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The Utilization of Improved Farming Technology in District Peshawar,Khyber Pakhtunkhuwa-Pakistan

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Abstract
This study was designed with the main objectives the utilization of improved farming technology in district Peshawar during 2010. Results of the study revealed that majority of the respondents were in the age of 36-50 years. Most (55%) of the farmers were illiterate. Among literate 45% respondents, most (20%) of the respondents were having low level of education. Wheat and maize were the major crops grown by the farmers in the area. Majority (77.5%) of the respondents were getting water from water channels to their fields having poor condition. Majority (72.5%) of the respondents had no linkages with the government departments having no advantages from coupling as reported by 92.5% of the respondents. Majorities (62.5%) of the respondents were unaware about the adoption of modern agriculture technology and they said for non assistance by government to the farmers. Creation of knowledge was stated by most (60%) of the respondents among farmers about modern agriculture. Main problems were: poor literacy level, lack of technical knowledge; poor economic conditions of farmers; no linkages of farmers with government departments, government negligence, and lack of training and unavailability of loans. It is suggested that farmers should make more use of modern agriculture machinery in their fields. Government should be imparted enlarge association with farmers to solve their problems on their door step. Availability of easy loans and training programmes for awareness about latest agriculture machinery and farming practices is recommended.
Keywords: Farming Technology, Major Crops, Economic Condition, District Peshawar

INTRODUCTION

Since independence Pakistan has an agricultural economy. Nearly 70% of the country populations live in rural areas and most of them depend, directly or indirectly, on agriculture. The contribution of agriculture in overall economy of the country is as high as about 22% of the GDP. This sector provides employment opportunities to about 45% of the active labor force. It also contributes to foreign exchange earnings, provides raw material to most of the manufacturing industries (Government of Pakistan, 2009).This sector includes mainly crops, forest, poultry and livestock.

Peshawar, the capital of Khyber Pakhtunkhwa is being known as "Frontier City" standing right at the arrival of the world famous, Khyber Pass. It holds the key to the gateway of the sub-continent. A mention of the city of Peshawar is found in the history written as far back as 400 A.D. The district lies between 33°, 44 and 34°, 15 North latitudes and 71°, 22 and 71°, 42 East longitudes. The total area of the district is 1,257 square kilometers. The district is almost a prolific plain. The central part of the district consists of fine alluvial deposits. The cultivated area consist of a rich, light and penetrable soil, composed of a pretty even mixture of clay and sand, which is good for cultivation of wheat, maize, sugarcane and tobacco. As our focus is on Agriculture Modern Technology, so we discuss this sector briefly.

Modern Technology can be seen as the process by which humans modify nature to meet their needs and want. This position approximate Hornby, (2000) view that Technology can be defined as the scientific study and use of mechanical arts and applied science and application of these two practical tasks in industries. Olayide (1980) also defined technology as the systematic application and collective human rationality to the solution of the problems through the assertion of control over nature and all kinds of human processes. Atala (2002) defined technology as an organized capacity for some purposive activity.

The definitions above suggest that agricultural technology include both components and processes of agricultural production. These processes may include; production of plant and animal breeding (including biotechnology), the introduction of new crops, livestock and fisheries, mechanization, infrastructural development and inputs. The important factors that may contribute to a higher agricultural growth include expansion in cultivated area, enhanced use of water and other agricultural inputs, increase in cropping intensity,

technological change, and technical efficiency. Various studies show a positive growth in total factor productivity for agriculture in Pakistan. However, the estimates differ widely and range from 0.37 [Kemal et. al 2002] over the period 1964-2001 to 2.3 [Ali 2000] for the period 1960-1995. Chaudhry et al (1996) estimated a total factor productivity growth of 0.48 for crop sub-sector over the period 1950-1995; the growth in aggregated inputs accounted for about 80 percent of the total increase in crop output growth and the rest was contributed by improvement in agricultural technology.

Today the great challenge to agriculture in Pakistan is technology transfer. To meet this challenge along side with extension workers, radio and TV could play their role very effectively. Radio and TV communication has proved the most powerful force for social and technological change in developing countries, as well as in developed countries in developing countries radio and TV are especially important as sources of agricultural news and technology dissemination (Behrens and Evans, 1984).

