

RESEARCH ARTICLE :

Correlation analysis between profile characteristics of maize farmers and their extent of adoption of recommended package of practice of maize in Mahmud I Raqi district of Kapisa a province of Afghanistan

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SUMMARY : Maize (*Zea mays* L.) has become a staple food crop in many parts of the world, with total production surpassing that of wheat or rice. However, all this maize is consumed as food, animal starch and ethanol produce etc. As food and feed it is consumed directly as green cob, roasted cob or popped grain. Its grain can be used for human consumption in various ways such as corn meal, fried grain and flour. Maize grain has high nutritive value containing 66.2 per cent starch, 11.1 per cent protein, 7.12 per cent oil and 1.5 per cent minerals. In addition, it contains 90 mg carotene 1.8 mg niacin 0.8 mg thiamine and 0.1 mg riboflavin per 100 g grains. An *ex-post facto* research design was used in present investigation. The study was confined to Mahmud I Raqi district of Kapisa one of the province of Afghanistan. From this district four villages were randomly selected. From each village 30 samples were randomly drawn. In this way, the sample size for the study comprised of 120 respondents. Twelve independent and one dependent variable were taken for the study. The data were collected by personal interview method through structured interview schedule and analyzed by correlation co-efficient.

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BACKGROUND AND OBJECTIVES

Maize is one of the most efficient crops with high biological as well as grain yield in a relatively short period of time due to its unique photosynthetic mechanism as C₄ plant. The climatic conditions of the most countries of

world are favourable for its cultivation round the year. In the world it is cultivated on 1777.46 million hectares with a production of 974.87 million tons and the productivity of 5490 kg per hectare. China occupies the first place regard to acreage with 37.85 million hectares

followed by USA (32.64 million hectares), Brazil (15.8 million hectares), and European Union (9.27 million hectares). USA is the leading country in the world with 346.82 million tons with regard to production followed by China (225 million tons) and India 22.50 million tons (USDA, 2015). In Afghanistan 70 per cent of population lives in rural areas and over 65 per cent of the total economically active population is being dependent on agriculture and related activities for livelihood (Sadruddin *et al.*, 2014). Overall performance of agriculture in Afghanistan is very much dependent on cereal production, which accounted for over three-fourth (77.00%) of the agricultural GDP at 2010-11 market prices. Corresponding shares of horticulture and livestock sub-sectors in agriculture GDP was 9 per cent and 14 per cent, respectively (Agriculture and prospects Report, 2012). Mahmud I Raqi district of Kapisa province is one of the major maize growing areas of Afghanistan. Farmers are still using traditional low yielding varieties and not adopting the latest production recommendations leading to low yields of maize.

RESOURCES AND METHODS

For the present investigation, an *ex-post-facto* research design was used. Mahmud I Raqi district of Kapisa was purposively selected as maize was being extensively cultivated in the district. Four villages from the district were randomly selected. From each of the selected villages, 30 respondents were selected by following simple random sampling procedure thus, making a total of 120 respondents who were cultivating maize

crop. Twelve independent *viz.*, age, education, farming experience, farm size, mass media exposure, extension contact, social participation, scientific orientation, economic orientation, innovativeness, achievement motivation, deferred gratification and one dependent variable *viz.*, extent of adoption were taken for the study. The data were collected by personal interview method through structured interview schedule and analyzed by correlation co-efficient.

OBSERVATIONS AND ANALYSIS

The results obtained from the present study as well as discussions have been summarized under following heads:

Relationship between the selected independent variables and their extent of adoption of recommended package of practices by the maize farmers :

In order to study the nature of relationship between the selected independent variables and the extent of adoption of the recommended package of practices by the maize farmers, correlation co-efficients (r) were computed and the values are presented in Table 1. This relationship between the scores of selected independent variables and the extent of adoption of the recommended package of practices by the maize farmers were tested by Null hypothesis and empirical hypothesis. Null hypothesis there will be no significant relationship between the selected independent variables *viz.*, age, education, farm experience, farm size, mass media

Table 1 : Correlation co-efficients between the selected profile characteristics and the extent of adoption of the maize farmers (n=120)

Sr. No.	Variable No.	Independent variables	Correlation co-efficient ('r' values)
1.	X ₁	Age	-0.205*
2.	X ₂	Education	0.558**
3.	X ₃	Farming experience	-0.224*
4.	X ₄	Farm size	0.115NS
5.	X ₅	Mass media exposure	0.583**
6.	X ₆	Extension contact	0.444**
7.	X ₇	Social participation	0.235**
8.	X ₈	Scientific orientation	0.386**
9.	X ₉	Economic orientation	0.404**
10.	X ₁₀	Innovativeness	0.393**
11.	X ₁₁	Achievement motivation	0.276**
12.	X ₁₂	Deferred gratification	0.400**

* and ** indicate significance of values at P=0.05 and 0.01, respectively level of probability

NS : Non-significant

exposure, extension contact, social participation, scientific orientation, economic orientation, innovativeness, achievement orientation, deferred gratification and the extent of adoption of the recommended package of practices by the maize farmers. Empirical hypothesis there will be significant relationship between the selected independent variables *viz.*, age, education, farm experience, farm size, mass media exposure, extension contact, social participation, scientific orientation, economic orientation, innovativeness, achievement orientation, deferred gratification and the extent of adoption of the recommended package of practices by the maize farmers.

