e. 18 years of education with 6 years exclusively related with agriculture [Table 3: Education of the respondents (Extension Workers)].

Table 3: Education of the respondents (Extension Workers)

Education level	Frequency	Percent	Cumulative Percent
Matric	1	5.3	5.3
BSc (Hons)	4	21.1	26.3
MSc (Hons)	11	57.9	84.2
Diploma	3	15.8	100.0
Total	19	100.0	

There are several specializations in agriculture, which include agronomy, soil science, entomology, plant pathology (PP), plant breeding and genetics (PBG), horticulture, agricultural extension (AE), and agricultural economics (AgEco). In the survey area, largest number of people with any specialization were the agronomists (33.3 percent) followed by the experts in PBG (26.7 percent), then entomologists (20 percent), then soil scientists (13.3 percent) and finally the horticulturists (6.7 percent). None of the respondents were having specialization in AE. Similarly, other specializations which were missing include PP, and AgEco [Table 4: Specialization of the respondents (Extension Workers)]. All missing specializations are crucial for farming in general and the cotton crop production in particular.

Table 4: Specialization of the respondents (Extension Workers)

Specialization	Frequency	Percent	Valid Percent	Cumulative Percent
Agronomy	5	26.3	33.3	33.3
Soil Science	2	10.5	13.3	46.7
Plant Breeding	4	21.1	26.7	73.3
Entomology	3	15.8	20.0	93.3
Horticulture	1	5.3	6.7	100.0
Total	15	78.9	100.0	
Missing | System	4	21.1		
Total	19	100.0		

A majority (53 percent) of the respondents were having experience ranging from 11 to 20 years. Only one respondent was having experience in the category of 6 – 10 years (Figure 1: Experience of the respondents). It is due to the fact that for a long period of time, recruitment remained banned.

Figure 1: Experience of the respondents

Profile of the Fertilizer Dealers

All of the respondents from the category of fertilizer dealers were literate, though, only 25 percent of them were graduates. However, 50 percent of the respondents were having maximum of 10 years schooling (Table 5: Education of respondents from the fertilizer dealers). If matric is considered as minimum education for training in fertilizer and fertility management, then around 85 percent of the pesticide dealers are eligible for it.

Table 5: Education of respondents from the fertilizer dealers

Education level	Frequency	Percent	Cumulative Percent
Middle	3	15.0	15.0
Matric	7	35.0	50.0
Intermediate	5	25.0	75.0
Bachelor Degree	3	15.0	90.0
Master Degree	2	10.0	100.0
Total	20	100.0	

A majority (80 percent) of the fertilizer dealers had their dealership older than 10 years. Only 20 percent new dealerships could be opened up during last 10 years, which implies that fertilizer dealership is relatively a restricted business.

Table 6: Experience of the respondents (fertilizer dealers)

Experience	Frequency	Percent	Cumulative Percent
Up to 10 years	4	20.0	20.0
11 – 15	6	30.0	50.0
16 – 20	4	20.0	70.0
21 – 25	3	15.0	85.0
Above 25	3	15.0	100.0
Total	20	100.0	

Profile of the Pesticide Dealers

Respondents from the pesticide dealers were found to be more literate than those from the fertilizer group. Average number of schooling years was found to be 12 in case of pesticide dealers and 11.4 in case of fertilizer dealers (Table 7: Education of respondents from the pesticide dealers).

Table 7: Education of respondents from the pesticide dealers

Education level	Frequency	Percent	Cumulative Percent
Middle	2	10.0	10.0
Matric	5	25.0	35.0
Intermediate	6	30.0	65.0
Bachelor Degree	3	15.0	80.0
Master Degree	4	20.0	100.0
Total	20	100.0	

Average experience of the pesticide dealers was found to be around 13 years. However, a majority of the dealers (55 percent) has experience less than 16 years [Table 8: Experience of the respondents (pesticide dealers)].

Table 8: Experience of the respondents (pesticide dealers)

Experience	Frequency	Percent	Cumulative Percent
Up to 10 years	5	25.0	25.0
11 – 15	6	30.0	55.0
16 – 20	3	15.0	70.0
21 – 25	2	10.0	80.0
Above 25	4	20.0	100.0
Total	20	100.0	

Extension Services

Overview of Extension System in Pakistan

Since 1947, agricultural extension work has been existing in the country in one form or the other form. Though in the early years, it existed in the form of community development programmes like Village-Aid Programme (VAP), Basic Democracy System (BDS), Rural Works Programme (RWP), Integrated Rural Development Programme (IRDP), Peoples Works Programme (PWP) and so on (Hussain, 2004). VAP commenced in 1952 and remained operational till 1961 (ESCAP, 2003, p. 24). BDS was launched in 1959 and was terminated in 1970. RWP commenced during early 1960s and was replaced by PWP in 1972. IRDP was launched in 1960s like other South Asian countries (ESCAP, 2003, p. 26) and was rolled back in 1977.

Pakistan has now a well developed extension system. The extension models in Asia can be grouped into two categories i.e. national level organization and the provincial / state level organization. First category of models is functioning in Bangladesh, Sri Lanka, Thailand and Malaysia, while second category of models is more specific to countries like Pakistan and India (

Country	Level of Organization	Public sector performance	NGO	Private sector	Provision of farm management advice
India	Provincial/ state	Well organized top-heavy.	high	high	Low
Pakistan	Provincial/ state	Well organized top-heavy high overheads.	low	low	Nil
Bangladesh	National	Many organizational changes; narrow commodity focus.	high	moderate	low
Sri Lanka	National	Lack of coherent policy; sectoral structure; weak coordination between government departments.	low	low	low
Thailand	National	Increases in number of extension staff at provisional and district level. Ratio of extension worker to farm family 1:1000	low	high	moderate
Thailand	National	Top-down orientation; rigid and bureaucratic; farming systems approach followed.	low	low	nil
Malaysia	National	Well organized commodity-based extension.	low	high	high

). Kahan (2007) is of the view that private sector and the NGOs have low participation in the provision of extension services in Pakistan. The present study partially agrees with Kahan (2007) as extension system in Pakistan is supply-driven and has low participation from NGOs. However, we disagree with Kohan that there is low participation from the private sector. In fact, pesticide companies have been very instrumental in providing extension services to the farmers. Ciba launched its business in Pakistan in 1972 and became largest pesticide company in Pakistan in 1998 (Davidson, Ahmad, & Ali, 2001, p. 5). Provision of extension services to the farmers has been part of their business operations. Besides, some fertilizer companies have also reported to have been providing extension services to farmers.

Table 9: Models of extension: Asia

Country	Level of Organization	Public sector performance	NGO	Private sector	Provision of farm management advice
India	Provincial/ state	Well organized top-heavy.	high	high	Low
Pakistan	Provincial/ state	Well organized top-heavy high overheads.	low	low	Nil
Bangladesh	National	Many organizational changes; narrow commodity focus.	high	moderate	low
Sri Lanka	National	Lack of coherent policy; sectoral structure; weak coordination between government departments.	low	low	low
Thailand	National	Increases in number of extension staff at provisional and district level. Ratio of extension worker to farm family 1:1000	low	high	moderate
Thailand	National	Top-down orientation; rigid and bureaucratic; farming systems approach followed.	low	low	nil
Malaysia	National	Well organized commodity-based extension.	low	high	high

Source: Kahan (2007, p. 20)

Survey findings

In total, we interviewed 19 extension workers. Results of the survey are given below:

How many farmers visit?

Extension Workers reported that average number of farmers visiting them 2 to 20 per day with average of 9.95. Only 11 percent of the respondents informed that farmers visiting them each day exceed 16 (Table 10: How many farmers visit you per day?). This number is quite small as thousands of farmers fall in the jurisdiction of each EW. Moreover, it also supports the Kahan's (2007) statement that present extension services in the country are not demand driven and are supply driven.

Table 10: How many farmers visit you per day?

No. of farmers	Frequency	Percent	Cumulative Percent
Less than 5	2	10.5	10.5
5 – 8	7	36.8	47.4
9 – 12	5	26.3	73.7
13 – 16	3	15.8	89.5
Above 16	2	10.5	100.0
Total	19	100.0	

Number of farmers visited each month by an EW ranged, as reported by them, from 10 to 400 with average of 151. Even this number is too small as compared to the number of farmers. A majority of

the respondents (68 percent) indicated that numbers of farms they visit each month were not exceeding 200 (Table 11: Number of farmers visited each month).

Table 11: Number of farmers visited each month

Number of Farmers	Frequency	Percent	Cumulative Percent
Up to 10	1	5.3	5.3
11 – 100	6	31.6	36.8
101 – 200	6	31.6	68.4
201 – 300	5	26.3	94.7
Above 300	1	5.3	100.0
Total	19	100.0	

Why cotton growers visit you?

Why cotton growers visit you? Respondents indicated that they visit them to seek information on four broad areas with the objective of increasing yield of their crops (Table 12: Why cotton growers visit you?). These four areas include plant protection, agronomic practices, use of fertilizer and variety selection. Results reveal that major concern of the farmers is the plant protection from diseases, and pests, followed by the production technology including fertility management. Variety selection is the area of lowest priority for the farmers in seeking advice from the extension workers.

Table 12: Why cotton growers visit you?

Major area of advise	Frequency	Percentage
Plant protection measures, pest scouting, selection and use of pesticides	15	78.95
Production technology and agronomic practices	11	57.89
Use of fertilizer	6	31.58
Variety selection	4	21.05

Perceived effectiveness of the extension services

Only one fourth of the respondents (26 percent) believed that effectiveness of the extension services provided by them was good. However, a majority of them termed it just satisfactory (Table 13: Perceived effectiveness of the extension services.

