

# Exploring the Effects of Deforestation on Communities Living Style: A Sociological Study in Indus Riverine Areas of Dera Ghazi Khan

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<https://doi.org/10.62345/jads.2024.13.3.104>

## Abstract

*Deforestation is the eradication of trees, clearing of plants, or burning of forests on a large scale to accomplish all the local, regional, and global needs of the expanding population. Climate change has severely influenced both the development of human lifestyles and existence, together with food scarcity, wildlife destruction, and risky meteorological conditions problems. A total sample sizes of 225 citizens were selected from District Dera Ghazi Khan. In the first stage, 3 Tehsils of District Dera Ghazi Khan e.g. (Dera Ghazi Khan, Kot Chutta, & Taunsa,) were selected. In the second stage, 3 riverside union councils were selected from each Tehsil through a convenient sampling technique. In the third stage, 25 citizens were selected from each union council. Data was collected through an interview schedule and examined by 'The Statistical Package for Social Sciences' (SPSS). Obtained results indicate that deforestation increases in the community (99.1%) and climate change also happens in the community (99.1%) deforestation is one of the major causes of climate change (99.6%) and climate change is due to deforestation (100%). It was concluded that negative impact of deforestation on the local ecosystem (95.6%); deforestation caused air and water pollution in the community (99.6%); deforestation increases the frequency and severity of natural disasters in the region (96%); deforestation changes in the landscape, such as soil erosion or changes in the flow of rivers (95.5%); the forests are mitigating in climate change and preserving biodiversity (96.4%). The bivariate analysis showed that more will be deforestation vs more will be climate change; more will be negative impact on the local eco-system. So, all the hypothesis results are accepted after the analysis of the data.*

**Keywords:** Deforestation, Climate Change, Global Warming, Forest & Droughts, Soil Erosion.

## Introduction

Deforestation is the eradication of trees, clearing of plants, or burning of forests on a big scale to meet the expanding population's local, regional, and global needs (Repetto & Lash, 1997). The percentage of the land area covered by trees was 30% in 1990. However, after that, the number of trees decreased by 13 million hectares annually. This means that 78,000 square miles of forest surface were removed each year for agricultural and other uses depending on the location (Shukla et al., 1990). Deforestation plays a major role in the increasing temperature of Earth because of huge emissions of atmospheric greenhouse gases, mainly carbon dioxide, contributing considerably to global warming. The decline in forest areas leads to the release of stored carbon, exacerbating the greenhouse effect and rising temperatures globally. This

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process upsets the natural equilibrium, since trees operate as carbon sinks, absorbing carbon dioxide and regulating climate (Faradiba, 2023).

Osoba et al. (2019), mentioned that 'deforestation is a reduction of the forest cover typically as a consequence of forests being destroyed for agriculture and other land activities'. The year 2011 was recognized by the United Nations as the 'International Year of Forests' which acknowledged sustainable management of forests leading to a severe concern over forest cover in the world (Chakravarty et al., 2012). This is converting the forest cover to other permanent non-forest uses like built-up use, industries, agricultural and grazing lands, and so on (Van & Bulte, 2000). Almost, thirty percent of the total land surface of the world, or 3.9 billion hectares is considered as forest area. However, it is also estimated that the actual area under forest is more than six billion hectares (Bryant et al., 1997). Russia, China, Canada, Brazil, and the USA are among the richest countries in terms of forest resources and contribute around fifty-three percent of the total forest resources of the world. Currently, forests have not changed significantly in North and Central America nor forests have increased in European countries during the last 10 years. In the region of Asia, the two countries that registered a large gain in the amount of forestry areas were China and India because of numerous tree-planting activities. While from the other side Southern America, Oceania, and African countries experience a large number of annual forest cover loss (FAO, 2010).

