IMPACT OF EDUCATION ON DIFFUSION OF DATES PALM ORCHARDS IN NORTHWEST PAKISTAN

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ABSTRACT

Education is one of the most important factors for diffusion of new agricultural practices by farmers to minimize cost of production and maximize productivity as well as net benefits. This study was carried out in 2007 in southern parts (Dera Ismail Khan and North Waziristan Agency) of the Northwest Pakistan with the purpose to investigate the causes of late adoption and slow diffusion of date palm cultivation; and to examine the role of education for timely diffusion of date palm cultivation in the area. The results of the study show that education has an influencing role on timely adoption of date palm cultivation. Similarly, farmers with less or no education were found late adopters of date palm cultivation. The study concludes that in order to increase date palm production per unit area in the research area, the farmers educational level, both formal as well as agricultural, shall be enhanced with specific focus on adoption of new agricultural practices evolved through latest research.

Key Words: ***Cultivation, Date Palm, Adoption, Educational Level, Technology***

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INTRODUCTION

The history of the industrialized world shows that education has always played an important role in their economic, social, and political development. In the developed nations, development level is positively correlated with education levels. In Pakistan, the case is not different. Since 1947, educational level in Pakistan has constantly increased which has tremendously contributed to the socio-economic development at the national level. In the early days of Pakistan after its inception, the economic conditions of people were poor, literacy rate was low, mortality rate was high, health facilities were name sake, and majority of the people were living in rural areas in kacha houses. Nonetheless, with increase in the literacy rate over time, people's life style as well as livelihood practices underwent tremendous changes. The shift of dwelling habitats from kacha to pacca houses, and from wooden plough driven by animals to modern agricultural technologies like tractor, mechanical harvesters, threshers, etc, are amongst few examples. Moreover, modern sophisticated technology brought the world closer through disseminating scientific information which has been the result of increased educational level. Akbar *et al.* (1990) studied the impact of education on the behavioral change in the farmers. They concluded that there was a significant correlation between education of respondents and adoption of "soil and water testing" and soil reclamation practices by them. Sharif (1990) evaluated the extension field services in Baluchistan (Pakistan), and found a positive relationship between farmers' age, educational status, and size of land holding with the adoption of improved agricultural practices and inputs.

Education and size of land holding were found having no significant relationship with the adoption of improved practices. The major difficulties farmers had in the adoption of improved practices included lack of financial capital, lack of credit facilities, shortage of water, high prices of inputs, and lack of knowledge about the use of new practices (Garforth, 1993). Rao *et al.*, (2001), found that palm trees could be useful from economic uplift of the growers and recommended that their cultivation should be extended to all parts of India and the productivity be enhanced through application of advanced scientific practices. Similarly, Ali (1987) found the productivity constraints of major crops in Islamabad Capital Territory, and observed that majority of the farmers were not adopting modern techniques of production because of their ignorance about these practices, lack of finance to acquire inputs, and so on.

The result of the regression analysis indicated that extension investment had played a significant role in increasing agricultural production only in the high productivity areas (Maula, 1994). The biggest constraint in the adoption of improved technologies is the farmers' standpoint that their use is expensive, and the farmers must be supported by extension services (Njoku *et al.*, 1991). Many governments had made great efforts to provide farmers with relevant information and technology, usually through the public extension service (Maula, 2006). The productivity and performance of agricultural research and extension are of central concern in the process of agricultural development (Khan, 1988). The role of the village extension agents and the T&V extension system as a whole appears peripheral to the main concerns of the farmers (Haq, 1993). Many factors which contribute to the early adoption and fast diffusion of any technology / crop could be overcome through efficient and effective extension services (Hawkins, 1999). Governments of many countries have made efforts to provide farmers with relevant information and technology, usually through the public extension service (Zijp, 1993).

The above literature suggests that farmers' education, both formal as well as technical, has positive impacts on diffusion of new technology to the farmers. The present study was, therefore, taken up with the purpose to evaluate the role of education on diffusion of new technology with particular reference to date palm cultivation in Dera Ismail Khan (DIK) and North Waziristan Agency (NWA). The study was initiated with the specific objectives to evaluate the role of education on the adoption and diffusion of date palm orchards, and to identify the causes of late adoption and slow diffusion of the date palm orchards. The hypothesis to be tested is educational level influences adoption rate and date palm production per unit area in the research area.

MATERIALS AND METHODS

Sample Selection

The universe of this study consists of one agency namely North Waziristan Agency (NWA) from Federally Administered Tribal Areas (FATA) and one district namely Dera Ismail Khan from the settled areas. Both of these economically backward constituencies constitute the Southern parts of the North West Frontier Province (NWFP). These areas represent different farm size and structure, however, are suitable for date palm cultivation. In NWA majority of the farmers are small holders compared to those in D.I. Khan.

Sample Design

To study the application of diffusion of date palm cultivation for socio-economic development of farmers, a field survey on individual farms of different sizes was conducted in the research area. The survey was carried out over a period of three months (June-August 2007). It was thought ideal to administer the questionnaire during these months because these normally represent the slack season where farmers could be expected to spare more time to respond. The survey was carefully designed to elicit data on the comparative performance of agriculture, and on the characteristics of farms of different sizes and of different climates as well as geological and topographic conditions.