Table 13: Perceived effectiveness of the extension services

Effectiveness level	Frequency	Percent	Cumulative Percent
Poor	3	15.8	15.8
Satisfactory	11	57.9	73.7
Good	5	26.3	100.0
Total	19	100.0	

How much proportion of farmers does not act upon your advice?

How many farmers among those who consult you, do not act upon your advices? Around 16 percent of the agriculture extension workers reported that farmers who generally do not act upon their advices exceed 50 percent (

Table 14: How much proportion of farmers does not act upon your advice?). Average number of farmers of such category, reported by the EWs, is around 27 percent.

Table 14: How much proportion of farmers does not act upon your advice?

Percent of farmers	Frequency	Percent	Cumulative Percent
Less than 10	7	36.8	36.8
11 – 30	6	31.6	68.4
31 – 50	3	15.8	84.2
51 – 70	2	10.5	94.7
Above 70	1	5.3	100.0
Total	19	100.0	

Why do not farmers act upon your advice?

Lack of resources is the major reason of why farmers do not act upon advice of the extension workers. Around 74 percent of the respondents from the Extension Department termed lack of resources available with farmers as the major reason. Owing to financial constraints, farmers are unable to act on their advices. Even in case when they purchase inputs on credit from the dealers, they have to accept dealers' terms and conditions as well. Dealers sell what they desire to sell, whether that is of good quality or is sub-standard.

Second most important reason is the shortage of irrigation water. Owing to inadequacy of water, farmers are mostly unable to act upon advices of the extension department. This problem is compounded from the growing problem of load-shedding, which constrains the farmers in using the tube-well water. Other reasons include lack of education, laggardness of the farmers, lack of farmers' confidence in the advice of extension department, and so on (Table 15: Why do not farmers act upon your advice?). Most of the farmers follow a new practice after someone has successfully demonstrated the results. It leads to the suggestion that Extension Department should make arrangements for maximum number of demonstration plots in every region.

Table 15: Why do not farmers act upon your advice?

Why do not farmers act upon your advice?	Frequency	Percentage
Lack of resources	14	73.68
Shortage of irrigation water	6	31.58
Lack of education	4	21.05
Most of the farmers are laggards	4	21.05
Do not have confidence in advice	4	21.05
Black marketing of inputs	3	15.79
High cost of inputs	3	15.79
Low returns from cotton sale	1	5.26
Lack of inputs availability	1	5.26
Credit taken from the dealers	1	5.26
Relations with officials of pesticide companies	1	5.26

Yield of cotton

Yield of cotton reported by the respondents in their respective territories ranged from mere 81 kg per hectare to 1296 kg per hectare, while maximum yield potential was reported to be 1619 kg per hectare(Table 16: Yield of cotton). These statistics clearly indicate that there exists substantial scope for improvement in the yield.

Table 16: Yield of cotton

Yield	N	Minimum	Maximum	Mean	Std. Deviation
Highest yield	19	453	1296	45.37	13.765
Lowest yield	19	81	340	12.47	4.538
Average yield	19	291	486	22.05	3.082
Potential yield	19	567	1619	54.26	16.323

What are issues and problems responsible for low yield of cotton?
The respondents identified several issues responsible for low yield of cotton in their territories. These issues have been grouped into four themes i.e. financial capital, agronomic practices, fertilizer, plant protection and others. Plant Protection ranked the top among the four themes, followed by others, fertilizer, and financial capital (Table 17: Reasons of low cotton yield). Attack of insects and diseases was identified as major reason by maximum number of respondents (42 percent).

Table 17: Reasons of low cotton yield

Reasons of low cotton yield	Frequency (Votes)	Percentage
Financial Capital	8	
Lack of capital	7	36.84
Expensive credit from dealers	1	5.26
Agronomic	5	
Lack of soil fertility management	2	10.53
Poor land preparation	2	10.53
Late sowing	1	5.26
Fertilizer	16	
Shortage of fertilizer	7	36.84
High price of fertilizer	5	26.32
Untimely or inappropriate use of fertilizer	3	15.79
Poor quality of fertilizer	1	5.26
Plant Protection	26	
Insects and diseases (Leaf curl virus etc.)	8	42.11
Shortage of pesticides	6	31.58
Poor quality of pesticides	3	15.79
High price of quality pesticides	3	15.79
Untimely or no identification of pests and diseases	2	10.53
Poor spraying techniques	2	10.53
No special pesticide for Jassid & Thrips control	2	10.53
Others	22	
Non-standardized seed (impure, poor quality etc).	7	36.84
Shortage of water	6	31.58
Lack of education (of farmers)	3	15.79
Low returns from sale of cotton	3	15.79
Load shedding	2	10.53
Less mechanization	1	5.26

How cotton yield can be increased?
How cotton yield can be increased? The respondents suggested 20 measures to give a big boost to the yield of cotton in the country. These measures have been grouped into three categories, i.e.

policy initiatives, administrative initiatives and the capacity building initiatives. Under policy initiatives, two major suggestions include ensuring the availability of cheap credit and quality fertilizer in the market. It may be surprising to note that ensuring availability of fertilizers has been put in the policy initiative while that for pesticides in the category of administrative initiatives. It is due to the reason that fertilizer market in Pakistan is more regulations while that for pesticides is open (Table 18: How cotton yield can be increased?).
In the category of administrative initiatives, top two suggestions include ensuring the availability of quality pesticides and the quality seed. Availability of quality seed of high yielding varieties is crucial for giving boost to the cotton yield as is evinced from the past experience. Punjab province could achieve 53 percent of total factor productivity gains from 1971 to 1994, only due to improved varieties (World Bank, 2007, p. 52).

Table 18: How cotton yield can be increased?

Suggestion for increasing cotton yield	Frequency	Percentage
Policy Initiatives	**24**	
Availability of easy credit with low interest	6	31.58
Ensure availability of fertilizer in the market	6	31.58
Reasonable support price	5	26.31
Develop CLCV resistant varieties	4	21.05
Reduce the electricity and diesel prices	1	5.26
High yielding varieties	1	5.26
Provision of electricity	1	5.26
Administrative Initiatives	**20**	
Ensure availability of quality pesticides	8	42.11
Ensure availability of quality seed in the market	4	21.05
Control of input prices	3	15.79
Availability of water	2	10.53
Posting of Entomologists in each territory	1	5.26
Posting of extension staff at union council level	1	5.26
Ensure availability of spray machines in market	1	5.26
Capacity building of farmers	**22**	
Pest management	6	31.58
Land preparation	5	26.32
Fertilizer use	5	26.32
Agronomic practices	4	21.05
Motivation	1	5.26
Marketing	1	5.26

What are issues and problems responsible for low quality of Cotton?

The survey of the EWs has identified 17 issues responsible for low quality of cotton in Pakistan. They have been grouped into four categories i.e. picking and storage, pests and diseases, inputs and finances, and others. In the category of picking and storage, major issues include improper way of picking, improper time of picking improper handling after picking. Improper picking is due to non-availability of skilled (trained) labour for picking. Second reason is absence of any incentive for quality picking.

Pests and diseases also cause damage to quality of cotton. Pick bollworm was reported to be a major source of quality damage. Surprisingly, leaf curl virus was reported, to be cause of deterioration in the quality of cotton, by only 5 percent of the respondents. This could be due to the fact that incidence of the attack of leaf curl virus has reduced.

Poor quality of seed was reported to be another cause of poor quality of cotton, by around 16 percent of the respondents. In the category of others, lack of training of the farmers emerged as top most reason (

Table 19: Issues responsible for low quality of cotton).

Table 19: Issues responsible for low quality of cotton

Issue responsible for low quality	Frequency	Percentage
A. Picking and storage	**30**	
Improper way of picking	10	52.63
Improper time of picking	8	42.11
Improper handling after picking	6	31.58
Improper storage	5	26.32
Mixing of varieties	1	5.26
B. Pests and diseases	**9**	
Lack of control of pink bollworm	5	26.32
Lack of pest management practices	3	15.79
Leaf curl virus	1	5.26
C. Inputs and finances	**6**	
Poor quality seed	3	15.79
Lack of availability of capital	1	5.26
Adulteration of seed, fertilizer and pesticides	1	5.26
Cultivation of unapproved varieties	1	5.26
D. Others	**11**	
Lack of training of farmers	5	26.32
Low returns to farmers	3	15.79
Poor marketing practices	1	5.26
Non-availability of labour	1	5.26
Use of unfit ground water	1	5.26

Suggestion for improving quality of Cotton

Suggestions given by the respondents for the improvement of the quality of cotton have been grouped into five categories i.e. pricing policies, picking improvement interventions, handling and storages, seed and others (

Table 20: Suggestion for improving quality of Cotton). The major suggestion related with pricing policy. If appropriate price premium is available for the quality cotton, the market forces would automatically take care of the quality.
In the category of picking improvement related suggestions, training of the cotton pickers has emerged as a leading suggestion.

Table 20: Suggestion for improving quality of Cotton

Suggestion for improving quality of Cotton	Frequency	Percentage
A. Pricing policies	**16**	
Price premium for quality of cotton	7	36.84
Reasonable support price	3	15.79
Discouraging mixing of cotton varieties	2	10.53
Ginners should be forced to give incentives for better quality	1	5.26
Discouraging contamination	1	5.26
B. Proper picking practices	**9**	
Training of pickers in cotton picking	6	31.58
Proper time for picking	3	15.79
C. Handling and Storage	**7**	

Capacity building of farmers	5	26.32
Storage of cotton in proper place	2	10.53
D. Seed	**3**	
Ban on the use of unapproved varieties	2	10.53
Timely availability of quality seed	1	5.26
E. Others	**7**	
Effective control of pink bollworm	4	21.05
Control of input prices	1	5.26
Timely availability of quality fertilizer	1	5.26
Enforcement of Cotton Control Act	1	5.26

Perceived current knowledge of the extension workers

Knowledge of the extension workers is very crucial for the improvement in the efficiency and the effectiveness of the extension services. A big majority (84 percent) of the respondents claimed to be completed updated with the knowledge about cotton production (Table 21: Are you completely updated with knowledge about cotton production).