The elimination of forests either deliberately or naturally at a large scale is termed deforestation which affects the quality of the land unfavorably and brings negative impacts to the environment. It reflects that deforestation is affecting the soil properties, water availability, and depletion and loss of habitat (Treydte et al., 2006). Some of the current issues arising from the absence of interest at the government level, money that leads to power, due to the reaping of the prized wealth from the forest, again of population boost, and artificial urbanization are some of the well-known factors. Other most typical causes comprise; business, development, fertile land for cultivation, grazing, use as fuel, and most especially, chopping for timber. In the country, the negative impacts of deforestation were also highlighted and they include among others soil erosion, imbalance in the water cycle, loss of habitat by animal species, flooding, drought, climate change, global climate warming, the rising of greenhouse gases, destruction of the homeland, displacement of the culture, loss of agricultural and business revenue (Faiza et al., 2017).

Deforestation has numerous social and environmental complications associated with it that may even make human life uncomfortable (Nijman & Nekaris, 2010). It is a global issue of environmental conservation but would have a higher impact on Nigeria due to the high incidence of deforestation. Consequently, deforestation negatively impacts the environment as a whole, the economic aspect, and people, in general. Deforestation causes climate change and global warming (Peacock, 2013; Inyang et al., 2014). Deforestation has adverse influences on the environmental, economical, and social aspects. One of the prime issues that exist in Pakistan is the supply-demand gap. In 2018 the usage of wood in the year was 52.6 million cubic meters, which was 29 times less than the planned volume. The answer is 5 cubic meters in 1993 and it clearly shows that there has been a significant change over the last 25 years. Today, Pakistan has an annual production rate of 14 million cubic meters while its consumption was 52 million cubic meters in 2020. Thus, the consumption of wood is playing a pivotal role in the deforestation of forests (Tabbasum, 2020).

The globe has witnessed a large loss of its forests notably in tropical regions which store 892 metric tons of carbon per hectare as a total quantity and deforestation in tropical forests has substantial effects on climate. The role of deforestation of the tropical forests which are very important carbon stock and which are conventionally linked with long-term dangerous impacts on the environment such as global warming, reduction in the number of species, and soil degradation gives evidence of how the two variables of deforestation and environmental

change are positively related. In Ghana, Excessive logging, bush burning, mining and quarrying, unsustainable farming practices, and settlement and accompanying infrastructure building are the key drivers accounting for the loss of forests (Tindan, 2013).

Deforestation, refers to the large-scale removal or burning of trees for different uses, resulting in environmental effects. Deforestation operations alter carbon flow in the soil, vegetation, and atmosphere. Therefore, when such forests are cut down, the soil becomes degraded, through carbon that is released through plant litter on the forest floor, albedo, and through an increase in hydro-meteorological risks (Amjad et al., 2019). Deforestation is still current and profound in many countries of the world and declines the amount of trees and animals. A few factors such as reduction in size and scale, separation, and division of environment have placed many species of animals and plants in a more vulnerable position in the list of extinction. These conservation and management methods should meet the expectations of the households and that is why the formulated hypothesis regards the information about the factors that contribute to deforestation as valuable. As our understanding identifies, this was the foremost research study that explored villagers' perceived beliefs of the deforestation factor and their implications on the overlay of Riverine forests that is a way of food security for society (Hassan et al., 2016).

### **Objectives of the Study**

1. To investigate the direct consequences of deforestation on the local ecosystem.
2. To examine how deforestation increases environmental changes.

### **Hypothesis of the Study**

1. More will be deforestation; more will be climate change.
2. More will be deforestation; more will be negative impact on the local ecosystem.
3. More will be deforestation; more will be air pollution in your community.

### **Review of Literature**

Guo and Shahbaz (2024), asserted that as a part of the 2030 international sustainable development plan, the United Nations has proposed to provide activity in global goal 15 concerning the sustainable preservation of the earth's terrestrial ecosystems, adoption of sustainable forest management, combating of the desertification, sustainable land management and goal to stop the biotic project prevention (Balsalobre-Lorente et al., 2024; Yu et al., 2024). Besides international cooperation and national law, the above ambition would call for the immediate activation of financial resources. The change of sign for 2012 indicates that, for the decade after 2010, there has been a net yearly loss of 4.7 million hectares of forests all over the world. This report also states that shortages of certain products will be a problem for both industrialized and developing countries in the future and deforestation is one of them. According to the Deforestation alert released by Pakistan's Ministry of Climate Change, Pakistan had 648 thousand hectares of tree cover in 2010. Seventy-four percent of the country's land surface. For Pakistan during the year 2022, the area of tree cover lost was calculated to be 49 ha which is equivalent to 19.3 kilotons of CO<sub>2</sub> emissions (Global Forest Watch; 2023). The extraction of forests and economic development has led to environmental deterioration in Pakistan (Lin & Ullah, 2024).

