

# Secondary School Students' Level of Awareness about the Causes of Environmental Change in the Khyber Pakhtunkhwa Province of Pakistan

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## ABSTRACT

This study intends to assess students' attitudes at secondary-level schools about the causes of environmental changes and related issues across Khyber Pakhtunkhwa province, Pakistan. All human beings, especially students at the school level, need to understand the fragility of our environment and the importance of its protection to create a bright future. In the study, the researcher used a quantitative approach by surveying 10th class (N=169782) students' of 2227 Public Secondary schools. A multi-stage sampling technique was applied to determine the sample size through four (4) stages, namely; a random selection of 7 districts from seven divisions of KP, referring to the number of male/female schools in the selected districts, a random selection of 10 schools in each randomly selected district and identifying one section of science and one section of humanities of 10th class as the participants for the purpose. Researchers have used a self-developed data collection tool (self-reported test) made from the science syllabus of the 10th class. In the instrument, the study objective was reflected from item1 to item14 only. The instrument was made valid and reliable through expert opinions and the pilot testing method. Overall, the study results showed that all the students had satisfactory awareness of the causes of environmental change. It also revealed significant differences regarding demographic variables such as students from the science and humanities section, gender, and area. Results were discussed, and recommendations were given regarding the environmental changes so that all students across the Khyber Pakhtunkhwa province and the country could cope with the changes.

**Keywords:** Environment, Environmental conservation, Environmental awareness, Secondary school level, Multi-stage sampling, Pakistan.

## Introduction

Human activities cause complex effects on environment dilapidation, including industrial development, rapid increase in population, change from rural to the urban mode of life, an increase of trade around the world, and using available resources on a high scale and low-income level people. These activities impact change in climate, the greenhouse effect, reduction in the ozone layer, destruction of forests, change of

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fertile land into desert, decline of biological diversity, and poor health conditions. Furthermore, human beings are badly affected by the harmful level of noise, dangerous waste products, and pollution created by radioactivity. To solve environmental issues and to protect our environment future collective and individual participation is needed on local and international levels. The Behavior of students can be positively changed through teachers and education in an extroversion way (Ullah et al., 2019) and it can promote eco-friendly approaches, habits, and attitudes (Chen et al., 2019). The word 'environment' is rooted in the Latin language, which means to encircle or to surround (Chandra & Sharma, 2010). It is a combination of living and nonliving components that have interrelationships (Coker et al., 2008). According to the definition of science, the environment consists of biotic and abiotic surroundings of humans, or populaces, and all features like weather conditions and composition of the soil, which can influence his life, growth, progress, and development. The definition of awareness is the perception and feelings of persons regarding their environment and how they comprehend it, recognize it, and respond to it (Cruz, 2004). If our students are educated, they will have good feelings and thoughts about the environment and effectively counter the causes that will change the environment. Learning empowers the students to a certain extent. Learning also contributes to environmental preservation through awareness and skillfulness gained from education. The role of teachers regarding the awareness of the environment is vital to educating their students at the school level about environmental issues. As stated, education is directly linked to the development of nations and the entire world (Kamran et al., 2015); therefore, education of any level will give rise to students' awareness of any phenomenon.

Therefore, in this study, the authors investigated the level of awareness of the students in order to address secondary school students' environmental awareness regarding the causes of change in the environment in the Khyber Pakhtunkhwa province of Pakistan.

## **Literature Review**

A well-defined definition of awareness is how people apprehend and understand their environments, the manner of getting familiarity, observing it, and conveying apprehension (Zelezny et al., 2000). The meaning of environmental awareness is being worried about environmental concerns and thoughtfulness about environmental problems (Athman & Monroe, 2001). Merely responsiveness and understanding of fundamentals and concepts related to environs and concerns of different environmental problems, e.g. contamination, population explosion, ruthless cutting of trees, changes in biodiversity, energy-related problems, etc. (Toili, 2007). It is stated that education is the main gateway to informing the students about the environment because education can guide them on how to care about the environment and how to stop the changes that are occurring in the environment due to the pollution in the surrounding (Hamalosmanoglua, 2012). The awareness comes due to education, and education, in turn, makes the students informed and knowledgeable about sustainable development (Kamran et al., 2015; Mughal et al., 2011). The researchers have stated that the students' attitudes can be predicted due to the education (Kamran et al., 2015) that they have about the awareness regarding the environment. Besides, environmentalists and other activists have repeatedly stated the education system should include courses on environmental safety and sustainable development (Shobeiri, 2005; Aminrad *et al.*, 2011). Shobeiri (2005) stated that it is very important to protect our environment and should promote awareness about the environment in the mass, especially among students for the reason that they will be effective protectors, organizers, rule makers, and educators of the environment and environmental issues in the future.