Table 21: Are you completely updated with knowledge about cotton production

Knowledge update	Frequency	Percent	Cumulative Percent
No	3	15.8	15.8
Yes	16	84.2	100.0
Total	19	100.0	

If majority is knowledgeable, then why improvement in the cotton production system is not visible? It appears that majority of EWs are more likely to be trapped in the box of “I know every thing”. This phenomenon is more evident from the Table 22: Number of courses attended and their perceived knowledge. In total 42 percent of the respondents reportedly did not attend any training during last five years out of which 36.8 percent claimed to have updated knowledge about cotton production.

Table 22: Number of courses attended and their perceived knowledge

No. of courses	Are you updated?		Total
	No	Yes	
Nil	5.3	36.8	42.1
1 – 3	10.5	21.1	31.6
4 – 6	0.0	15.8	15.8
Above 6	0.0	10.5	10.5
Total	15.8	84.2	100.0

A majority (73 percent) of the respondents who attended the courses rated the courses as beneficial to highly beneficial. However, a small proportion of the respondents (9 percent) did not found them as useful. Why did not they find them useful?

Table 23: Usefulness of the training course participated by extension workers

Usefulness level	Frequency	Percent	Valid Percent	Cumulative Percent
Little use	1	5.3	9.1	9.1
Satisfactory	2	10.5	18.2	27.3
Beneficial	5	26.3	45.5	72.7
Highly Beneficial	3	15.8	27.3	100.0
Total	11	57.9	100.0	
System	8	42.1		

Total	19	100.0		

Around 27 percent of the respondents, who participated in any training course during last five year, rated the courses as of little use or just satisfactory but reported that they are completely updated with knowledge of cotton production. It appears that training system including curriculum of the courses, and their delivery need improvement.

Table 24: Usefulness of the training course and feeling of "I am updated"

Usefulness of course	Are you updated?		Total
	No	Yes	
Little use	0	9.1	9.1
Satisfactory	0	18.2	18.2
Beneficial	18.2	27.3	45.5
Highly Beneficial	0	27.3	27.3
Total	18.2	81.8	100.0

Latest training course participated by extension workers

What are the training courses, the extension staff has recently participated? The courses mainly related with plant protection (Table 25: Latest training course participated by extension). Other areas like farm management, fertility management, cotton picking, handling and storage, marketing etc. do not seem to be the priority areas for the training managers.

Table 25: Latest training course participated by extension

Latest training course participated by extension	Frequency	Percentage
IPM	4	21.1
Better plant protection measures	3	15.7
Mealy bug and whitefly management	2	10.5
Cotton production technology	2	10.5
None	8	42.1

Other sources of knowledge relating to cotton production for extension workers

What are the other sources of knowledge for the extension workers? A majority (63 percent) of the respondents considers Zaraat Nama as other major source of knowledge. Linkages with research institutions seems to be very weak as only 5.3 percent respondents deemed them as source of knowledge for them. Similarly, it is also surprising to note that only one fourth of the respondents (26 percent) reported it as a source of knowledge for them (Table 26: Other Sources of knowledge for extension workers). Learning from farmers, especially the progressive farmers, is indeed a good idea. However, only one fourth of the respondents reported to have benefited from them.
Are pesticide companies also an important source of knowledge? More than 20 percent of the respondents termed them as source of knowledge for the extension workers. However, it is yet to be examined, to what extent the knowledge provided by the pesticide companies is unbiased and is useful.

Table 26: Other Sources of knowledge for extension workers

Sources of knowledge	Frequency	Percentage
Magazines (Zaraat Nama etc.)	12	63.2
Internet	5	26.3
Farmers	5	26.3
Newspapers	5	26.3

Pesticide companies	4	21.1
Other literature	4	21.1
TV Programmes	3	15.8
Books	2	10.5
Research Journals	2	10.5
Libraries	2	10.5
Field experience	1	5.3
Agricultural research institution	1	5.3

Training needs of the extension workers

What are the current training needs of the extension workers? Use of computer, especially the MS Office emerged as top most need for the. Almost 79 percent of the respondents indicated MS office as their top most need. It clearly reveals the current level of the computer literacy among the extension workers. Fertility management came out as second most pressing training need for the extension workers (Table 27: Perceived training needs of the extension professionals). Communication skills are imperative for the effective delivery of the extension services. However, 11 percent of the respondents reported their communication skills as poor and about 16 percent rated them as just satisfactory. Training managers of the extension departments of the provinces would have to consider these areas for designing strategy for the capacity building of the extension professionals.

Table 27: Perceived training needs of the extension professionals

Training need	N	Minimum	Maximum	Mean	Std. Deviation
MS Office	19	2	5	4.26	1.046
Soil/health Management	19	2	5	4.05	.970
Internet	19	2	5	4.00	1.106
Marketing Management	19	2	5	3.84	1.167
Communication Skills	19	3	5	3.79	.855
Writing Skills	19	2	5	3.74	.933
People Management Skills	19	2	5	3.68	1.003
Agronomic Practices	19	2	5	3.63	.895
Plant Protection	19	2	5	3.58	.961
Soil Science	19	2	5	3.53	1.124
Water Management	19	2	5	3.42	1.170

Infrastructure available with extension staff

However, only about 11 percent of the respondents reported to have printers and internet facility in their offices. Only 21 percent respondents reported to jeeps, and 47 percent to have bikes. Only about 5 percent respondents were having access to any library. However, around 74 percent were having access to agriculture related magazines.

Table 28: Availability of computers

Computer availability	Frequency	Percent	Valid Percent	Cumulative Percent
No	15	78.9	78.9	78.9
Yes	4	21.1	21.1	100.0
Total	19	100.0	100.0	

Problems of extension workers

Inadequate transport facilities to access farms and farming community, came out as a major issue constraint in the delivery of extension services. This issue was highlight by around two third of the

respondents (63 percent). It is surprising to note that only 5.3 percent respondents termed lack of training as a problem or issue, (

Table 29: Major issues of extension workers). However, among the suggestions, training was suggested by about 42 percent of the respondents as a mean to improve the quality of the extension services (Table 30: Suggestions for improvement in extension services .

Table 29: Major issues of extension workers

Major issues	Frequency	Percentage
Lack of transport facility	12	63.2
Shortage of staff	4	21.1
Jurisdiction area is very large	3	15.8
Financial problems	2	10.5
Lack of multimedia projectors	2	10.5
k Acceptation of the farmers	1	5.3
Lack of trainings	1	5.3
Weak integration with research institutions	1	5.3
Low salary and other financial incentives	1	5.3

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Suggestion for improvement in effectiveness of the extension services

Ho can efficiency and effectiveness of the extension services be improved? Most of the suggestions given by the respondents relate with the incentives and facilities. A majority (68 percent) of the respondents suggested providing the adequate level of transport facilities to them. Similarly, 21 percent respondents demanded increase in budget for travelling and daily allowances and 16 percent insisted for raise in their salaries. Only 5.3 percent of the respondents urged that the facility of Internet be provided to them.

Table 30: Suggestions for improvement in extension services

Suggestion	Frequency	Percentage
Transport problems should be resolved	13	68.42
Training	8	42.11
Increasing budget for TA/DA	4	21.05
Funds for demonstration plots	3	15.79
Vacant positions should be filled	3	15.79
Increase in salary	3	15.79
Coverage area be reduced	3	15.79
Contract system of employees discouraged	1	5.26
Medical facilities	1	5.26
Budget for refreshment / seminars	1	5.26
Internet facility should be provided	1	5.26
Integration with research institutions	1	5.26

Challenges and suggestions

The results of this study indicate that the extension workers are facing several challenges, as discussed below:

Competition from the fertilizer and the pesticide companies

Extension workers are facing growing competition from the pesticide and fertilizer companies, and the NGOs. There is a visible trend of increasing role of the private sector in the delivery of extension services. This trend started in Pakistan way back in 1988 (Bajwa, 2004). Pesticide companies are generally more proactive and aggressive in offering extension services to the farmers. Even, some (21 percent) of the respondents indicated pesticide companies as important source of knowledge for them (Table 26: Other Sources of knowledge for extension workers). However, the major target group of the pesticide companies comprises the big farmers, as their motivation is the profit.

As far as NGOs is concerned, though, they are meant for the small farmers, but they are still in their early stages of development and have not yet been able to reach a large proportion of the population. There are several NGOs, Rural Support Programmes (RSPs) and Water Users Associations (WUAs) which are engaged in the delivery of extension services (Bajwa, 2004). The only NGO which has very large network in the country is the National Rural Support Programme (NRSP). But NRSP relies more on the Extension Department in delivering services to the farmers. So there lies an open opportunity for the public sector extension workers to focus their attention more towards the small farmers. Secondly, it is possible that interventions of the private sector may conflict with the national priorities. For example, one of the intervention of the NRSP as a joint venture with a local sugar mill, in some areas of cotton belt (Rahim Yar Khan and Rajanpur districts) launched a campaign for the promotion of sugarcane crop and lead to change in the cropping pattern with reduction in the area under cotton and increase in the sugarcane crop area (Bajwa, 2004). Sugarcane is high water consuming crop but is believed to be more profitable than cotton crop. It has been estimated by Nosheen & Iqbal (2008) that “one percent increase in the yield of sugarcane in the previous crop season, holding other factors constant, will result in 0.61 percent contraction in cotton area in the next season” (p. 59).