Saleem et al. (2024), the study revealed that the Forestry industry is considered one of the key GHG emitters worldwide as Deforestation and Forest Degradation contribute approximately 6000 million tons of carbon dioxide to the yearly emission of GHGs in the world. The poor nations contribute to seventy-five percent of emissions because their survival is in trees. Pakistan is among the top-mentioned countries contributing to the emissions of GHGs and one of its subdivisions, is the Azad Jammu and Kashmir (AJK). According to Ullah et al. (2020), deforestation is still a foremost issue of concern to ecological movements in most developing

countries in particular, Pakistan is one of the worst affected countries as far as deforestation is concerned. Osoba *et al.*, (2019), mentioned that 'deforestation is a reduction of the forest cover typically as a consequence of forests being destroyed for agriculture and other land activities'. One important concern created by deforestation is the influence on the global carbon cycle dubbed Green House Gases (GHG) impacts (Ruth *et al.*, 2007).

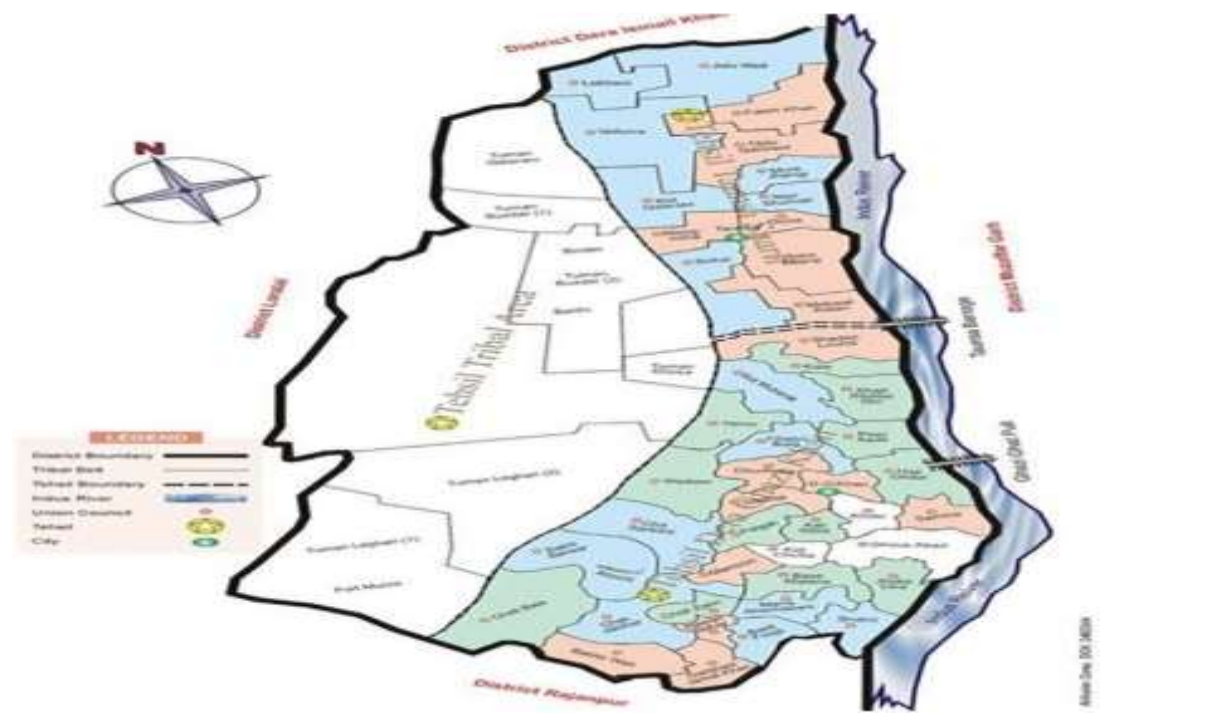
Ullah and Khan (2023), the study highlighted that deforestation remains one of the most common threats to the environment that directly affects the dispersion of the forest through territorial borders. It is just as well-defined as the shrinking of the forest, which process happens most often due to deforestation for several causes. Pakistan is one of those nations that falls under the very high deforestation group of countries in the world. Ali *et al.* (2023), only claim that deforestation is the aggravating factor of climate change in emerging nations. Listed by the 'German Watch Report 2020', Pakistan falls into the 7th rank of most affected countries due to climate change effects. Deforestation could be termed as an existential threat to the country that has lost most of its forests to this natural vice. Thus, the forecast of the main components is critical to minimizing deforestation. According to Minhas (2023), deforestation is the constant transmission of one forestry habitat to a new one. The flow of carbon within soil, shrubs, trees, and the atmosphere is influenced by deforestation. Deforestation produces soil corrosion, carbon secretions from plant breakdown in wooded areas floor, the reflecting phenomena, and acceleration of hydro-climatic risks.