Selection of Villages

A list of villages of the selected Tehsils was obtained from the office of Revenue Officer in DIK and Political Tehsildar in NWA. Since all these villages could not be covered in the survey due to lack of time and resources, it was found necessary to extract only four villages at random from each Tehsil. The villages identified for this study were Haider Khel, Qimat Khel, Khali Khel, and Eippi in Tehsil Mir Ali of NWA and Dhakki, Jahara, Mian Wada, and Paniala in Tehsil Paharpur of DIK district.

Selection of Respondents

A list of date palm growing farmers for each village was obtained from the local Agriculture Office. The selection of 25 respondents from each village was made by using random number table. Thus, the total sample size of this study was 200 respondents, as shown in Table I.

Enumeration of Data

A questionnaire was designed in order to collect relevant information from the 200 date palm growers in the area. The questionnaire was designed in such a way as to seek information on farmers' literacy status, operated holdings, ownerships status, and soil classification. The major portion of the questionnaire dealt with information relating to the introduction and diffusion of date palm cultivation both in NWA and DIK. Moreover, questions were

asked about the use of agricultural machinery and new inputs such as chemical fertilizers, plant protection, sources of finance, major problems encountered by farmers, and role of line departments on the adoption and diffusion of date palm orchard.

Table I. ***Distribution of sample respondents of the respondents in Southern parts of NWFP and FATA***

Particulars and Location	T.R	Literate	Illiterate
Haider Khel	25	08	17
Qimat Khel	25	02	23
Khali Khel	25	02	23
Eippi	25	08	17
NWA	100	20	80
Dhakki	25	22	03
Jahara	25	23	02
Mian Wada	25	16	09
Paniala	25	20	05
DIK	100	81	19
Project area	200	101	99

Source: Field Survey
TR = Total Respondents

Problems Envisaged in the Collection of Data

Two major problems were envisaged in the collection of data, one relating to the administration of data and the other is the quality of data obtained. Administering the questionnaire to the sample population of farmers, particularly in Tehsil Mir Ali was time consuming and dangerous. It was because a strong conflict between local people, Taliban and government forces was in operation. To collect field data in such circumstances was at the risk of life because local people suspected the researcher. Moreover, the attitude of people towards NGO people and development workers was also hostile.

Data Analysis

Keeping in view the requirements of the study and nature of data, simple descriptive statistics were used to analyze the data. The sample size was kept alike for each village because the population of each village was almost the same.

RESULTS AND DISCUSSION

Table II represents the frequency and percentage of literate and illiterate farmers in the research area. As clear from the table, 20 percent of the farmers in NWA were literate compared to 81 percent in DIK. This could lead us to the thesis that educated farmers could have faster adoption and diffusion rate of palm orchards than uneducated counterparts. Maula (1994) in his study conducted in NWA concluded that application of new technologies and diffusion rate was higher among the educated farmers than uneducated counterparts. The higher literacy rate in DIK highlighted that the area has superseded NWA in all sectors of the economy including agriculture.

Garforth (1993) reported that education and size of land holdings had no significant relationship with the adoption of improved practices and the difficulties of farmers in the adoption of improved practices were lack of capital, lack of credit facilities, shortage of water, high prices of inputs, and lack of knowledge about the use of new practices. The field data was used to investigate the relationship of education and increase of date palm yield. The data set out in Table 3 clearly shows that education of the farmers and production of date palm were positively correlated. The date farming could not make any remarkable progress, both qualitatively and quantitatively, in the case of lack of education of the farmers in the study area. For instance in NWA, 80 percent of the respondents were illiterate, thence their average yield per tree was 98 kg for improved varieties and 42 kg for local varieties. The situation was worse in case of illiterate farmers whose yield per tree was 90 kg for improved varieties and 38 kg for local varieties. On the other hand in DIK, 81 percent respondents were educated. The average yield per tree was 120 kg for improved varieties and 45 kg for local varieties. The table further illustrates that in case of illiterate farmers in DIK, yield per tree was relatively higher than the illiterate farmers in NWA. This was possibly because of the awareness and knowledge gained by illiterate farmers from their educated counterparts in the area. This depicts that

education has not only direct affects on the production levels of the concerned farmers but also has an indirect influence on the uneducated fellows in the area. The findings are in close connection with those of Akbar *et al.* (1990) who found that education had positive impacts on the behavioral change in the farmers. They found that significant correlation existed between the education of respondents and adoption of new practices of agriculture. Education certainly plays an important role in the adoption and diffusion of new technologies, particularly when it is oriented in such a way as to raise the level of technological awareness of the peasant population. The data set out in Table 4 show that a total of 62.6 percent of farmers in NWA did not learn any useful agricultural practice, which adversely affected the growth rate and expansion of date palm cultivation. According to a study conduced by the United Nations, a high rate of literacy is an advantage because it enhances farmer's awareness of new technologies and their capabilities to make use of them. It is further argued that achievement of high rate of literacy, though an advantage is not enough. It is important that the simple literacy and innumeracy status of peasant farmers is allowed to evolve, equipping them with the technical capability to manage, inter-alia their soil and water resources for date palm orchards cultivation.