It is a question of national importance that can we afford such transformation in the cropping pattern in a situation when water table is falling very rapidly in the cotton belt. So there is a need of public private partnership (PPP) in the delivery of extension services for higher degree of alignment of the interventions with the national priorities and greater efficiency and effectiveness. So the provincial extension departments will have to prepare for assuming new roles in the changing landscape of the extension services in the country. The earlier the better, otherwise, they are highly prone to getting irrelevant.

Limited resources

Extension workers in the public sector are having constraints of necessary resources and infrastructure needed for the efficient delivery of extension services. They have more or less an outdated technology for the delivery of extension services. On the other hand, their competitors are more equipped with technology and skilled. It is not possible, these days, for the governments to afford very high cost of the infrastructure to be provided to the extension departments so that they are able to compete with the private sector. The only viable solution is to carve out PPP arrangements. Such arrangements will not only prove to be efficient and effective but also help in achieving the desired objectives of the extension departments.

Frustration among extension workers

Public sector extension workers are having low motivation and high frustration, which is evident from the discussions made earlier in this report. Most of the suggestions the extension workers gave, were related with salaries and financial incentives. This feeling is primarily due to the fact that their counterparts in the pesticide and fertilizer companies have many times more salaries and other perks. It is proposed that size of the department should be reduced and capacity of the professionals should be enhanced through trainings and other related assignments. They should be given more financial incentives. Ranks of FAs should be gradually phased out. However, linkages between the extension departments and the agriculture universities should be strengthened. It is compulsory for almost all students of these universities to undergo internship programme for a duration equivalent to one semester. Such students should be assigned to work with farmers under the supervision of extension department professionals.

Organizational design

Organizations with large number of layers can not work efficiently. It is especially more pertinent for those which are responsible for the delivery of services to rural masses. The present organizational structure of the extension departments in the provinces is too bureaucratic, rigid and inefficient. Things have got complicated with the devolution of system in recent years, in which department of extension services has been devolved to the district level. Apparently, system has been simplified, but practically, it has been made even more complicated, as in the new settings, the extension workers report not only to the district governments but also to the provincial hierarchy.

There is a need of change in the system of extension services keeping in view the fast changes taking place around them, especially in the context of the growing competition from the private sector in the delivery of extension services. This would involve transformation of the extension department from being too rigid and too bureaucratic to more flexible and responsive to the needs of the farmers. Paradigm shift from supply driven to demand driven system of the delivery of extension services is needed. Such transformations fall under the discipline of Organizational Development. It would require exercise of the Business Process Re-engineering (BPR) to be instituted in the extension departments. Besides, these departments can also be put through the process of ISO certifications so as to bring improvement in the delivery of services.

Skill gaps

Extension workers lack skills and knowledge in several areas as discussed as below:

Incompetence in computer and internet usage

The use of MS Office emerged as top most and Internet as third important training needs of the extension workers, with mean score of 4.26 and 4.00 respectively, on scale of 5.00. Level of computer literacy among the extension workers is very low. In the era of hi-tech, how is it possible that without computer literacy they can keep pace with fast changes taking place around them. Moreover, it is also not possible for them to benefit from the Internet, which is now very important source of knowledge. So the training managers of the extension departments should immediately workout a comprehensive programme for improvement in the computer literacy.

Lack of knowledge and skills in soil health Management

Soil health Management emerged as second most important training need of the extension workers. Maintaining soil health is becoming increasingly difficult challenge in Pakistan as soil and water degradation issues are gaining grounds. About one third of the productivity gains to be accrued from technical progress in Pakistan have been wiped out due to soil and water degradation (World Bank, 2007, p. 53) and extension workers have not been able to abate the trend. So extensive training programmes should be chalked out to build up the capacity of the extension workers in how to deal with this challenge soil health.

Poor marketing skills

Poor Marketing skills were another important knowledge gap for the extension workers because farmers' returns from the farm activities are significantly dependent upon their marketing skills. Marketing of agricultural commodities is very complex and therefore requires sound understanding of the market operations, interaction of the market forces, requirements of the customers, preferences of the end users, need analysis, and so on.

Poor communication and people management skills

Communication skills were also identified as important training needs for the extension workers, as they are imperative for effective delivery of the extension services. However, due attention has not been paid to these skills. Similarly, people management skills also emerged as crucial training needs for the extension workers. People management skills are particularly more important in an organization where a large number of people are facing the dilemma of low morale and high frustration.

Poor inadequate writing skills

Another knowledge gap of the extension worker is the writing skills. They need effective writing skills so as to prepare technical reports based on the data collected from the fields. Such skills are also important for documenting the best management practices being followed by the farmers and for dissemination of such practices among the farmers.

Technical knowledge and skills

Technical skills secured lower score than other training needs. The survey has identified four types of technical skills as knowledge gaps for the extension workers, which include agronomic practices (AP), plant protection (PP), soil science (SS) and the water management (WM). Average score of training need was estimated to be 3.63 for AP 3.58 for PP, 3.58 for SS and 3.42 for WM.

Fertilizer

Overview of the Fertilizer Market in Pakistan

The fertilizer companies and the government agencies stock the fertilizer in warehouses, which are 1075 in the country. Total capacity of these warehouses is around 1.075 million product tonnes, which comes to around 18 percent of the sum total of the fertilizer produced and imported during 2006-07 (NFDC, 2007, p. 37).

About 80 percent of these warehouses are owned and maintained by the private sector. Fertilizer is distributed through the network of 8,198 dealers in the country. There are 5,313 fertilizer dealers in Punjab province and 1,955 in Sindh province (NFDC, 2007, p. 37).

Nitrogen accounted for more than three fourth (77 percent) of the sum total quantity of the fertilizer imported and the fertilizer produced in the country. Remaining quantity of fertilizer was contributed by phosphate (about 22 percent) and the potash (0.68 percent). As far as self-reliance ratio (production / (import + production) * 100) is concerned

However, in terms of the quantity of products, domestic production accounted for about 80 percent of the total fertilizer requirement of the country during 2006-07 (NFDC, 2007, p. 2).

Table 31: Production and import of nutrients during 2006-07

Nutrient	Production		Import		Total	
	'000 tonnes	Percent	'000 tonnes	Percent	'000 tonnes	Percent
Nitrogen	2427	68.50	308	8.69	2735	77.19
Phosphate	308	8.69	476	13.43	784	22.13
Potash	12	0.34	12	0.34	24	0.68
Total	2747	77.53	796	22.47	3543	100.00

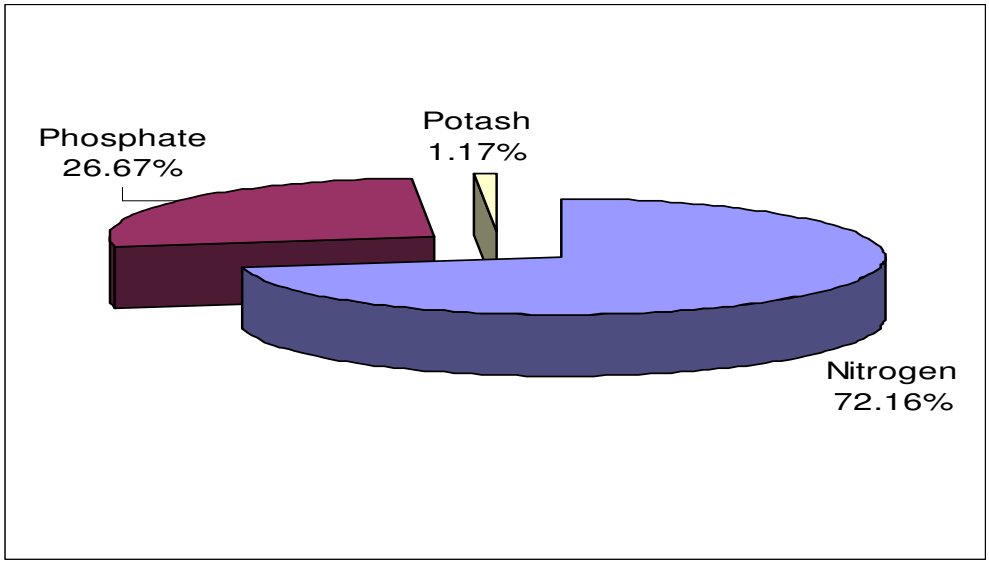
Source: NFDC (2007, pp. 2-3)

On overall basis, nutrient off take in Pakistan increased by around 22 percent during 2006-07 when compared with that in 2002-03.

Nitrogen is the major nutrient consumed in the country followed by phosphate and the potash. As the statistics of 2006-07, Nitrogen accounts for around 72 percent of the total nutrients off take in the country, and phosphate for about 27 percent (

Figure 2: Composition of fertilizer nutrients off take during 2006-07). There is a trend of growing use of phosphate and potash in the world. It is evident from the fact that world production of these two nutrients i.e. phosphate and potash grew to 172.1 million tonnes and 55.7 million tonnes respectively in 2007, from 144.1 million tonnes and 42.6 million tonnes respectively in year 2001 (ABC Investments, 2008, p. 4).

Figure 2: Composition of fertilizer nutrients off take during 2006-07



Source: NFDC (2007, p. 4)

Balance use of fertilizer is crucial for increasing yield of cotton (Sheikh, 2008). Use of potash and phosphate is much low in Pakistan as compared to several other countries. More particularly, use of potash as a percentage of N consumed in the country is even less than one percent, where as in India it is close to 16 percent [Table 32: Consumption of P2O5 and K2O (as percent of N) in 2002].