## Materials and Methods

The research was conducted in 2024 in the Indus Riverine belt region of District Dera Ghazi Khan. The Riverine forest covers 13514 acres in total within the district. The District Dera Ghazi Khan contains a total of 89 rural union councils (35 D.G. Khan, 24 Taunsa, and 30 Kot Chutta) among these 9 union councils were chosen for the conduction of the research. D.G. Khan (Drahma, Sabra Nachan, and Samina) Taunsa Shareef (Morejhangi, Nari-Janubi, and Downa), and Kot Chutta (Jhuk Utera, Hazara, and, Jhakar Imam Shah). The population of the research was constituted of the Indus River belt located in District Dera Ghazi Khan. The research was descriptive by design having a quantitative approach. A convenient sampling procedure was utilized in order to obtain an adequate sample size. The sample size was 225 respondents. In the current research, data was gathered from 25 respondents from each of the 9 union councils total of 225 respondents from the Indus Riverine belt areas in District Dera Ghazi Khan. Data was collected through interview schedule and analyzed using the Statistical Package for Social Sciences (SPSS). The present study employed bi-variate analysis, specifically Chi-square and Gamma tests.

## Results and Discussion

The data pertaining to this study, titled " Exploring the Effects of Deforestation on Communities Living and Structure: A Sociological Study in Indus Riverine Areas of Dera Ghazi Khan" was collected, structured, and analyzed using the research methods elucidated in the preceding chapter. The analysis and interpretation of data are crucial components of scientific inquiry.

**Figure 1: Map of district Dera Ghazi Khan showing the study sites****Table 1: Socio-economic profile of the respondents (N=225)**

Demographics	Variables	F (%)
Age (years)	17-25	71 (31.6)
	26-34	95 (42.2)
	35-43	37 (16.4)
	44 & above	22 (9.2)
Education Levels	Illiterate	36 (16.0)
	Middle	31 (13.8)
	Matric	26 (11.6)
	Intermediate	56 (24.9)
	Graduation & above	76 (33.8)
Marriage Status	Unmarried	65 (28.9)
	Married	160 (71.1)
Occupation	Agriculture	63 (28.0)
	Poultry Farming	21 (9.3)
	Job	64 (28.4)
	Labor	17 (7.6)
	Self-Business	60 (26.7)
Main family income source	Agriculture	67 (28.9)
	Poultry Farming	52 (23.1)
	Business	54 (24.0)
	Job	52 (23.1)