In a research study, it was revealed that secondary-level students take an interest in the complex environmental changes that take place in their surroundings. This leads to the excitement of the students. Further, the secondary level students are knowledgeable enough to understand the losses that are taking place in the environment and can possibly make solutions to these environmental damages (Khalidi, 2018).

Research studies done in the Pakistani context have shown that attitude of Pakistani students toward environment is moderately positive and they are willing to solve environmental problems. Result of the

study showed that items related to protection of environment were highly scored by students and they were of the opinion that they should take part for the conservation of their environment. It is suggested by them that student's daily life participation for environmental protection activities should be appreciated because in this way they will become more responsive in future and it will promote their positive attitude. To solve the issues of environment activity-based learning can be more effective and fruitful (Toili, 2007; Yousuf & Bhutta, 2012).

The researchers also revealed that students' awareness and attitudes are really influenced by external factors such as social media and other factors like reading newspapers, magazines and other materialized things such as different advertisements on the internet (Özden, 2008; Yousuf & Bhutta, 2012).

Past studies revealed that students' attitudes and awareness about the environment have a significant influence on their behavior about environment. It was seen there is a strong positive relation ( $R = .868$ ) between eco-friendly familiarity and attitude towards conservational behavior of the students. It was also found that attitude of students was changed in different age groups of students (Özden, 2008; Rupani, 2017). On the basis of gender, no significant difference was found in all the dimensions of environmental awareness, such as health and hygiene, natural life, forestry, contaminants, population increase and biological issues. The study found that female students got higher mean score than the male in items related to health and hygiene, natural life, forestry, contaminants, and issues of environment. It showed that girls have a better level of awareness than boys in these dimensions. On the other hand boys could only score well about rapid and speedy change in population. It was also found that on the basis of locality significant difference exists in environmental awareness as a whole. Respondents belonging to the urban areas were found to be more aware of their environment than the students who were living in rural areas (Kang & Grewal, 2014).

Past studies have shown that the teachers' involvement with their students cannot be ignored because it was found in the previous study that teachers have had greatly involved in the polishing of the personality traits of their students and found that teachers were inclined to make their students more friendliness (Ullah et al., 2019). The researchers also stated that the Pakistani community needs to introduce peace education in their courses and should teach peace education courses at various levels. The study (Amin et al., 2020) found that peace education is a tool that aware prospective teachers about global awareness. Peace education can also be linked to environmental awareness. The researchers (Akram et al., 2020) also stated the weather adjustment and food problems faced by the students when they come into the new environment. These findings might be due to environmental changes. Any person can face problems when he/ she enters a new environment (Akram et al., 2020).

Our study is different from the aforementioned literature in view of the objectives by which we intended to find out the level of environmental awareness of secondary school students in the Khyber Pakhtunkhwa province of Pakistan.

### **Limitations of Research**

Data was collected by self-developed test. It might be better if an interview was arranged to collect data about the causes of environmental changes but due to extensive geographically scattered area of province, it could not be arranged. Further, since the researchers had faced severe time and limitation sources to reach the participants therefore interviews were not possible for the researcher.

### **Research Methodology**

In this study, we have used a quantitative approach to collect the data using a survey for the proposed research to analyse the expected outcomes. The study was delimited to the public secondary schools of Khyber Pakhtunkhwa province. The students enrolled in these schools were taken as population of the study. The total enrolment in these schools was 372349 (233304 boys and 139045 girls). Enrolled students in the 10th class were 169782, consisting of 105193 boys and 64589 girls ( $N=169782$ ). We used a multistage sampling technique for the selection of samples. We randomly selected seven districts from

seven divisions of Khyber Pakhtunkhwa province (one district from each division) at first stage. Then we pointed out the number of boys/girls secondary schools in sampled districts at second stage. Then we randomly selected 10 schools (5boys and 5 girls) from sampled out districts at 3rd stage. In the 4<sup>th</sup> and last stage, we selected randomly one section of science and one section of humanities students of class 10<sup>th</sup> from each sampled school. All students of these sampled sections were our respondents. So the sample was consisted of 2796 students (n=2796).