Table 32: Consumption of P2O5 and K2O (as percent of N) in 2002

Country	Consumption as percent of N	
	P2O5	K2O
Australia	110.8	23.7
Brazil	154.6	168.4
China	39.0	16.7
World	39.6	27.5
India	38.2	15.7
USA	35.6	41.8
Pakistan	26.5	0.4
Egypt	13.3	5.4

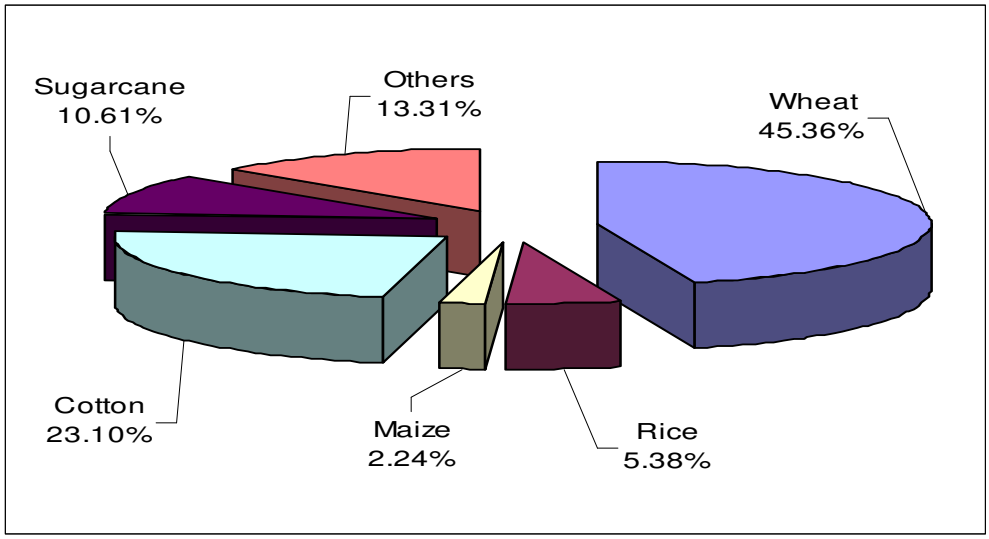
Data source: FAO Statistical Yearbook 2005-2006

Fertilizer consumption by cotton crop

According to Statistical Yearbook 2008, in Pakistan, cotton ranks second in term of the consumption of fertilizer, after wheat crop. Cotton accounts for about 23 percent of the total consumption of fertilizer in a given year in Pakistan (

Figure 3: Crop-wise consumption of fertilizer Figure 6: Import of pesticides in 2006).

Figure 3: Crop-wise consumption of fertilizer



Source: FBS (2008, p. 62)

Ahmad & Rashid (2003) have estimated that one kg of nutrients including N and P produces 3.9 kg of additional cotton. In a survey, they found some progressive farmers who produced 3 to 4 tons of cotton from one hectare by using 80 to 200 kg of N and 28 to 57 kg P2O5 (pp. 83-84).
Nutrient analysis suggests that use of nitrogen crop in Pakistan is at par with that in countries like Australia, USA and China. But Pakistan lags behind most of other countries in phosphate and potash (Table 33: Consumption rate of NPK in Cotton crop). It clearly highlights the problem of non-balanced use of fertilizer in Pakistan. The cotton producing countries having more balanced use of fertilizer are likely to have higher yield of cotton, like Australia, USA and China.

Table 33: Consumption rate of NPK in Cotton crop

Country	Consumption of nutrients in kg /ha		
	N	P	K
Australia	121.2	19.8	12.4
USA	120	60	85
China	120	70	25
Pakistan	120	36	0
India	89.5	22.6	4.8
Brazil	83	130	122
Egypt	53.6	57.1	57.1

Source: FAO FertiStat (http://www.fao.org/ag/agl/fertistat)

Fertilizer promotional programmes

Fouji Fertilizer Company (FFC) publishes a quarterly newsletter "Zari Report" which was distributed to 24,000 farmers and related organizations during 2006-07. During the same year, FFC contacted 70,804 farmers throughout the country (NFDC, 2007, pp. 38-39).

Soil testing facility	Engro	Fauji
Soil testing lab	2	5
Soil samples tested	10496	25,800
Samples analyzed for micro-nutrients	-	1,392

Source: NFDC (2007, pp. 38-39)

Major problems of fertilizer dealers

Survey has revealed that fertilizer dealers are facing several problems.

Shortage of fertilizer

First problem is the shortage of supplies. Only 10 percent of the respondents reported that fertilizer remains available in the market whenever needed. However, 50 percent of the dealers indicated that shortage of fertilizer emerges as an issue at least for some times during a season. Shortage of fertilizer is indeed a serious issue as is evidenced from a news clip contained in Box 1: Farmers protest shortage of fertilizer.

Table 34: How often fertilizer is available in market when there is a peak time for the crop

Fertilizer availability	Frequency	Percent	Cumulative Percent
Never	1	5.0	5.0
Few times	3	15.0	20.0
Some times	10	50.0	70.0
Most of times	4	20.0	90.0
All the times	2	10.0	100.0
Total	20	100.0	

Half of the respondents termed this issue as the top most problem they were facing. Why is there reduction in supply of fertilizers? The respondents assigned 5 reasons to this problem, which include:

- Import of fertilizer less than requirement,
- Delayed import of fertilizers
- Hoarding and black marketing of fertilizer at critical times, especially by the big dealerS and investors
- Less production
- Increasing demand
- Lack of proper distribution in the districts
- Smugglings to Afghanistan

Black marketing becomes possible due to the fact that the number of dealers in each location is very small. So the hoarders can easily manoeuvre the market.

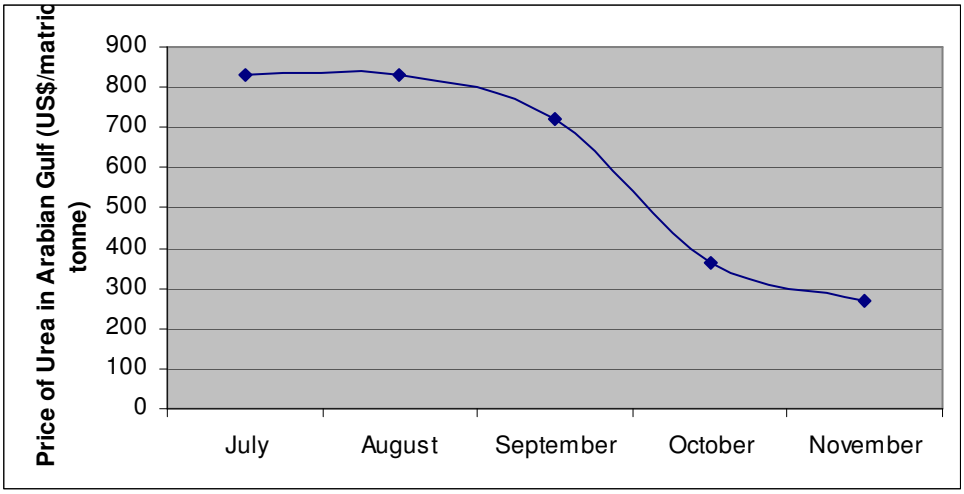
Frequent rises in the prices of fertilizers

Second problem identified by the respondents is the frequent rises in the prices of fertilizers. This is due to black marketing, delay in arrival of the shipment of fertilizer, delayed delivery of fertilizer to the dealers, fluctuation of fertilizer prices in the international market, volatility of the exchange rate etc.

There are some investors in the market who do not have regular businesses in the fertilizer. They enter the market just before the arrival of the critical time of the fertilizer, purchase fertilizer in bulk quantities and stock them. As a result, artificial shortage of fertilizer is created, which push prices of fertilizer upwardly. When they feel that prices have gone beyond an acceptable threshold limit, they sell the fertilizer, make profit and leave the market. This is a real challenge, how to deal with such investors who have malafied intentions and create distortions in the fertilizer market.

As far as international market is concerned, volatility of the prices of fertilizers is very high (Figure 4: Trend in prices of ureas in Arabian Gulf: July-November 2008). For example, in the fourth week of July 2008, price of the one tonne of urea ranged from US$ 825 to US$830 in the market of Arabian Gulf (NFDC, 2008a, p. 8), which plummeted to just US$268 to US$270 in the same market, in the fourth week of November, 2008 (NFDC, 2008b, p. 8).

Figure 4: Trend in prices of ureas in Arabian Gulf: July-November 2008



Source: Fertilizer Reviews of NFDC for the months of August to December, 2008

Conditional business of the fertilizer companies

Third problem was the conditional business of the fertilizer companies with the dealers. Respondents revealed that generally fertilizer companies sell the DAP to dealers with the condition that they also buy urea.

Low profit margin for the dealers

Fourth problem pointed out by the respondents is very low profit margin on the sale of fertilizers. They argued that this is due to the fact that companies offer small percentage of commission on sale. One of the respondents revealed that the companies give them commission at the rate of Rs. 5 to 10 on one bag of fertilizer.

Box 1: Farmers protest shortage of fertilizer

Farmers protest shortage of urea fertilizer

Dawn Report

FAISALABAD, Dec 15: Farmers belonging to villages located on Narwala Road staged a demonstration in Chak-29 on Monday and blocked the road for two hours to protest shortage of fertilizers, particularly urea. PML-N local leaders, including Shehbaz Kissana, who was party ticket holder for NA-81, Dr Hafeez and Rana Khalid led the demonstrators who also burnt tyres to throw traffic out of gear.

Carrying banners and placards and chanting slogans against the district administration and fertilizer dealers, the protesters bemoaned the shortage of fertilizers as well as inaction of the government to clamp down on profiteers and hoarders. Addressing the protesters, Kissana, Qari Ishfaq, Rana Papu and other speakers said that hoarders and profiteers had been fleecing poor farmers without any hindrance. They said it was unfortunate that on the one hand, the government had been spending millions of rupees to mobilise farmers to cultivate more and more wheat, but, on the other hand, it was not taking any step to check black-marketing and shortage of fertilizers.

