

Research Article



Impact of Age and Education on Climate Change Awareness in a Farming Community of the Faisalabad District

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Abstract | The changing climate is an important issue in the modern age and therefore is of much concern to all countries independent of their size or stage of development. In Asia, particularly, the agricultural production might decrease by an alarming rate up to 5-30% to 2050. The main reason for this is increasing the earth's temperature. The decrease in crop yield will cause another associated issue of food insecurity in the continent and emerge severe problem for a human to survive. Climatic change is definitely disturbing the farming approaches through an increase in disease spread, and careless usage of natural resources. Due to these effects, pastoral families are at high risk, hence there is a need to make farmers aware of the reasons and causes of climate change so that they may contribute to their side in actively advocating the cause. The present study was survey-based research and carried out in the Faisalabad district of Punjab, Pakistan. The data was collected using a multistage sampling method with the help of well-structured interview schedule. At first, on the basis of simple random sampling Faisalabad saddar tehsil was selected. Six villages were selected from two union councils using simple random sampling. The villages were Dhol Mahjra, Lilan, Sar Shameer, Javadi, Mulanpur, and Suman. In the last stage, 30 respondents from each village were selected randomly. The total sample thus comprised of 180 farmers. A significant association was observed between the level of education and awareness of the farmers, which shows that educated farmers had adequate knowledge of climate change.

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1. Introduction

The term climate change is commonly used to symbolize the change in temperature in usual (natural) or unusual (man-made) way (Pradhan, 2002). Considerable changes in climatic patterns like storms, raining schemes, and prolonged scarcity has been observed all over the world. Hence the result of such climatic variations is most un-favourable for humans and plants on earth. During the last few

years, the temperature of the earth has increased to about 0.75 °C. Hence there has been a vibrant change in weather during the last five decades due to which rural communities will face severe changes in weather patterns in near future. Out of the twenty years of last century, 14 were extremely hot and the further increase in two to four degrees Celsius (on an average) is expected in the 21st century. Hence it will have a very severe effect on agricultural patterns on the land. It is now much crucial for developing countries,

which will have to face natural calamities and disasters due to which island countries might be destroyed by such processes (IPCC, 2007). Changes in climatic patterns have high effects on land's resources and will persist for longer duration due to human activities, deteriorating the environment consequently causes degradation in environmental structure primarily due to release of greenhouse gases (Oxfam, 2009).

Presently climate change is extremely high threat on earth. Due to this change different disastrous effects arise including storms, famines, affected marine life and limited agricultural production (Adebayo and Oruonye, 2013). Even minute variations in weather cause a serious threat of the prevalence of diseases, especially on crops in countries like Pakistan. The countries, which have low agricultural production, might be sensitive to climatic changes due to heat stress and changing cropping pattern causing more decrease in agriculture development. The changing climate is a most important issue of the modern age and therefore is of much concern to all the countries, regardless of their size and stage of development. In Asia, particularly, the agricultural production might decrease by an alarming figure of 5-30% till 2050. The main reason for this is just increasing global temperature. The decrease in crop productivity will cause another associated issue of food insecurity in the continent and become a severe problem for a human to survive (Govt. of India, 2011). Climate change seriously influences agricultural practices and farming systems (Raghuvanshi *et al.*, 2017) because agriculture sector is most vulnerable to climate change and is rich source of greenhouse gases (Arbuckle *et al.*, 2015).

It is fact that increasing adverse conditions for agricultural crops is causing hurdles in agricultural productivity and affecting the plant health at different phases of growth resulting in a reduced crop yield. Increase in temperature has not only affected developing countries, but also the entire world as a whole. The agriculture sector along with aquatic life is most affected due to the increase in temperature. Hence agriculture sector is lacking long-term developmental goals because of inadequate strategies (Boyd *et al.*, 2009). Effect of climate change on farming had a worse influence on agricultural production followed by an increase in manufacturing costs and decreased food production, consequently causing malnutrition (Adebayo *et al.*, 2012). Such types of factors, which are responsible for changing

climatic patterns, affect the human food requirements (Kemausuor *et al.*, 2011). It can be observed from global warming and substantial changes in climate have a direct influence on livestock as well as crop production and input application. These all factors are contributing to decreased farmers' livelihoods (Joshi and Tadiparti, 2012).

In this scenario, it is necessary to enforce the adoption of good practices to protect the environment from negative consequences of climate change. Besides this adequate training session related to climate impacts and field trials must be accompanied during adoption of innovations. But these practices must be introduced after thorough understanding, observation, surveying and planning. It is more important to sort out the negative impacts of innovations, and adequate managerial steps should be taken to avoid the use of such practices and techniques, which are unfriendly for the climate and causing distortion in climatic patterns (Hiremath and Shiyani, 2012). Change in the climate has become a global issue because it has not only interrupted human activities but it has also affected the aquatic life as well. It disturbs the dietary needs of living things on earth that's why the effects of climate change on agriculture are much under discussion globally (Baede, 2018). Fischer *et al.* (2005) investigated the sociological and economic impact of continuously changing climatic patterns on agriculture and concluded that there is significant association between socio-economic impact and continuously changing climatic patterns on agriculture. They further suggested that adoption of latest agricultural practices could reduce the impact of climatic changes on agriculture. The climate change adaptation effects depend on the magnitude of awareness among community members (Ado, *et al.*, 2018).