Despite these challenges, agricultural technology has played a central role in overcoming food security challenges in the past. The 20th Century marked a time of significant public investments in scientific research that contributed to historical increases in food production. Coined the Green Revolution, Norman Borlaug's discoveries contributed to historical increases in food production during a time of widespread hunger and malnutrition. For example, the adoption of high-yielding varieties of rice and wheat, the expansion of irrigation infrastructure, and the use of other inputs more than doubled cereal production in Asia between 1970 and 1995.9 as yields increased, farmers quickly adopted these technologies, resulting in increased profitably and incomes. By 1995, real per capita income nearly doubled in Asia and poverty declined from nearly three out of every five to less than one in three. Agriculture's footprint on our ecosystem is substantial. In fact, agriculture consumes 70 percent of our world's water for the irrigation of crops.30 However; advancements in agriculture technology are an important contributor to a more sustainable agriculture system that promotes continuous improvement and less resource use. Scientists are developing seeds that are better adapted for volatile climates and that are drought resistant, as well as technology that uses less water and improves upon modern irrigation practices. Investment in agricultural innovation is necessary to enable the world to produce more food with fewer resources and less land. (Dupont)

Objectives

1. To determine the role of different factors affecting input levels among the farmers.
2. To study the factors constraining the rate of dispersing of new agricultural technology among the farming community.
3. To know the attitude of farmers about the adoption of improved agro practices.
4. To formulate the suggestions and recommendation for policy makers.

MATERIALS AND METHODS

The present study was undertaken to examine the utilization of improved farming technology and its role in agriculture productivity in district Peshawar during 2010. Peshawar district is famous for wheat, Maize, Sugarcane and all types of vegetables and fruits production. Climatic conditions are also favorable for agricultural production but still the agriculture has not reached to satisfactory level due to lack of adoption of new agricultural technologies. For these purpose two villages from district Peshawar i.e. Naguman and Nasapa Payan were selected randomly. After selection of the villages a list of farmers was obtained from the local Agriculture Officer for each village. By using the random number table, a total sample of 40 farmers, 20 farmers from each village were selected.

A questionnaire was prepared and used as a research instrument for the collection of data for this study. Efforts were made to design the questionnaire in such a way as to cover all the important and relevant information about the study. The questionnaire was pre-tested in order to check its reliability and validity. Some of the questions were added, changed or modified, as a result of pre-testing. Although the questionnaire was in English but the questions were asked in local language Pushto.

The data were collected during 2010. During interview every effort was made to explain the questions and its purpose, so as to gather correct and reliable information. The time of each interview was fixed as per convenience of the respondents.

The interviews of the respondents were carried out in the study area in their homes and fields. First the objectives of the study were explained to them and every effort was made to create a relaxed atmosphere in which the farmer could feel free to express himself and give correct responses during the interview. Simple mathematical techniques such as percentages and average were used to analyze the collected data.

The data was collected in the field and transferred to Microsoft excel for initial analysis and after that detailed analysis was carried out using standard statistical tools like SPSS and Statistics in which necessary test was adopted for acquiring required results. After the collection of data through the questionnaire the primary data was analyzed through SPSS and MS Excel. Data was presented in average and percentage form and Chi

Square test was used.
$\chi 2 = \sum (E-O)\ 2/\ E$
Chi Square Test as defined as:
Here,
O= Observed Frequency
E= Expected Frequency
∑= Summation
X2 = Chi Square Value

Results and Discussion

4.1 Age of Respondents

Age of a person is known to have direct bearing upon his attitude towards observing and tackling the idea or things that happen to come in the sphere of his experience. It also plays an important role in the adoption or rejection of a practice. Data regarding the age of the respondents is given in Table 4.1.

Age of the respondents is classified in to three groups (a) from 20-35 years (b) from 36-50 years and (c) from 51-65 years. It is evident from the data that in village Naguman, most of the respondents (65%) were between 36-50 years of age, 15% w e r e between 20 -35 years, while 20% respondents were having the age of 51-65 years. In village Nasapa Payan, 20% of the sample respondents were between 20-35 years of age. Seventy percent were between 36-50 years, while 10% respondents were between 51-65 years of age.

In the whole study area, most of the respondents (68%) were between 36-50 years of age, 1 7% of the sample respondents were between 20-35 years, while 15% of the respondents were between 51-65 years of age. From the data it is revealed that majority of the sample respondents were middle aged having 36-50 years of age.