They said that the shortage of fertilizers would affect the wheat cultivation and all government efforts to avoid its scarcity in the coming season would go down the drain. Kissana said that sufficient stock of fertilizer was available with dealers, however, they had been charging Rs1,000 per bag of urea fertilizer instead of Rs650, the rate prescribed by the government. He said the government should immediately form farmers' committees to distribute fertilizers across the board.

This was second demonstration of its kind held in this district within a week. Earlier, farmers of Jaranwala vent their ire against the black-marketing and shortage of fertilizers by blocking the Faisalabad-Jaranwala Road on Friday. Their demonstration moved the district administration to arrest a few hoarders, however, farmers of Jaranwala tehsil were still running from pillar to the post to get even a single bag of the manure.

VEHARI: Farmers held a demonstration on Khanewal Road on Monday to protest the shortage and black-marketing of urea fertilizer. Growers belonging to Chak 24-WB, 26-WB, 75-WB, 77-WB, 79-WB, 61-WB, 83-WB, 93-WB and 95-WB blocked the road and threw traffic out of gear for quite some time. Addressing the protesters, Malik Nawaz, Ghulam Murtaza, Rashed Gujar, Ch Khadim and Rana Nawaz said the district administration had failed to enforce urea fertilizer's Rs650 per bag price prescribed by the provincial government.

They said dealers were selling a urea bag for Rs950 and that too on the 'recommendation' of district government officials, who were ignoring small growers. They also intercepted a trailer laden with fertilizer bags being transported to the godown of a local dealer. However, the police intervened on which the protesters dispersed.

Meanwhile, DDO (R) Ayub Khan has said a strict action would be taken against dealers flouting the prescribed rates. He also warned dealers of action if they did not display price lists on conspicuous places at their outlets.

Source: Daily Dawn, December 16, 2008.

Difference between booking price and the actual price

Fifth problem is the difference between booking price and the actual price. The respondents indicated that they get fertilizer booked at a certain price, but when delivery is made, they have to pay higher price most of the times.

Risk of fertilizer sale on credit

Sixth problem is the risk associated with sale of fertilizer on credit. The dealers offer sale of fertilizer to farmers on credit but charge very high mark up. If the crop fails, the credit is put at risk.
Only 35 percent of the dealers reported to have sold fertilizer to farmers on credit. However, in none of such cases, the quantity of fertilizer sold on credit did not exceed 50 percent. It ranged from 20 percent to 50 percent with average of about 41 percent.

Table 35: Sale of fertilizer on credit

Mode of sale	Frequency	Percent	Cumulative Percent
On credit	7	35.0	35.0
Totally on Cash	13	65.0	100.0
Total	20	100.0	

Quality of fertilizer

Seventh problem is the quality of fertilizer. In most of the cases, quality problems arise in case of local companies. In some cases, level of fertilizer adulteration rises to even 40 percent. Most of the respondents opined that those people who hoard fertilizer also commit the crime of adulteration and missing of fertilizers. Adulteration of fertilizer is a serious issue. Recently, few steps have been taken to deal with this problem, however, it still exists (**Error! Reference source not found.**).

Table 36: Perceived quality of fertilizer

Quality	Frequency	Percent	Cumulative Percent
Poor	1	5.0	5.0
Good	1	5.0	10.0
Very Good	7	35.0	45.0
Excellent	11	55.0	100.0
Total	20	100.0	

HAILED

Local farmers have welcomed the government proposal to sell the fertilizers and pesticides at utility stores. A cross section of growers in the district has expressed their optimism that if implemented the decision will go a long way in putting an end to the sale of adulterated farm inputs. It will also stop the black marketing and hoarding of the fertilizers.

On the other hand, the district administration has stepped up their crackdown against hoarders of fertilizers.

The deputy district officer (revenue) Jhang, M Haroon Rashid, carried out a raid at a house in Ayub Chowk and recovered 700 bags of urea fertilizers which were sold on the spot to farmers at the prescribed rate of Rs 662 per bag. A criminal case was registered against hoarder Ejaz who was handed over to police.

Source: Daily Dawn, 26 December, 2008 (http://www.dawn.com/2008/12/26/nat33.htm)

Income tax is the eighth problem they are facing. Staff of Income Tax Department pressurized the dealers to reveal more income and pay more taxes.

Suggestions of fertilizer dealers for their problems

They gave following suggestions:

Increase in import of fertilizer

Government should ensure import of sufficient quantity of fertilizer well before arrival of the critical time of its use. This intervention will erode away the incentive of hoarding.

Increase in production of fertilizer

Government should ensure fertilizer factories operate at a reasonable level of capacity and manufacture fertilizer in sufficient quantity.

Increase in profit margins of the dealers

If companies offer appropriate profit margin to the dealers, they will have no reason to enter into arrangements with the investors for hoarding and black marketing.

Intervention of the Government

The Government should properly track the distribution of fertilizer and enact legislation against hoarding and impose huge penalties on the hoarders. Besides, the government agencies should frequently take samples of fertilizers from the market and farmers to examine quality. Strict actions should be taken against those who are found guilty. Instead of black listing the companies, the persons should be black listed. Moreover the government should control prices and smuggling of fertilizers.
Respondents also suggested that the government should not privatize the fertilizer factories.

Sealing of the fertilizer bags

The companies must ensure that the fertilizer bags are properly sealed so that they remains less chance for adulteration in the fertilizers.

Skill gaps of the fertilizer dealers

Survey results lead to the identification of key skill gaps areas, as discussed below:

Lack of Business Management skills

Most of the fertilizer dealers lack entrepreneurship skills. They got into the business without any formal training. Most of the dealers contracted in dealerships only and only on the basis of their contacts in the fertilizer companies. Another common feature of the fertilizers is their background. Most of them are and/or were arhties in the grain markets. They are running the dealerships but not on professional business patterns. They lack skills how to upgrade, expand and/or diversify their business operations. Eventually, some of them indulge into short term illegitimate business activities like hoarding, black marketing and adulteration of the fertilizer at critical times of the crop. It is expected that if they are given training in the entrepreneurship, not only incidence of such problems will significantly reduce but they will also be able to serve the farming sector in better way.

Poor People management skills

In most of the cases, the dealers are having seth style of managing people. A typical seth style of management is characterized as a relationship of master and slave between employee and the employer, violation of the Labour Laws, low wages, higher incidence of terminations, poor working conditions for employees, extended working hours without any additional monetary benefits, and denial of the basic rights to the labour. Moreover, there exists no awareness among the employees, about the labour rights what the Constitution of Pakistan and the labour laws give them.

Inadequate Technical skills

Fertilizer dealers need training in the soil fertility and use of fertilizers. Sometimes, fertilizer dealers also assume the role of extension workers and give technical advices to the farmers on the quantity and method of use of the fertilizers. Importance of capacity enhancement of the fertilizer dealers in the fertility management is also very high because growing deterioration in the fertility of agricultural lands is becoming a serious challenge. If proper training is given to them in these areas, they will be able to serve farmers in better ways.

Poor IT skills

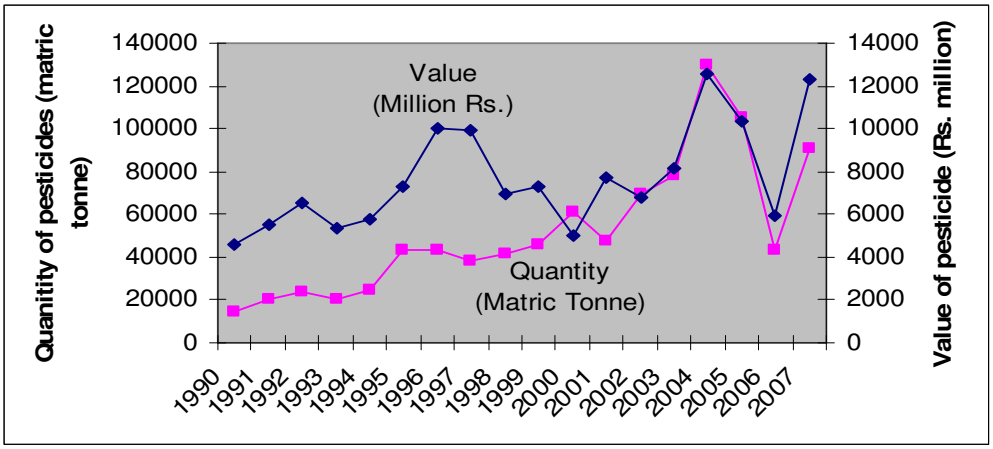
Most of the fertilizer dealers did not have any one in their organizations to have computer proficiency skills. They keep financial and inventory records in old styled registers. Owing to lack of proper record of financial transactions, they often fail to submit the income tax returns in proper ways, eventually, income tax authorities suspect hiding of the income and thus ask the dealers to reveal more income and pay more taxes. It would not be possible to educate the dealers in the use of computers; rather they need awareness about the usage and benefits of the use of computer in the business operations. It will help in increasing tax revenue collection from the fertilizer dealers, creating job opportunities for the computer operators and better management of their business operations.

Pesticides

Overview of the use of pesticides in Pakistan

Use of pesticide in Pakistan began in 1952 (Mazari, 2005). However, it gained boost in early 1990s when the cotton leaf curl virus outbreak in the country and has continued to grow thereafter. Quantity of pesticides used in Pakistan has increased more than 6 times since 1990 (Figure 5: Consumption of pesticides in Pakistan). It increased from 14,743 matric tonnes in 1990 to 90,676 matric tones in 2007. During 2007, value of pesticides consumed in Pakistan during 2007 (January-October) exceeded Rs. 12 billion (Government of Pakistan, 2007, p. 151).