Africa is one of the countries highly sensitive to climate changes, and agriculture plays a significant role in its sustainable development (Challinor *et al.*, 2007). Climatic changes have posted negative impact on agricultural development by decreasing agriculture production and causing natural disasters and climates. Consequently, agriculturists need to observe all these changes and devise policies to minimize their impact on agriculture and crop production. In this situation, livestock experts are much conscious about the concerns of climate change on animals (Mandleni, 2011). Current and future farming practices are significantly dependent and associated with climatic

changes. Growing population and impacts of social, economic and environmental changes in agricultural productivity cannot be reduced unless to focus on sustainable development in agriculture sector on a priority basis (Fischer *et al.*, 2002). Climatic changes are significantly disrupt farming approaches by increasing insects/pests and diseases, depleting natural resources and causing disasters, and decreasing crop yields. Due to these consequences rural families are facing higher risks of natural disasters and calamities. Considering this scenario, present study was designed to investigate the impact of age and education on climate change awareness in a farming community. The study will help public and private sector institutions working on climate change and its impacts. Moreover, the findings of this research will help to improve awareness regarding climate change and its impacts among farming communities.

2. Materials and Methods

The study was carried out in the Faisalabad district in Punjab, Pakistan. The data was collected using a multistage sampling method. All the farmers living in District Faisalabad were considered as the population of the study. At first stage one tehsil out of six tehsils including Chak Jhumra, Faisalabad City, Faisalabad Sadar, Jaranwala, Sammundri and Tandlian Wala was chosen on random selection basis, which was tehsil Faisalabad Saddar. Then at second stage 2 union councils were selected from tehsil Faisalabad Saddar. At third stage 3 villages were randomly selected from each union council. Total 6 villages; Dholmahjra, Lilan, Sar Shameer, Javadi, Mulanpur, and Suman, were selected randomly. In the last stage 30 respondents from each selected village were selected randomly. The total sample comprised of 180 farmers. A well-structured interview schedule was used as data collection tool for this research. Face to face interview were conducted to collect required data. The interview schedule consisted of different sections related to the topic under study. The first and most important section was related to socio-economic characteristics of the respondents (age, marital status, education, occupation, dependent family members, monthly income etc.) while the next section was related to respondents' climate change awareness and different causes of climate change were enlisted and farmers were asked to rate each according to their awareness. Data collected were analysed by using Statistical Package for Social Sciences (SPSS).

Descriptive statistics were used and chi-square was used to find out association of education and age with climate change awareness in farming community.

3. Results and Discussion

3.1 Demographic attributes

Age is one of most significant demographic factors, which has great influence on behavioral changes not only among humans but also in all living creatures on earth (Talebi and Tajeddin, 2011). Therefore, among demographics, the farmers were firstly asked about their age. The analyzed data showed that little more than one fourth (25.6%) of the farmers were lying in the age category of 21 to 30 years, which shows that the farmers were quite mature and fresh into the agriculture sector. In addition to this, one fourth (25.0%) of the respondents were lying in the age category of 31 to 40 years while 18.3% of the farmers were between the age category 41 to 50 years. Overall the average age of the farmers interviewed was around 41 years.

The marital status of the farmers plays a very effective role in their awareness level regarding climate change. An overwhelming majority of farmers (83.3%) were married while 16.7% of respondents were unmarried. Size of the family of the respondents was categorized into four classes. More than half (58.8%) of respondents had a family comprised of 4-8 members while 23.4% of the farmers had family comprising of 9-11 members. Nearly half (48.3%) of the respondents had a nuclear type of family system while 44.4% of respondents had a joint system. Few (5.0%) of the respondents had an extended type of family system and 2.2% of respondents were living in the one-man family system.

An education is also one of most significant factors in sociological processes and also has a rich contribution in realms structure on the basis of prominent associations between education and economic growth (Khan, 2010). Education is a very important demographic variable. Therefore, farmers were asked about their educational level. In the present study, 28.3% of respondents were matriculated followed by 20.0% graduate and 18.9% respondents had not completed even 10 years of schooling. Few (6.1%) were also illiterate in this era of modernization.