The response of the selected growers was positive towards learning new techniques, safe use of pesticides, plant protection measures and new methods of sowing. The data further illustrated that majority of the sample respondents still lacked the advance knowledge and techniques regarding date palm cultivation. However, this gap could be bridged if extension services are activated in the greater interest of the farmers. Moreover, the poor extension services were also posing serious threats to date palm cultivation, particularly in DIK. It can be concluded from the above discussion that extension professional, as criticized by the FAO experts working in different underdeveloped countries, are not doing justice with their jobs.

From the above discussion it has been established that education of the farmers coupled with effective and efficient extension services would play a major role in the early adoption and rapid expansion of date palm cultivation in the Southern parts of NWFP in future.

Table II. ***Education of the respondents in Southern Parts of NWFP and FATA***

Particulars &	**Literate**		**Illiterate**		**Total**	
Location	**Number**	**%**	**Number**	**%**	**Number**	**%**
Haider Khel	8	32.00	17	68.00	25	12.50
Qimat Khel	2	8.00	23	92.00	25	12.50
Khali Khel	2	8.00	23	92.00	25	12.50
Eippi.	8	32.00	17	68.00	25	12.50
NWA.	20	20.00	80	80.00	100	50.00
Dhakki	22	88.00	3	12.00	25	12.50
Jahara.	23	92.00	2	8.00	25	12.50
Mian Wada	16	64.00	9	36.00	25	12.50
Paniala	20	80.00	5	20.00	25	12.50
DIK	81	81.00	19	19.000	100	50.00
Project Area	101	50.00	99	49.50	200	100.00

Table III ***Production of Date Palm of the respondents in Southern Parts of NWFP and FATA***

Particulars & Location	Dhakki	Busra	Zaidi	Gulistan	Haq Nawaz	Ghalini	Asil	Local
	Average yield / tree (kgs)							
Haider Khel	100	0	0	0	0	90	0	42
Qimat Khel	100	0	0	0	0	100	0	43
Khali Khel	90	85	0	0	0	85	0	45
Eippi	100	100	90	0	0	95	0	42
NWA	100	95	90	0	0	95	0	42
Dhakki	120	120	0	100	0	0	0	45
Jahara.	110	110	0	0	0	0	0	0
Mian Wada	120	110	100	110	0	0	120	0
Paniala	120	120	0	120	120	0	0	45
DIK	110	115	0	110	120	0	120	45
Project Area	110	105	90	110	120	95	120	43

Source: Field Survey

Table IV. ***Learning and type of learning of the respondents in Southern Parts of NWFP and FATA***

Particulars / Location	T.R.	Learning				Type of Learning									
		Yes		No		New Techniques		Use of Pesticide		Methods		Protection Measures		Total	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Haider Khel	25	8	24.24	17	51.52	1	03.03	1	03.03	6	18.18	0	-	33	100.00
Qimat Khel	25	2	07.41	23	85.19	0	-	0	-	1	03.70	1	03.70	27	100.00
Khali Khel	25	4	13.79	21	72.41	1	03.45	1	03.45	1	03.45	1	03.45	29	100.00
Eippi	25	9	26.47	16	47.06	0	-	1	02.94	4	11.76	4	11.76	33	100.00
NWA	100	23	18.70	77	62.60	2	01.63	3	02.44	12	09.76	6	04.88	123	100.00
Dhakki	25	1	03.85	24	92.30	0	-	0	-	0	-	1	03.85	26	100.00
Jahara	25	0	-	25	100.00	0	-	0	-	0	-	0	-	25	100.00
Mian Wada	25	2	07.40	23	85.19	0	-	0	-	1	03.70	1	03.70	27	100.00
Paniala	25	5	16.67	20	66.66	0	-	0	-	5	16.67	0	-	30	100.00
DIK	100	8	07.40	92	85.18	0	-	0	-	6	05.55	2	01.90	108	100.00
Project Area	200	31	13.42	169	73.16	2	0.86	3	01.30	18	07.80	8	03.47	231	100.00

Source: Field Survey

CONCLUSION

This research article is based on primary data collected from NWA and DIK in NWFP in 2007. These two places possess almost identical climatic and topographic conditions which are suitable for date palm farming. The date palm growing respondents were selected randomly from these two placed. The universe consisted of 8 villages (four from each agency and district) and total sample consisting of 200 respondents, 25 from each village because the population of these villages was almost the same. The data showed that educated farmers took lead in adoption and diffusion of date palm against un-educated. The majority of the sample respondents i.e. 80 percent were un-educated in NWA. Consequently they lagged behind both in time and magnitude as compared to educated sample respondents in DIK. Thus, it can be concluded that the adoption and diffusion of date palm cultivation is positively co-related with both formal as well as agricultural education.

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