Mostly the sampled students were from an age range of 15 to 17 years of age which 1433 were male students and 1363 were female students, 1378 were from science and 1418 humanities groups, 1722 were from urban, and 1074 were from rural areas; thus the n=2796. It is shown in the following table 1.

Table 1: *Showing total number of sampled students*

	Status of students	n
<b>Gender</b>	Male	1433
	Female	1363
Area	Urban	1722
	Rural	1074
Science and Humanities	Science	1378
	Humanities	1418
<b>Total</b>		2796

Source: ASC2017-18

### ***Instrumentation-Validity and Reliability***

We have used a self-developed test as a tool for data collection from sampled respondents. It consisted of items related to the environment and its protection. These items were extracted from topics given in science subjects of the 10<sup>th</sup> class related to the environment and its conservation. The subject matter related to the environment and environmental conservation included in the science syllabus at this level contains information about the greenhouse effect, ozone layer depletion and its protection, radioactivity, the effect of man's activities on natural climate, components of the ecosystem, types of pollution, ways to decrease pollution, depletion of the ozone layer, maintenance of mineral deposits and natural resources, the importance of wildlife, population, poverty, increasing urbanization, the importance of forest and increasing infertility of land. We developed a test containing 50 MCQs; among which item1 to 14 reflect the attitude of respondents regarding the causes of change in the natural environment, while items 15 to 30 reflect the student's attitude about the effect of changes and items 31 to 50 reflect the student's attitude regarding environmental conservation. We have validated our instrument in view of expert opinions from the researchers. The initial draft was prepared on 3 points Likert scale with option 1 relevant, option 2 not relevant and option 3 minor changes are needed. Then it was administered to 25 experts for its content validity and it was validated in the light of the suggestion of these experts. Lawshe content validity ratio is commonly used to measure content validity (Ayre & Scally, 2014) was applied to each item and those items were selected for the test which had the CVR value  $\geq 0.78$ .

Pilot testing was done for the reliability of the test. 40 students were randomly selected from two high schools of district Dera Ismail Khan and the self-developed test was administered to them. Cronbach's alpha was calculated through SPSS version 20 to measure the reliability of the test. Those items were included in the test which has Cronbach's alpha value greater or equal than 0.78.which is acceptable in social sciences. The content Validity of the tool is given in table 2 below.

Table 2: *Validity and Reliability of Instrument*

Showing Content Validity Ratio Cronbach's Alpha Score of Test Area	No. of Items	CVR (Min-Max score)	Cronbach's Alpha
Items 1 to 14 show the attitude about environmental changes	14	0.78- 0.84	.874
Items 15 to 30 show attitude about the effects of environmental changes	16	0.78- 0.93	.836
Items 31 to 50 show attitude about environmental conservation	20	0.78-0.90	.852
Total	50	0.78-0.93	.863

### Objectives of the Study

The main objective of the study was to find out the difference in attitudes of secondary school students about the causes of environmental changes. The main objective is then divided into sub-objectives.

- To find the difference in the attitude of secondary school students about the causes of environmental changes on the basis of status (science group/humanities group)
- To find the difference in the attitude of secondary school students about the causes of environmental changes on the basis of gender (male/female)
- To find the difference in the attitude of secondary school students about the causes of environmental changes on the basis of area (urban/rural)

### The Hypotheses of the Study

The main hypothesis of the study was divided into sub-hypotheses based on demographics such as the status of students (science group & humanities group), gender (male/female), and area (urban/rural). For ease of the readers, the main hypothesis is written as follows;

**H<sub>01</sub>:** In Khyber Pakhtunkhwa province, about the causes of environmental change, there lies no significant difference in attitudes of secondary school students.

The above central hypothesis is further divided into the following three sub-hypotheses regarding science and humanities groups, gender, and area. The sub hypotheses are reiterated as follows;

**H<sub>01a</sub>:** In Khyber Pakhtunkhwa province, about the causes of environmental change, there lies no significant difference in attitudes of science and humanities students at the secondary school level.

**H<sub>01b</sub>:** In Khyber Pakhtunkhwa province, about the causes of environmental change, there lies no significant difference in attitudes of male and female students at the secondary school level.