Table 4.1 Distribution of sample respondents on the basis of age

Villages	Age group			Total
	20-35	36-50	51-65	
Naguman	3 **(15)**	13 (65)	4 (20)	20 (100)
Nasapa Payan	**4** **(20)**	14 (70)	2 (10)	20 (100)
Total	**7** **(17)**	27 (68)	6 (15)	40 (100)

Source: Field Survey.
Note: Figures in parentheses show percentages.

4.2 Literacy Status and Level of Education

Education plays a vital role in the adoption of improved farming technology because a literate person is considered to be more effective and have greater capacity to learn and accept new ideas. It is believed that higher the level of literacy status better will be output in terms of changed behaviour.

Table 4.2 reveals that 60% and 50% of the sample respondents in Naguman and Nasapa Payan were illiterate, respectively. In village Naguman, 15%, 5%, 10% and 10% of the sample respondents were educated up to primary, middle, matric and intermediate level, respectively.

In Nasapa Payan, 25%, 10%, 10% and 5% of the respondents were having primary, middle, matric and intermediate education. In selected respondents of Naguman and Nasapa Payan, only 5% of the sample respondents were graduate in Naguman.

The data also shows that above half (55%) of the total respondents were illiterate, while 45% were literate. Among literate 45 respondents, 20% were having primary, 7.5% were having middle, 10% were having matric, 5% were having intermediate and 2.5% were having graduation level of education. The reason for illiteracy was the lack of educational institutions, poor financial conditions and lack of awareness about education.

The results were earlier confirmed by Shahid and Shaukat (2001) who stated that the reasons for low level of literacy are lack of educational institution, poor financial conditions and lack of awareness about education.

Table4.2 Distribution of the sample respondents according to their level of education

Villages	Education level						Total
	Illiterate	Primary	Middle	Matric	Inter	Graduate	
Naguman	12 (60)	3 (5)	1 (5)	2 (10)	2 (10)	-	20 (100)
Nasapa Payan	10 (50)	5 (25)	2 (10)	2 (10)	1 (5)	-	20 (100)
Total	22 (55)	8 (20)	3 (7.5)	4 (10)	3 (7.5)	-	40 (100)

Source: Field Survey.
Note: Figures in parentheses show percentages.

4.3 Agricultural Crops Grown by the Respondents

Agriculture is the mainstay of Pakistan's economy and it remains the dominant source of employment in Pakistan. More than two thirds of Pakistan's population live in rural areas and their livelihood continue to revolve around agriculture and allied activities (Federal Bureau of Statistics, Islamabad, 2000-2008). Table 4.3 shows that in village Naguman, 25% of the sample respondents were growing maize, 45% were growing wheat, 20% were cultivating sugarcane and 10% of the sample respondents were growing vegetables. In village Nasapa Payan, out of total 20 respondents, 20% of the sample respondents were growing maize, 35% were growing wheat, 15% were sowing sugarcane and 20% of the sample respondents were growing vegetables.

The table shows that wheat is the main agriculture crop grown by respondents in the area. In the whole study area, 40% of the sample respondents were growing wheat, 27.5% were cultivating maize, 17.5% were growing sugarcane, while 15% of the sample respondents were sowing vegetables. Zulfiqar (2003) reported that training is a basic need for improving yield production.

Table4.3 Distribution of the sample respondents according to agric. crops in the area

Villages	Maize	Wheat	Sugarcane	Vegetables	Total
Naguman	5 (25)	9 (45)	4 (20)	2 (10)	20 (100)
Nasapa Payan	6 (30)	7 (35)	3 (15)	4 (20)	20 (100)
Total	11 (27.5)	16 (40)	7 (17.5)	6 (15)	40 (100)

Source: Field Survey.
Note: Figures in parentheses show percentages.

4.4 Source of Irrigation Water in the Villages

Table 4.4 reveals that in village Naguman, out of total 20 respondents, 5% of the sample respondents were having barani land for irrigation. Twenty percent of the respondents were giving water to their fields from tube well. Most (75%) of the respondents were having the source of water channels for irrigation. In village Nasapa Payan, 5% of the sample respondents were having barani fields, 15% were depended on tube well, while 80% of the sample respondents were irrigating their fields by water channels.