Figure 5: Consumption of pesticides in Pakistan

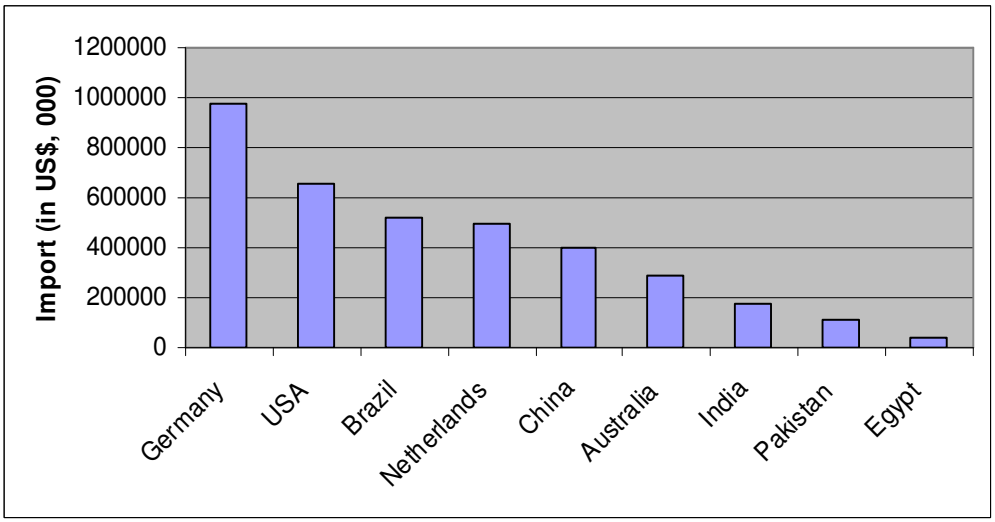


Source: Government of Pakistan (2007, p. 151)

Production of pesticides in Pakistan has gradually increased in Pakistan, therefore, degree of self-reliance has improved over the time during last two decades. Share of import of pesticides in the total consumption in terms of quantity has reduced from over 50 percent in 1990 to mere 17 percent in 2007 (Government of Pakistan, 2007, p. 151).

Nevertheless, Pakistan still stands among the leading importers of the pesticides in the country. Germany is the largest importer of pesticides in the world. During 2006, Germany imported pesticides of worth US$ 975 billion and Pakistan incurred US$ 113 million on this account (Figure 6: Import of pesticides in 2006).

Figure 6: Import of pesticides in 2006



Source: FAOSTAT, 2008

Legislation relating to pesticides

Government of Pakistan enacted Agricultural Pesticides Ordinance (APO) in 1971 with the objective of regulating import, manufacturing, formulation, marketing, and use of pesticides (Mazari, 2005). In 1973, the Government passed a legislation related with specifications of pesticides, known as Agricultural Pesticides Rules, 1973 (Mazari, 2005).

Common pests and diseases of cotton

Respondents from the pesticide dealers reported seven pests which were in their knowledge. None of the pest was in knowledge of all respondents (dealers). Only three pests including jassid, cotton mealy bug, and whitefly were knowledge of more than 50 percent of the respondents (Table 37: Common pests of cotton known to the pesticide dealers).

Table 37: Common pests of cotton known to the pesticide dealers

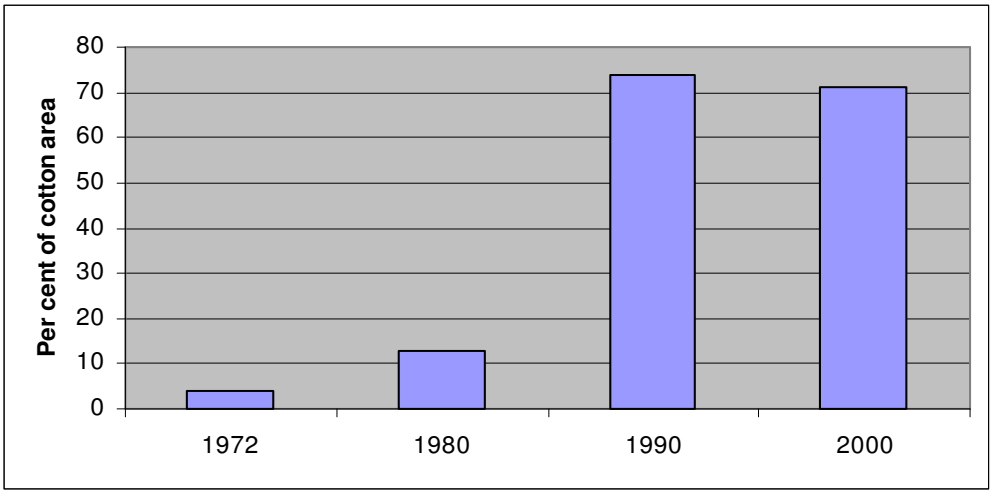
Pests and diseases	No of respondents identified	Percentage
Jassid	14	70
Cotton mealy bug	12	60
Whitefly	12	60
Spotted Boll worm	7	35
Army worm	6	30
Thrips	3	15
Leaf Curl Virus	3	15

Current use of pesticides

Figure 7: Per cent of cotton area covered by plant protection measures, clearly indicates growing use of pesticides in Pakistan. The quantity of pesticides annually used in Pakistan has increased from 915 tons (230 tons active ingredient) in 1981 to 129,000 tons (28,500 tons active ingredient) in 2004 (Mazari, 2005). How much pesticide is used in cotton crop? There is no consensus among various studies and reports. For example, NFDC (2002) has reported that share of cotton crop in the total consumption of pesticide in Pakistan is estimated at 54 percent (p. 13). Mazari (2005) has reported this ratio to be 70 percent and according to Khooharo, Memon, & Mallah (2008, p. 57) it is 80 percent.

Figure of 54 percent seems too low for cotton, as cotton is the single largest pesticide user crop in Pakistan. Moreover, the use of pesticides in cotton has been rising consistently in Pakistan. The present survey has found that number of pesticide sprays go as high as 13 in some cases (Table 38: Number of pesticide sprays). This finding is in concurrence with other studies. For example, Khan et al (2002) have reported that number of sprays in cotton rose from just two in 1988 to 11 in 2001.

Figure 7: Per cent of cotton area covered by plant protection measures



Source: Agricultural Census Organization (Agricultural Census, 1972, 1980, 1990 and 2000) <http://www.statpak.gov.pk/depts/aco/publications/emerging_trends.pdf>

Similarly, 80 percent appears to be a bit on higher side, as in recent times, consumption of pesticides in other crops like wheat and rice has significantly risen, so around 70 percent ratio is expected to be closer to actual figures.
Various categories of pesticides include insecticides, fungicides, herbicides, etc. Insecticides accounts for about 88 percent of the total pesticide consumption (NFDC, 2002, p. 14)

Table 38: Number of pesticide sprays

No. of spray	N	Minimum	Maximum	Mean	Std. Deviation
Maximum sprays	20	4	13	8.70	2.408
Minimum sprays	20	2	8	4.85	1.496

Sale of pesticides on Credit

Sale of pesticides is very common in the local pesticide retail markets. About 95 percent of the pesticide dealers reported that they were selling pesticides on credit. Volume of such transactions is very high. In 45 percent cases, share of sale on credit exceeded 50 percent (Table 39: Sale of pesticides of Credit). Share of sale on credit in the total value of sales ranged from 30 percent to 90 percent of the total sale value, with average of around 54 percent (Standard Deviation = 22.99). These statistics reveal that farmers severely lack adequate resources to purchase inputs, eventually; they resort to the dealers for purchase of inputs like pesticides on credit.

Table 39: Sale of pesticides of Credit

Sale on credit (percent)	Frequency	Percent	Cumulative Percent
Zero	1	5.0	5.0
1 – 30	4	20.0	25.0
31 – 50	6	30.0	55.0
51 – 70	5	25.0	80.0
Above 70	4	20.0	100.0
Total	20	100.0	

Major problems of pesticides dealers

Only 5 percent of the respondents from the pesticide dealers informed that they were not having any problem. Problems identified by rest of the respondents are discussed below:

Direct marketing of the companies

The companies some times sell their products directly to the farmers. Either farmers approach them or they approach the farmers. The companies charge less rates so when the same farmer contact the dealers, they expect same prices. Eventually, they insist upon the dealers to give same treatment. This way, they loose customers. The respondents suggested that companies should abandon the policy of selling their products directly to the farmers.

Low quality products

Availability of substandard products in the market is a serious issue. Adulteration problem is more severe in remote areas. When farmers purchase pesticides on cash, they are more likely to get standard (quality) product. On the other hand, when they purchase on credit, mostly, they are given substandard products. Generic companies offer very low price products while prices of the branded products (of MNCs) are relatively very high. Though, in most of the cases, generic products do not meet the quality requirements, yet most of the farmers demand cheaper products ignoring the dimension of quality. This phenomenon triggers a price war among the companies.

Share of local formulation in the total supply of pesticides in the country has risen from mere 14% in 1984 to about 70% in 2004 (Mazari, 2005).

Table 40: Quality of the products available in the market

Quality level	Frequency	Percent	Cumulative Percent
Good	11	55.0	55.0
Very Good	5	25.0	80.0
Excellent	4	20.0	100.0
Total	20	100.0	

Only one fourth of the respondents reported that adulteration of pesticides is not an issue. They opined that this problem does not exist to an extent that someone should be bothered about it. On the other hand 15 percent of the respondents termed this problem as a serious issue in the cotton producing region.

Table 41: Level of adulteration of pesticides available in the market

Adulteration level	Frequency	Percent	Cumulative Percent
Not an issue	5	25.0	25.0
Little issue	4	20.0	45.0
Some what an issue	8	40.0	85.0
Serious issue	3	15.0	100.0
Total	20	100.0	

What should be done to deal with the issue of pesticides adulteration? Respondents suggested that:

- Companies which import quality products should ensure supply of the products in time because when quality products vanish from the market, it creates an opportunity for the substandard products to fill the vacuum.
- Strict legal action should be taken against the companies supplying sub-standard products in the market.
- Capacity of farmers should be built in how to differentiate between standard and non-standard products and in how and when to apply which types of pesticides.
- Government should make anti-adulteration laws, which should be very strict.
- PPP should monitor the quality not only in the market but also at field level, because in some cases, as discussed earlier, companies sell products directly to the farmer, by bypassing the dealers.
- Credit sale should be discouraged by facilitating the farmers to access easy and cheap credit from the banks.