**H<sub>01c</sub>:** In Khyber Pakhtunkhwa province, about the causes of environmental change, there lies no significant difference in attitudes of urban and rural students at the secondary school level.

### Results

The data were put on the SPSS software and were later analyzed by using descriptive and inferential statistics. Results generally found that students of the 10th class in the said province were aware of the causes of environmental change in the Khyber Pakhtunkhwa province of Pakistan. The central hypothesis, the sub hypotheses, and their analysis are written in the following order for the ease of the readers. The results are tabulated in the following order as well.

### **Main Hypothesis**

**H<sub>01</sub>:** In Khyber Pakhtunkhwa province, about the causes of environmental change, there lies no significant difference in attitudes of secondary school students.

*Sub Hypotheses:* The major hypothesis is divided into the following three sub-hypotheses based on demographic variables of students' science and humanities group, gender, and area. Each hypothesis is given as follows.

**H<sub>01a</sub>:** In Khyber Pakhtunkhwa province, about the causes of environmental change, there lies no significant difference in attitudes of science and humanities students at the secondary school level.

The following table 3 shows the hypothesis that was made about the students of science and humanities groups to examine the level of awareness regarding the causes of environmental change. A T-test was applied to compare both groups.

Table 3: *Difference in Awareness about Causes of environmental changes on the basis of status*

Status of students	n	Mean	SD	t-cal	t-tab	P value
Science students	1378	1.81	.14	8.42	1.96	0.00
Humanities students	1418	1.71	.16			

The above table 3 shows that the level of awareness of science and humanities students has shown significant differences because the level of awareness that is shown by science and humanities students is statistically significant ( $t= 8.42$ ;  $p=0.00$ ) at the alpha level of 0.05. Based on this result, the null hypothesis ( $H_{01a}$ ) is rejected because it shows significant differences in the level of awareness regarding the causes of environmental change in science and humanities students groups. It meant that levels of awareness of science and humanities students were not the same. By seeing the mean values, the students of the science group ( $M=1.81$ ) had shown better attitudes than the students of the humanities group ( $M=1.71$ ).

**H<sub>01b</sub>:** In Khyber Pakhtunkhwa province, about the causes of environmental change, there lies no significant difference in attitudes of male and female students at the secondary school level.

Table 4 shows the hypothesis about the male and female students to examine the level of awareness regarding the causes of environmental change. A T-test was applied to compare both groups.

Table 4: *Difference in Awareness about Causes of environmental changes on the basis of gender*

Gender of respondents	n	Mean	SD	t-cal	t-tab	P value
Male	1433	1.77	.16	2.60	1.96	0.009
Female	1363	1.75	.15			

The above table 4 shows that the level of awareness of male and female students has shown significant differences because the level of awareness shown by male and female students is statistically significant ( $t= 2.60$ ;  $p=0.00$ ) at the alpha level of 0.05. Based on this result, the null hypothesis ( $H_{01b}$ ) is rejected because it shows significant differences in the level of awareness regarding the causes of environmental change in male and female students groups. It meant that levels of awareness of male and female students were not the same. By seeing the mean values, the male students ( $M=1.77$ ) had shown a better level of awareness than the female students ( $M=1.75$ ). The current study results showed that male students ( $M=1.77$ ) have a high awareness level compared to female students ( $M=1.75$ ).

**H<sub>01c</sub>:** In Khyber Pakhtunkhwa province, about the causes of environmental change, there lies no significant difference in attitudes of urban and rural students at the secondary school level.

Table 5 shows the hypothesis about the urban and rural students to examine the level of awareness regarding the causes of environmental change. A T-test was applied to compare both groups.

Table 5: *Difference in Awareness about environmental changes on the basis of locality*

Area	N	Mean	SD	t-cal	t- tab	P value
Urban	1722	1.78	.15	3.48	1.96	0.001
Rural	1074	1.74	.16			

The above table 5 shows that the level of awareness of urban and rural students has shown significant differences because the level of awareness that urban and rural students show is statistically significant ( $t= 3.48$ ;  $p=0.00$ ) at the alpha level of 0.05. Based on this result, the null hypothesis ( $H_{01c}$ ) is rejected because it shows significant differences in the causes of environmental change in urban and rural student groups. It meant that levels of awareness of urban and rural students were not the same. By seeing the mean values, the urban students ( $M=1.78$ ) had shown a better level of awareness than the rural students ( $M=1.74$ ). The current study results showed that urban students ( $M=1.78$ ) have a high level of awareness compared to rural students ( $M=1.74$ ).