The data shows that majority 177.5%) of the respondents in both villages were having the source of water channels to their fields. Five percent respondents were depend on rain water, while 1 7.5% were irrigating their land by tube wells.

Table 4.4 Distribution of the sample respondents according to irrigation source of water in the villages.

Villages	Barani	Tubewell	Water channel	Total
Naguman	1 (5)	4 (20)	15 (75)	20 (100)
Nasapa Payan	1 (5)	3 (15)	16 (80)	20 (100)
Total	2 (5)	7 (17.5)	31 (77.5)	40 (100)

Source: Field Survey.
Note: Figures in parentheses show percentages.

4.5 Linkages of Respondents with Government Departments

The data in table 4.5 presents the privilege of linkages between respondents and government departments. It is evident from the data that in village Naguman, most (70%) of the sample respondents had no linkages with government departments. Fifteen percent respondents said that they had linkages with agriculture extension department, 10% respondents were linked with water management, while 5% of the sample respondents were linked with rural development department. In village Nasapa Payan, majority (75%) of the sample respondents said that they had no link with government departments. Ten percent of the sample respondents were linked each with agriculture extension and water management. Five percent of the respondents were linked with rural development.

The data shows that majority (72.5%) of the respondents in both the villages had no linkage with the government departments. Linkages of the respondents among agriculture extension (12.5%), water management (10%) and rural development (5%) were noted in the study area.

Table 4.5 Distribution of the sample respondents on the basis of linkages with Government Departments

Villages	Linkages of respondents with government departments				Total
	A	B	C	D	
Naguman	14 (70)	3 (15)	2 (10)	1 (5)	20 (100)
Nasapa Payan	15 (75)	2 (10)	2 (10)	1 (5)	20 (100)
Total	29 (72.5)	5 (12.5)	4 (10)	2 (5)	40 (100)

Source: Field Survey.
Note: Figures in parentheses show percentages.
A. No linkages
B. Agriculture Extension
C. Water Management
D. Rural Development
E. Benefits Got From These Linkages

4.6 Nature of Information They Need Most of the Times

The data presented in Table 4.6 shows that in village Naguman, 70% of the respondents required information for modern machinery, 10% for timely information about use of fertilizer, 15% for field management and 5% of the respondents wanted information about pest control. In village Nasapa Payan, 65% of the respondents demanded information for recent machinery, 15% for information about use of fertilizer and 10% of the respondents requested for information about field management and pest control.

The data collected from both the villages reveal that most (67.5%) of the respondents were requesting for information about modern machinery, 12.5% were requesting for information about use of fertilizer and field management, while 7.5% of the respondents requested for information about pest control. All the respondents wished to improve their knowledge and skill about modern agriculture. Khan (1995) reported that respondents have got the information about modern farming practices through extension workers.

Table 4.6 Distribution of sample respondents by nature of information they need most of the times

Villages	Information most of the times required by farmers				Total
	A	B	C	D	
Naguman	14 (70)	2 (10)	3 115)	1 (5)	20 (100)
Nasapa Payan	13 (65)	3 (15)	2 (10)	2 (10)	20 (100)
Total	27 (67.5)	5 (12.5)	5 (12.5)	3 (7.5)	40 (100)

Source: Survey.
Note: Figures in parentheses show percentages.
A. Modern machinery
B. Use of fertilizer
C. Field management
D. Pest control

4.7 Suggestions for Assistance by the Respondents

The data given in Table 4.7 describes the suggestion furnished by the respondents for assistance. It is evident from the table that in village Naguman, 50% of the sample respondents said for the creation of awareness among farmers about modern tactics of agriculture. Twenty percent respondents called for increased linkages between farmers and government agriculture related staff and provision of without profit funds to the farmers for agriculture. Ten percent respondents asked for encouragement of devoted people for their work. In village Nasapa Payan, 70% of the sample respondents said for the nature of awareness among farmers about modern approaches of agriculture. Fifteen percent respondents called for increased linkages between farmers and government agriculture related staff, 10% said for encouragement of devoted people and 5% of the sample respondents asked for availability of without profit funds to the farmers for agriculture.

