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EFFECT OF SOCIO-ECONOMIC ASPECTS ON THE AWARENESS AND ADOPTION OF RECOMMENDED HORTICULTURAL PRACTICES BY APPLE GROWERS IN BALOCHISTAN, PAKISTAN

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Apple is the fourth important fruit of Pakistan and is ranked 16th in the world for its production. Its per hectare yield in Pakistan is very low due to non-adoption of recommended horticultural practices by apple growers. Adoption decision is generally influenced by a number of factors including socio-economic ones. In order to determine the relationship between socio-economic aspects and the awareness & adoption of recommended horticultural practices. The study was conducted in five apple growing districts of Balochistan. The data were collected from randomly selected 355 apple growers proportionately selected from randomly selected tehsils of the selected districts. Analysis of the data showed that there existed a highly significant relationship of awareness and adoption with socio-economic characteristics like age, education and size of land holding.
Key words: Awareness, adoption, apple, horticultural practices

INTRODUCTION

Apple is the fourth major fruit of Pakistan after citrus, mango and banana and is ranked 16th in the world for its production (GOP, 2003; FAO, 2000). It is one of the favorite fruits of our people for its pleasant flavour, crispy taste, nutritious and aromatic nature and multiple uses. Besides being a rich source of vitamins A, B, and C, it contains formidable amount of proteins, carbohydrates and minerals. Pakistan is lucky enough to be endowed with wide range of agro-climatic conditions which permit the production of both tropical and temperate fruits. The most suitable soil and climatic conditions for apple cultivation prevail in most of the hilly areas of Balochistan and NWFP provinces. During the year 2002-2003, the total area under apple cultivation in Pakistan was 47.7 thousand hectares with an annual production of 315.4 thousand tones, the average yield being 6.6 thousand tones/hac (GOP, 2003). Inspite of some serious pests and disease problem, there is an increasing trend for bringing more area under apple because of better returns.

Apple thrives and fruits best under a relatively cool slow growing season, usually met with higher altitudes. There are many apple varieties grown all over the world. Varieties grown under such conditions in Pakistan are Amri, Kashmiri Amri, Golden Delicious, Red Delicious, Sky Spur, Banki, Kulu etc. Low chilling varieties such as Anna, Summer Gold, Summer Red, Katja and Golden Dorset are giving encouraging results and hence can successfully be grown in lower elevations.

Districts Killa Abdullah, Killa Saifullah, Pishin, Ziarat and Quetta of Balochistan occupies a conspicuous place for growing world best apple varieties. Although the yield is very low as compared to other countries (Ahmad, 1994). The low per hectare yield may mainly be attributed to a number of factors associated with apple production. These may include improper use of irrigation water (Blank and Lenz, 1988), un-even use of fertilizers and other horticultural practices like pruning (Ferree and Forshey, 1988), use of true to type cultivars, rootstock, and resistant varieties against insect/pest and diseases (Warner and Potter, 1988).

Apart from many other factors, the socio-economic and personal traits of the growers such as age, education, size of land holding and type of tenure play a pivotal role in the adoption of innovations (Rashid, 1980). In this context, Hassan *et al.* (2002) found a significant relationship of age, and education of the respondents with the adoption of improved production technologies. In an early study in Lebanon, Betru (1997) argued that personality characteristics of small farmers in relation to their adoption attitude and motivation varied greatly with respect to each of the practices. The present study was undertaken to identify the effect of socio-economic aspects on the awareness and adoption behaviour of the apple growers in Balochistan.

MATERIALS AND METHODS

The universe of the study comprised five apple growing districts (Killa Abdullah, Killa Saifullah, Pishin, Quetta and Ziarat) of Balochistan. One tehsil was randomly selected from each selected district. A comprehensive list of apple growers in the selected tehsils was prepared (list was taken from Executive District Officer (EDO), Agriculture. Out of total 4761 apple growers from the selected tehsils, a sample of 355 farmers was selected through simple random sampling technique by

using the Table developed by Fitzgibbon *et al.* (1987). A proportionate sampling procedure was adopted for the selection of farmer respondents from each tehsil. Therefore, 63 from Killa Abdullah, 57 from Muslim Bagh, 73 from Pishin, 80 from Quetta and 82 farmers from Ziarat tehsil were selected. The data were collected with the help of validated and pre-tested interview schedule through personal interviews by the first author. The data thus collected were analyzed with the help of statistical package for social sciences (SPSS). For data analysis Chi-square test was used.

Computation of Awareness and Adoption Levels

Awareness: First of all, total recommendations were counted in order to ascertain farmers' level of awareness about the horticultural recommendations included in the study. A score of one was given to the recommendation with which the respondent was aware of and zero to those with which he was unaware. An awareness index was then developed by adding the number of recommendations with which the respondent was aware of. The maximum and minimum scores were 57 and 20. Respondents were then divided into three awareness categories i.e. low (20-32), moderate (33-45), and high (46-57) on the basis of awareness score.