## Discussion

It was found that students of secondary schools in the province of Khyber Pakhtunkhwa are well aware of the causes of environmental changes and they have a positive attitude about it. These results were also endorsed by Mutisya and Barker's study (2011) which analyzed the awareness of students about the degradation of the environment. Results confirmed that students were well aware of the degradation of forests and uncontrolled cutting down of flora in their areas. So it was concluded that students could identify all ecological issues (Mutisya & Barker, 2011).

The results of the present study showed that students of the science group ( $M=1.81$ ) have a high level of awareness as compared to the students of the humanities group ( $M=1.71$ ). It was found that the students belonging to the science group were more aware of the causes of environmental changes. These results are in line with the results of Singh and Dogra who found that Muslim girls of Bareilly belonging to science subject have a higher level of awareness than the art students (Singh & Dogra, 2014). Similarly, Lee (2008) who discovered in his research that students belonging to the science groups are more aware of the rapid dilapidating environmental conditions also endorsed these results. Majority of the respondents considered the rapidly growing population as the main cause of the environmental problems (Lee, 2008). It might be due to the factor that students of the science group possess more knowledge and activities related to the environment, due to which they find more time for studying the environment. They are provided more information and subject matter about the environment in their science subjects than the humanities students. Further, the students of the science group might focus on the environment and other factors. Thus, they showed a high level of awareness about the causes of environmental change.

The present study revealed that male students ( $M=1.77$ ) showed higher level of awareness about the causes of environmental changes than female students ( $M=1.75$ ). These findings are in contradiction with the findings of Singh and Dogra who explained that Bareilly graduated Muslim girls showed a higher level of environmental awareness than the boys did (Singh, & Dogra, 2014).

Male students showed a higher level of awareness as they may be more inclined toward education and found more time for activities that addressed environmental changes, sustainability, and other factors. They have more interaction with the environment and more exposure to it than female students. Further, the female students might have a busy schedule at home and with other family members. Thus, female students showed a low awareness of environmental changes, sustainability, and other environmental factors.

It was found in this study that students belonging to urban areas ( $M=1.78$ ) have a more positive attitude toward environmental awareness than rural students ( $M=1.74$ ). Kang and Grewal who found that urban students showed a higher level of awareness than rural students regarding the environment (Kang & Grewal, 2015) also endorse these results. It might be because urban students are more inclined toward social media sites like Facebook, Instagram, and Twitter. They find more time for factors that make them aware of their environment and what the environment destroys. At the same time, rural students might have a busy schedule with the daily chores in their homes. Thus, urban students showed a high level of awareness about environmental conservation.

## **Conclusion**

This study examined the level of awareness about the causes of environmental changes of 10th-class students in Khyber Pakhtunkhwa province of Pakistan. All human beings, especially students at the school level, must understand the fragility of our environment and the importance of its protection to cope with global warming. Overall, the results of the study revealed a satisfactory level of awareness about the causes of environmental changes among 10th-class students. It also revealed that science students showed a greater amount of awareness than students of the humanities section about the causes of environmental change. Gender-wise, male students had a higher level of awareness as compared to female students about the causes of environmental change. Similarly, area-wise urban students had a higher level of awareness as compared to rural students about the causes of environmental change.

## **Recommendations**

Based on current study results, the researchers recommended that besides a satisfactory level of awareness, the curriculum still needs to be improved and adapted to the environmental changes so that all students across the Khyber Pakhtunkhwa province, as well as the country, could cope with the changes. In addition, the secondary level curriculum must undergo changes, and effective lessons should be placed specially in the curriculum of the humanities group, which addresses the matters that harm our precious environment. In addition, effective environmental activities must be conducted for students to make them aware of what gives benefits the environment.

## **Future Research Directions**

This study was conducted on the students of the 10<sup>th</sup> class of Khyber Pakhtunkhwa province. This may be replicated by taking students from other classes. Students of primary, elementary, higher secondary, and higher classes may be taken as populations for further research. The study was delimited to the Public schools only. A comparative research regarding environmental awareness of students of public and private schools may be conducted. The effect of the education and awareness of parents on the environmental awareness of the students may be investigated.

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