Recovery from the farmers

A significant proportion of farmers get pesticides on credit from the dealers with the agreement that after harvest of the crop, the farmers will pay back the price to dealers. It is a difficult task to recover money from the farmers, especially from those farmers whose crop has not been healthy.

The respondents suggested that ZTBL and other commercial banks who lend money to the farmers should review their credit policies and make them more farmer-friendly so that farmers can approach them for seeking credit to buy pesticides. As a result, dealers will be able to resolve the recovery problems. Moreover, they will be able to overcome financial constraints.

Inappropriate use of pesticides

A large number of farmers purchase and use pesticides on self prescription basis without any proper diagnosis of the disease or infestation. As a result, in most of the cases, their treatment fails to achieve the objective. In such cases, farmers approach the dealers and complain about quality of the pesticides. In some cases, they also purchase certain pesticide products on the advice of pesticide dealers as well. Most of the dealers lack formal education or training in plant protection, so their advices mostly turn out to be inappropriate and fail to address the problem.

Threat of Raids

Officials of Agriculture Department launch raids on the dealer shops and take samples of the pesticide products, which are sent to lab for tests. If samples do not qualify the tests of quality, then legal action is taken against the dealers. However, no action is taken against the concerned companies. In case sample is found good, then report of test results is never conveyed to the concerned dealers.

The pesticide dealers suggested that:

The concerned government departments should take action against the companies, in case their products do not meet the minimum quality standards instead of penalizing the pesticide companies.
Test reports should be given to the dealers, whether tests are positive or negative.
During the process of formulating policies regarding pesticides, comments should also be sought from farmers, dealers and pesticide companies.
Officers of the Provincial Agriculture Departments are designed as inspectors who carried out inspection of the dealer shop to take samples under Agricultural Pesticides Rules, 1973. In 2005, there were 232 inspectors in Punjab Province, 74 in Sindh Province, 157 in NWFP, 92 in Balochistan Province, and 15 in the Federal Government (Mazari, 2005). There are 39 testing labs in the country, 10 in public sector and 29 in private sector (Mazari, 2005).

Shortage of finances

Around 20 percent of the respondents highlighted that they are facing shortage of capital and they do not have access to any credit facility. They suggested that ZTBL should extent the credit facility to the pesticide dealers also.

Shortage of pesticides

Some of the branded pesticide products disappear from the market during the critical time of the cotton crop. Only 10 percent of the respondents reported that pesticides remain available in the market for the farmers, whenever, they need.

Table 42: How often pesticides are available in market when required for the crop?

Pesticides availability	Frequency	Percent	Cumulative Percent
Never	1	5.0	5.0
Few times	3	15.0	20.0
Sometimes	10	50.0	70.0
Most of times	4	20.0	90.0
All the time	2	10.0	100.0
Total	20	100.0	

What are reasons for the shortage of pesticides during peak season? Survey has identified several reasons as given below:

- Black marketing: Black marketing. Some of the investors and dealers create artificial shortage so as to give artificial boost to the prices and thus make abnormal profits. Sometimes, the company supplies the product in huge quantity to only few dealers. (6)
- Outbreak of certain pests or diseases: In a situation when pests and diseases attack increases beyond a certain limit, or some unexpected diseases outbreaks, then demand of the pesticides shoot up which results in the shortage of certain pesticide products in the markets. For example, during the current season, jassid massively attacked the cotton crop, which was not expected. (5)
- Delay in supply of a product: Delay in supply of a product for few days could be another reason for the shortage of pesticides. This could be due many reasons. For example, the company is short of inventory. Shipment has delayed. Packing is delayed. (3)
- Purchase of pesticides in bulk: Big farmers buy those products in bulk quantity (1)
- Manipulation of market by the sales staff of companies: Sales staff of a pesticide company temporarily reduces supply of a product and then spreads rumour of the shortage of pesticides in the market (1)

What should be done to deal with issue of pesticides shortage during critical times of the crop? The respondents gave following suggestions:

The government should impose binding on the companies to sell their products to only dealers.
Plant Protection Department (PPP) should monitor at production level and update how many and how much products available and ho much consumed. PPP should do forecasting of the requirements of pesticides in a given season.
Private sector should be encouraged through incentives to invest in the setting up more formulation plants in Pakistan.

Perceived knowledge of the pesticide dealers

None of the respondents rated their knowledge about cotton pests and diseases as poor or very poor. A majority (70 percent) of the respondents termed their knowledge from good to excellent (Table 43: Perceived knowledge of the pesticide dealers about pests and diseases of cotton).

Table 43: Perceived knowledge of the pesticide dealers about pests and diseases of cotton

Knowledge level	Frequency	Percent	Cumulative Percent
Satisfactory	6	30.0	30.0
Good	6	30.0	60.0
Excellent	8	40.0	100.0
Total	20	100.0	

Skill gaps of the pesticide dealers

Survey results lead to the identification of key skill gaps areas for the pesticide dealers, as discussed below:

Poor handling and use of pesticides practices

Health hazardous implications of the indiscriminate and inappropriate use of pesticides are very grave in a society where literacy rate is very low. Incidences of mishandling and inappropriate use of the pesticides are very common. Most of the times, the labour employed on the task of applying pesticide sprays do not take precautionary measures before, during and after doing it. It eventuates into undesired consequences. Moreover, pesticides are usually available in the homes of the

farmers during the cotton crop season, therefore, sometimes, easy access to the poison results in commitment of the suicides (
Box 2: Commitment of suicide). There are only few studies available on this issue. On of such studies was undertaken by Bunggush & Anwar (2000). They surveyed 30 hospitals and 42 Rural Health Units in Pakistan and found 408 cases of poisoning, out of which 206 were accidental and remaining 243 were suicidal. The study was carried out around 10 years back, it is appreciated that current magnitude of problem would be much higher.
Such carelessness is mostly attributed to lack of knowledge and awareness about the seriousness of issue. Pesticide dealers are the persons who remain in direct and frequent contact with the cotton growers, so capacity building of the pesticide dealers is essentially needed in how to handle, store and use the pesticides. Then they should be asked to create awareness on this issue among the farmers as well.

Box 2: Commitment of suicide

Girl, lover commit suicide

VEHARI, Oct 20: A girl and her lover committed suicide together by taking poison in Daniyal Town on Saturday.
Relatives said Shehzadi Kanwal (18) and Umair Jamil (22) wanted to tie the knot, but their families did not agree. In disappointment, they took poison to end their lives. They died on their way to the hospital.—Correspondent

Source: Daily Dawn, October 21, 2007 (http://www.dawn.com/2007/10/21/nat43.htm)

Poor Business Management skills

Almost same situation was found with respect to business skills of pesticide dealers, as has been discussed in case of fertilizer dealers.

People management skills

Pesticide dealers also need orientations and training in the people management skills on the same pattern as has been discussed in case of fertilizer dealers.

Inadequate Technical skills

Knowledge of most of the pesticide dealers about the cotton pests is very limited as is evident from the results given in Table 37: Common pests of cotton known to the pesticide dealers.
So pesticide dealers need training in the diagnosis of the diseases and identification of the pests, and basics of plant protection measures. Plant Protection Department should make arrangement for the rigorous training of the dealers in plant protection.

Poor IT skills

IT skills are also need to be promoted among the pesticide dealers, for facilitating them in the business operations.

Conclusion

All the input suppliers of the cotton crop have several important skill gap areas. Fertilizer dealers and the pesticide dealers have some common skill gaps like business skills, people management skills and IT skills. They do differ in some areas. Pesticide dealers need capacity building in diagnostic skills and plant protection measures. They also require more awareness relating to health issues related with use and handling of pesticides.

On the other hand, fertilizer dealers need capacity enhancement in soil health management, and use of fertilizers. So a common capacity building strategy can be devised both types of the dealers.

On the other hand, Extension Workers have slightly different training needs, so their capacity building strategy should be evolved separately. They have different orientations from the dealers on many accounts. First, Extension Workers have non-profit motives, but the activities and attitudes of dealers are driven by the profit motives. Secondly, both groups operate in different paradigms i.e. public sector and the private sector.

Capacity building of all these groups will not only lead to improvement in the quality and yield of the cotton crop, but will also bring improvement in the business sector in general and the farming sector in particular. Obviously, such interventions are expected to create more job opportunities, and high income for the people associated with the farming sector. So capacity building of input supplier can help in alleviating poverty and improving livelihood.

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Annex 1:
Attach Department/Directorate/Autonomous Bodies of the Department of Agriculture, Punjab

Directorates
Directorate General of Agriculture (Extension & Adaptive Research),
Directorate General of Agriculture (Research),
Directorate General of Agriculture (On Farm Water Management),
Directorate General of Agriculture (Field),
Directorate General of Agriculture (Pest Warning & Quality Control),
Directorate of Agriculture (Floriculture),
Directorate of Agriculture (Information),
Directorate of Agriculture (Economics & Marketing), and
Directorate of Agriculture (Crop Reporting Service)]

Cells
Planning & Evaluation Cell
WTO Cell

Universities
University of Agriculture, Faisalabad
Pir Mehr Ali Shah University of Arid Agriculture Rawalpindi

Others
Regional Agriculture & Economic Development Center (RAEDC) Vehari
Punjab Seed Corporation
Punjab Agriculture Research Board (PARB)
Punjab Agriculture Marketing Co. (PAMCO)
R&D Companies

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