The data shows that out of total 40 respondents, 60% of the sample respondents said for the creation of knowledge among farmers about modern agriculture. Increased linkages between farmers and government departments were sated by 17.5% respondents , 10% said for encouragement of devoted people and 12.5% respondents asked for availability of without profit funds to the farmers for agriculture.

Table 4.7 Distribution of sample respondents on the basis of suggestions for assistance

Villages	Suggestions for assistance				Total
	A	B	C	D	
Naguman	10 (50)	4 (20)	2 (10)	4 (20)	20 (100)
Nasapa Payan	14 (70)	3 (15)	2 (10)	1 (5)	20 (100)
Total	24 (60)	7 (17.5)	4 (10)	5 (12.5)	40 (100)

Source: Survey.
Note: Figures in parentheses show percentages.
A. Creation of awareness among farmers about modern tactics of agriculture.
B. Increased linkages between farmers and government agriculture related staff.
C. Encouragement of devoted people for their work.
D. Availability of without profit funds to the farmers for agriculture.

4.8 Problems Faced by Respondents in their Fields

Farmers generally face many problems in their fields including unawareness, indigent financial position, poor water channel, non availability of fertilizers and many others. Since the land holding capacity of the farmers of this area is low, therefore, all available land was utilized by the farmers and during survey no barren land was observed. Table 4.8 show that out of 20 respondents in village Naguman, 65% of the respondents were unaware about modern agriculture, 20% were pressed by poor financial condition, 10% were faced with poor water channel, while 5% of the respondents were faced with non availability of timely fertilizers. In village Nasapa Payan, 60% of the respondents were oblivious about modern agriculture, 15% were faced with each financial destitution and poor water channels. Ten percent of the respondents were faced with fertilizer obstacles.

The data shows that majority (62.5%) of the respondents were unaware about the adoption of modern agriculture technology. Needy financial position and indigent water channel were stated by 12.5%, while 7.5% of the respondents were facedby insufficient availability of timely fertilizers.

Table4.8: Distribution of the sample respondents according to faced by problems in their field

Villages	A	B_	C	D	Total
Naguman	13 (65)	4 (20)	2 (10)	1 (5)	20 (100)
Nasapa Payan	12 (60)	3 (15)	3 (15)	2 **(10)**	20 (100)
Total	25 (62.5)	7 (17.5)	5 (12.5)	3 (7.5)	40 (100)

Source: Field Survey.
Note: Figures in parentheses show percentages.

A . Unawareness about modern agriculture
B . Poor financial condition
C . Poor water channel
D . Non availability of timely fertilizer

CONCLUSION AND RECOMMENDATIONS

The results of the present study show that the agriculture modern technologies transfer and agricultural extension worker's role was appeared not very impressive. There are many reasons for insufficient and inadequate use of inputs; like land size, literacy ratio, poor agriculture extension services and provision of training, poor financial conditions of farmers, lack of modern agro-technical practices, poor utilization of the available resources, low credit to farmers, hesitation towards adoption of new techniques, unawareness about inputs and their unavailability like fertilizers, irrigation water, pesticides, improved seed varieties, advanced agriculture machinery, poor information sources, government top down programs and many other constraints are faced by farmers. Adoption of improved farm practices and modern technology by the farmers is the only mean of increasing production. The word modern agricultural technology includes all innovations and improvements in mechanism designed to increase crop production or improve the quality of end products. In agriculture, use of high yielding varieties, proper and timely use of chemical fertilizers, advanced agricultural machinery, use of water resources, updated agricultural information, integrated pest management and proper use of postharvest technology can increase the production of crops. Poor linkage between the farmers and line departments/government is a major cause of low production. Therefore, there is a dire need to motivate farmers to keep them abreast with t he la test a gricultural techniques. This study is an exertion in this regard to evaluate estimating the utilization of improved farming technology in the study area among the farmers.

Recommendations

On the basis of conclusions given above, the following recommendations can be endorsed.

1.The production of farmers in agriculture can be increased, if they make more use of modern agriculture machinery in their fields.
2. Government department should be imparted linkages with farmers to solve their problems on their door step.
3.Training facilities through agricultural extension department should be provided which must educate them about proper and timely use of fertilizers.
4.Farmers must be dispensed with latest agriculture machinery by providing loans or machinery on soft terms and conditions.
5.Farmers must be trained for awareness about modern farming technology and their importance in agriculture field.

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