Adoption vs Age :

It could be observed from the Table 1 that the computed co-efficient of correlation value ($r' = -0.205^*$) was found to be negatively and significantly related with the extent of adoption of the recommended package of practices by the respondents. Hence, the Null hypothesis was rejected and empirical hypothesis was accepted. It could be inferred that there was negative and significant relationship between age and the extent of adoption of recommended maize cultivation practices. This might be due to the reason that most of the farmers belonged to young age category and old age farmers might not have adopted latest practices. Hence, there is a every need to involve the old farmers in the adoption of latest production recommendations by conducting training programmes, meetings by the agencies of agricultural extension.

Adoption vs Education :

From the Table 1 it is evident that the computed co-efficient of correlation value ($r' = 0.558^{**}$) was positively and significantly related with the extent of adoption of the recommended package of practices. Hence, the Null hypothesis was rejected and empirical hypothesis was accepted. Therefore, it could be confirmed that there was positive and significant relationship between education and the extent of adoption of recommended maize package of practices. This might be due to the reason that if education of farmers is high, their mental horizons are broaden and they will acquire more knowledge about various cultivation aspects and try to practice newly acquired knowledge and information in their cultivation. Because of education famers will be able to analyze the suitable recommended practices to

their local situation and farm, which might have resulted in increased level of adoption. This observation was substantiated by the conclusions of Latha (2002)

Adoption vs Farming experience :

Table 1 pointed out that the computed co-efficient of correlation value ($r' = -0.224^*$) was negatively and significantly related with the extent of adoption of the recommended package of practices. Hence, the Null hypothesis was rejected and empirical hypothesis was accepted. Therefore, it could be inferred that there was a negatively significant relationship between farming experience of the maize growers and the extent of adoption of the recommended cultivation practices. It could be inferred that higher the farming experience of the maize farmers, the poorer would be the extent of adoption. The possible reason might be that based on the farming experience in cultivation of maize, the farmers will make changes in package of practices. It was observed that most of the farmers were not adopting the latest production recommendations and were doing farming traditionally. The strength of the extension personnel was poor and the extension agencies were not having adequate facilities even to train their staff also. Even though farmers were cultivating maize for a longer time the other factors related to maize cultivation in the society were deteriorating along with the time. Proper planning of the programmes for the upliftment of the farmers and policies related to agricultural marketing was not done. Hence, the adoption of innovative technologies was observed low in case of more experienced farmers.

Adoption vs Farm size :

From the Table 1 it is evident that the computed co-efficient of correlation value ($r' = 0.115NS$) was found positively and non-significantly related with the extent of adoption of the recommended package of practices. Hence, the Null hypothesis was accepted and empirical hypothesis was rejected. Therefore, it could be confirmed that there was positive and non-significant relationship between farm size and the extent of adoption of recommended maize package of practices. Almost all the maize farmers irrespective of the farm size were using the similar package of practices and their land holding were mostly similar except in case of few farmers, sometimes there was no much gap between

the incomes of the different categories of the farmers with respect to their farm size. Hence this trend might have been noticed and there was no significant relationship between their adoption and farm size.

Adoption vs Mass media exposure :

Table 1 pointed out that the computed co-efficient of correlation value ($r=0.583^{**}$) was found positively and significantly related with the extent of adoption of recommended package of practices of maize. As such, the Null hypothesis was rejected and empirical hypothesis was accepted. Therefore, it could be reported that there was positive and significant relationship between mass media exposure and the extent of adoption of the recommended package of practices. It is natural that increased mass media exposure broadens the understanding, awareness and adoption of recommended practices and this in turn leads to better adoption of recommended practices by the maize farmers. This result is substantiated by the findings of Kumar (2002).