3.2 Awareness level regarding climate change

Awareness about climate change is very essential

especially for those who are affected by it. Individuals must know about the basic causes of climate change so that they can contribute to this noble cause to raise awareness regarding climate change and its consequences (Kropp and Scholze, 2009). Table 1 depicts that the majority (60%) of the farmers regarded the change in temperature, rainfall and wind pattern as a major concern of climate change while 21.7% of the farmers regarded an increase in insects/pests, diseases and weeds due to climate change. Similarly, 11.7% of farmers were of the view that climate change is a major factor causing a decrease in crop yield/ production. While 4.4% of farmers think climate change is causing a shortage of available water for irrigation and 2.2% of farmers believed that climate change is also causing health issues in human as well as in animals.

Table 1: Climate change awareness among famers.

Indicators	Fre- quency	Per- centage
Decrease in crop yield/ production	21	11.7
Increase in insects/pests, diseases and weeds	39	21.7
Change in temperature, rainfall and wind pattern	108	60.0
Causes shortage of available water for irrigation	8	4.4
Causes health issues in human and animals	4	2.2
Total	180	100.0
Mean	4.14	
St. Deviation	1.36	

3.3 Bi-variate analysis

The chi-square analysis was applied between the education and awareness of farmers regarding climate change. The chi-square value was recorded to be 30.225 and the p-value was recorded 0.00 (Table 2), which showed a significant association between the education of farmers and their awareness level regarding climate change. Hence enhancing the educational level of farmers can result in an increase in their awareness level regarding climate change. The gamma value (Gamma = .382) shows that there exists a positive association between the variables under study (i.e. with the education of farmers). So, the hypothesis “higher education of farmers has a significant impact on farmers’ awareness to climate change” is accepted at the 5% level of significance.

The chi-square analysis was applied between the age and awareness of farmers regarding climate change.

The chi-square value was obtained to be 17.425 and the p-value was recorded 0.0157 (Table 3), which showed an insignificant association between age of farmers and their awareness regarding climate change. Hence enhancing the awareness level regarding climate change is not associated with the age of respondents. The gamma value (Gamma = .135) shows that there is no positive association between the variables under study (i.e. with age of farmers). So, the hypothesis “higher education of farmers has a significant impact and awareness of farmers towards climate change” is accepted at 5% level of significance.

Table 2: Association between education and level of awareness.

Education	Level of awareness			Total
	Low	Medium	High	
Illiterate	1	4	6	11
	7.10%	5.80%	6.20%	6.10%
Under matric	5	14	15	34
	35.70%	20.30%	15.50%	18.90%
Matriculate	6	30	15	51
	42.90%	43.50%	15.50%	28.30%
F.A	0	10	22	32
	.0%	14.50%	22.70%	17.80%
Graduation	2	9	25	36
	14.30%	13.00%	25.80%	20.00%
Post-graduation	0	2	14	16
	.0%	2.90%	14.40%	8.90%
Total	14	69	97	180
	100.0%	100.0%	100.0%	100.0%

Chi Square = 30.225; df = 10; P-Value = .000; Gamma = 0.382

Table 3: Association between age and level of awareness.

Age	Level of Awareness			Total
	Low	Medium	High	
20-30	6	14	26	46
	42.90%	20.30%	26.80%	25.60%
31-40	3	24	18	45
	21.40%	34.80%	18.60%	25.00%
41-51	5	8	20	33
	35.70%	11.60%	20.60%	18.30%
51-60	0	15	16	31
	0.0%	21.70%	16.50%	17.20%
Above 60	0	8	17	25
	0.0%	11.60%	17.50%	13.90%
Total	14	69	97	180
	100.0%	100.0%	100.0%	100.0%

Chi Square = 17.452; df = 8; P-Value = 0.157; Gamma = .135

Conclusions

Keeping in view the results of the study different conclusions regarding demographic characteristics and farmers climate changes awareness was made. There is a significant association between level of awareness possessed by the farmers and their educational level, which shows that highly educated farmers had enough knowledge regarding climate change. The insignificant association between age and awareness of farmers regarding climate change shows that all the farmers must have awareness regarding climate change. There is a need to make farmers aware of climate change regardless of age. On the basis of the results and conclusion of the study, it is suggested that in order to minimize effects of climate change on agriculture, farmers must be fully aware of climate changes and future threats to productivity of agriculture sector. Rural communities should be provided educational facilities so that they may be capable to understand forthcoming challenges in agriculture due to climate change. Moreover, public and private sector institutions should launch massive campaigns to raise awareness of climate change and its consequences among communities. In addition to this, there is also a need to mobilize the civil society to improve the farmers' awareness of climate change.

Author's Contribution

Ayesha Chaudhary perceived the research idea, supervised the research and assisted in the construction of a data collection tool. Fouzia Mumtaz conducted the research and collected the data and coded the data for analysis. Muhammad Yaseen helped in the preparation of the manuscript and revised the manuscript according to reviewers' guidelines and coordinated the correspondence related to this research. Muhammad Younis Afzal conducted an analysis of data and prepared manuscript and assisted in the collection of data.

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