Adoption: First of all, total number of recommendations was counted in order to determine farmers' level of adoption about the horticultural recommendations included in the study. There were 66 recommendations in the study. Score of one was allotted to each adopted recommendation and 0 to those which were not adopted. An adoption index was then developed by adding the number of recommendations adopted by the respondents. The maximum and minimum scores obtained were 46 and 14 respectively. Respondents were then divided into three categories i.e. low (14-25), moderate (26-37), and high (38-46) on the basis of adoption score.

Socio-Economic Aspects

Data indicate that most of the respondents (46.70%) belonged to middle aged (> 35-50) category while about one-fourth (28.73 and 25.50%) of the respondents belonged to young (up to 35) and old age (> 50-80) categories respectively. A fair majority (56.60%) of the respondents was illiterate and the remaining 42.40% of the respondents were found to be literate. Out of literate respondents, only 19.74% had primary level of education followed by matric (9.86%), middle (8.17%) and above matric (5.63%). All the respondents were owner cultivators. Most of the respondents (43.11%) were small landholders (up to 5 acres) while only 20.56% of the respondents had above 15 acres of land. Majority (63.94%) of the respondents had an apple orchard of small size (up to 5 acres) and about one-fourth (26.21%) had medium sized orchard i.e. > 5-15 acres.

RESULTS AND DISCUSSION

Relationship of Socio-Economic Aspects with Awareness

The data presented in Tables I-IV indicate that there existed a highly significant positive relationship between awareness and age of the respondents. This means that with the increase in age, there was increase in awareness. There was comparatively higher percentage of higher level of awareness for middle age respondents as compared to young and old ones. However, the above findings negate the results obtained by Ashraf (2001) who reported highly significant negative relationship of age with awareness. There existed highly significant positive relationship between awareness and education. It means that awareness was increased with the increase of education. Furthermore, size of land holding and size of apple orchard, showed non-significant relationship with awareness.

Relationship of Socio-Economic Aspects with Adoption

The data presented in Tables I-IV show that there existed a significant and positive relationship between adoption and socio-economic variables like education and size of apple orchard. Almost similar results were reported by Hayat (1982), Malik (1992) and Hassan *et al.* (2002) particularly with respect to education. Data reflect that illiteracy showed highest percentage (60.1%) at low level of adoption. This percentage gradually increased for adoption by the respondents having up to middle (14.1%) and above middle education (25.5%). This indicates that educated farmers were more adopters of the recommendations as compared to moderately educated and illiterate ones. Furthermore, small orchard owners had low adoption level as indicated by highest percentage (57.3%). Large apple orchard owner showed high percentage (54.3%) at medium level and decreased percentage (14.3%) at higher level of adoption. Data further reveal that there existed non-significant relationship of age and size of landholding with adoption of recommended horticultural practices.

Table I. Relationship between age of the respondents and awareness and adoption

Age	Awareness			Adoption		
	Low	Moderate	High	Low	Moderate	High
	Percentages			Percentages		
Young	55.0	39.2	5.8	55.9	35.3	8.8
Middle	44.0	41.0	15.0	48.8	34.3	16.9
Old	55.2	36.8	8.0	62.1	27.6	10.3
	X^2 cal. = 15.51**			X^2 cal. = 6.73^{NS}		

Table II. Relationship between education of the respondents and awareness and adoption

Education	Awareness			Adoption		
	Low	Moderate	High	Low	Moderate	High
	Percentages			Percentages		
Illiterate	58.3	41.3	5.5	60.1	29.9	10.0
Up to middle	52.5	30.3	17.2	47.5	40.4	14.1
Above middle	32.8	49.0	18.2	43.6	30.9	25.5
	X^2 cal. = 15.49**			X^2 cal. = 10.47*		

Table III. Relationship between size of land holding of the respondents and awareness and adoption

Size of land holding	Awareness			Adoption		
	Low	Moderate	High	Low	Moderate	High
	Percentages			Percentages		
Small	53.9	39.6	6.9	59.7	28.6	11.7
Medium	46.5	40.3	13.2	51.9	36.5	11.6
Large	47.2	37.5	15.3	45.8	36.1	18.1
	X^2 cal. = 5.68^{NS}			X^2 cal. = 5.32^{NS}		

Table IV. Relationship between size of apple orchard of the respondents and awareness and adoption

Size of apple orchard	Awareness			Adoption		
	Low	Moderate	High	Low	Moderate	High
	Percentages			Percentages		
Small	52.4	39.6	8.0	57.3	31.3	11.4
Medium	48.4	36.6	15.0	54.8	29.0	16.2
Large	37.1	45.7	17.2	31.4	54.3	14.3
	X^2 cal. = 5.65^{NS}			X^2 cal. = 10.38*		

CONCLUSIONS

It can be concluded that education is the most important factor related to awareness and adoption of the horticultural recommendations by apple growers. The farmers who had relatively better education, were more aware of recommended horticultural practices and their adoption level was also high. Age was also found to have a highly significant positive relationship with awareness but it had no relation with adoption. This means that with the increase in age there was also increase in awareness. Size of land holding and size of apple orchard did not have any significant relationship with the awareness, however, orchard size showed significant positive relationship with adoption. The farmers who possess large farms had high adoption rate as compared to those who had small orchards.

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