Adoption vs Extension contact :

Table 1 indicated that the computed co-efficient of correlation value ($r=0.444^{**}$) was found positively and significantly related with the extent of adoption of the respondents about the recommended package of practices. Hence, the Null hypothesis was rejected and empirical hypothesis was accepted. Therefore, it could be confirmed that there was a positive and significant relationship between extension contact and the extent of adoption of recommended maize package practices. This might be due to the fact that the farmers with more extension contact acquire more knowledge about the advanced developments and form favourable attitude, which in turn lead to the adoption of technologies. Some farmers were making best efforts to meet the extension personnel at different levels including their village, such farmers who had better localite channels were able to adopt suitable recommendations and hence such trend was noticed. This conclusion is supported by the findings of Kumar (2004)

Adoption vs Social participation :

Table 1 revealed that the computed co-efficient of correlation value ($r=0.235^{**}$) was found positively and significantly related with extent of adoption of the respondents about the recommended package of

practices. Hence, the Null hypothesis was rejected and empirical hypothesis was accepted. Therefore, it could be confirmed that there was a positive and significant relationship between social participation and the extent of adoption of recommended package of practices of maize. The possible reason might be that increased social participation provides more avenues of getting exposed to different sources and situations related to agriculture, which increases their knowledge, and urge to practice them in to field. The localite channels sometimes were playing important role in the adoption of technologies, farmer to farmer transfer of technology was more prominent. Hence, this trend was noticed. This conclusion is supported by the findings of Reddy (1997).

Adoption vs Scientific orientation :

From a pigeon hole observation of Table 1 it is evident that the computed co-efficient of correlation value ($r=0.386^{**}$) was found positively and significantly related with the extent of adoption of the respondents about the recommended package of practices. Consequently, the Null hypothesis was rejected and empirical hypothesis was accepted. Therefore, it could be confirmed that there was a positive and significant relationship between scientific orientation and the extent of adoption of recommended package of practices of maize. Farmers having more scientific orientation will be motivated to know more scientific information about improved agricultural technologies. Due to this, they might develop favorable attitude towards the technologies, which in turn led them to adopt new agricultural technologies. Hence the above trend was noticed. Similar results were observed by Kumar (2002).

Adoption vs Economic orientation :

From the figures of Table 1 it is evident that the computed co-efficient of correlation value ($r=0.404^{**}$) was found positively and significantly related with the extent of adoption of the respondents about the recommended package of practices. Therefore, the Null hypothesis was rejected and empirical hypothesis was accepted. Therefore, it could be confirmed that there was a positive and significant relationship between economic orientation and the extent of adoption of recommended maize package of practices. Adoption of package of practices of maize improves the quantity and quality of produce, resulting in high market price and net

returns. The farmers with high economic orientation will work towards higher yields and economic returns. During this process they will acquire more knowledge and skills from different sources of information and adopt the same in their fields. Hence, the above trend was observed. The above finding is in conformity with the findings of Obaiah (2004).

Adoption vs Innovativeness :

A cursory glance of Table 1 shows that the computed co-efficient of correlation value ($r=0.393^{**}$) was found to be positively and significantly related with the extent of adoption of the respondents about the recommended package of practices. Consequently, the Null hypothesis was rejected and empirical hypothesis was accepted. Therefore, it could be confirmed that there was a positive and significant relationship between the antecedent and consequent variables. Innovativeness is associated with the individual's earliness in the use of new practice in the social system. Therefore, a person, who is more innovative, acquires more knowledge from various sources and tries to adopt the technologies without any hesitation and this might be the reason for the above relationship.

Adoption vs Achievement motivation :

Results in Table 1 indicated that the computed coefficient of correlation value ($r=0.276^{**}$) was found to be positively and significantly related with the extent of adoption of the respondents about the recommended package of practices. Consequently, the Null hypothesis was rejected and empirical hypothesis was accepted. Therefore, it could be confirmed that there was a positive and significant relationship between achievement motivation and the extent of adoption of recommended package of practices of maize. Individual with high achievement motivation would be determined to reach his goal with concrete efforts in spite of several obstacles. In this process, he knows the importance of adoption of recommended practices or he may search for the best alternative and this leads to higher production. It is obvious that a farmer with achievement motivation will definitely conceive new ideas and skills better than the others and this higher order conception might have influenced to have better extent of adoption. This conclusion derived support from the findings of Kumar (2002).

Adoption vs Deferred gratification :

Table 1 shows that the computed coefficient of correlation value ($r=0.400^{**}$) was found to be positively and significantly related with the extent of adoption of the respondents about the recommended package of practices. Consequently, the Null hypothesis was rejected and empirical hypothesis was accepted. Therefore, it could be confirmed that there was a positive and significant relationship between the deferred gratification and the extent of adoption of recommended maize package of practices. Some of the farmers usually get small quantity of produce and sell it immediately at the village level or nearby market, but the other farmers had to wait to sell the produce for getting better price or to sell it in the market. Hence, this trend was noticed and differed gratification had positive and significant relation with extent of adoption.

Conclusion :

It can be concluded that correlation analysis revealed the selected independent variables *viz.*, farming experience, mass media exposure, extension contact, social participation, scientific orientation, economic orientation, innovativeness, achievement motivation and deferred gratification had positively significant relationship, whereas age and education were having negative and significant relationship, and farm size had non-significant relationship with the extent of adoption of recommended package of practices of maize. More effort should be towards improvement of those independent variables which have positively and significantly relationship with the extent of adoption of package of practices of maize.

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