*Source:* Field survey 2024

Age is viewed as the number of years for which a specific living individual has existed, and is usually recorded as the number of calendar years at the onset of birth. It is usually interpreted



as a ratio variable because of several statistical advantages it has over other levels of measurement; For instance, measuring age as an ordinal variable will not give the distinction between two or more ages in a measured range that measuring age as a ratio variable will. The above table age categories depicted 17 years to 44 & above years old. The majority of 42.2% of respondents were from the age group 26-34 years (adults), followed by 31.6% of respondents from the age group 17-25 years (emerging adults), 16.4% belonged to the age group 35-43 years (young adults) and 9.8% were from 44 & above years. It is evident from these results that adults from the 17-34 years age group found almost 74% of the study population whereas the rest of almost 26.2% of respondents were from middle and old age adults. Knowledge is one of the most composite features that may influence a person's perceptions and approach to viewing and interpreting a specific social process. Likewise, Kajembe et al. (2012) pointed out that they too considered that an enhanced level of education was needed which was an essential component of gradually reducing the deforestation rates. Therefore the variable under consideration for investigation was 'Educational level' and the corresponding education data was presented by the researcher. The above table shows that the majority of the respondents' 33.8% educational level was graduation & above, followed by 24.9% were intermediate, 11.6% were matric, and 13.8% were their level of education middle. While 16% of respondents were illiterate above table indicated the results. The majority 71.1% were married whereas 29.9% were unmarried. Therefore, an estimated 90% of rural respondents lead a married life. The above table data showed that (28.4%) of respondents replied about the occupations in which they were doing jobs at the time of the survey, whereas 28% were in agriculture, (26.7%) were doing self-business, and (9.3%) were working as laborers. While (7.6%) of respondents replied they were doing poultry farming. Therefore, the results showed that (83.3%) of respondents replied their occupations were job, agriculture, and self-business. The above table data showed that 29.8% of respondents replied their main family income source was related to agriculture, 24% replied their income source belonged to business, and 23.1% replied their main source of income was to job, whereas 23.1% of respondents said that their main source of income was related to poultry farming. The results show that the majority of the respondents about their main family income source was agriculture. Whereas the proportion of respondents' main family income sources were job, business, and poultry farming.

**Table 2: The respondents were categorized according to frequency and proportional percentage based on deforestation increases in your community (N=225)**

Deforestation increases in the community	Frequency	Percent
To great extent	175	52.0
To some extent	48	48.0
Not at all	2	0.9
Total	150	100.0

*Source: Field survey 2024*

Deforestation, refers to the large-scale removal or burning of trees for different uses, resulting in environmental effects. Deforestation operations alter carbon flow in the soil, vegetation, and atmosphere. Therefore, when such forests are cut down, the soil becomes degraded, through carbon that is released through plant litter on the forest floor, albedo, and through an increase in hydro-meteorological risks (Amjad et al., 2019). Deforestation is still current and profound in many countries of the world and declines the amount of trees and animals. The results show that a high proportion (77.8%) of respondents replied 'to great extent' "deforestation increases in their community", followed by (21.3%) of respondents were replied 'to some extent'. While 0.9% replied 'not at all' deforestation increases in their community.

**Table 3: Association between more will be deforestation and more will be climate change**

At what extent do you agree that deforestation is increasing in your community	At what extent do you agree that climate change is happening in your community			Total
	To great extent	To some extent	Not at all	
To great extent	173	2	0	175
To some extent	22	25	1	48
Not at all	0	1	1	2
Total	195	28	2	225

**Chi-square Value= 151.396<sup>a</sup>**      **Degree of Freedom= 4**  
**Level of Significance= 0.000**      **Highly Significant**  
**Gamma Value= 0.982**

In this table, the Pearson Chi-square = (151.396<sup>a</sup>) which in turn has a probability value of = (0.000) which is less than (0.05), meaning that the variables were revealed to have a statistically highly significant relationship in this study. The Gamma value (0.982) reveals that there is a positive significant correlation between the variables. P-value = (0.000) shows the existence of a highly significant relationship between “more will be deforestation and more will be climate change” is highly significant. Deforestation has numerous social and environmental complications associated with it that may even make human life uncomfortable (Nijman & Nekaris, 2010). It is a global issue of environmental conservation but would have a higher impact on Nigeria due to the high incidence of deforestation. Consequently, deforestation negatively impacts the environment as a whole, the economic aspect, and people, in general. Deforestation causes climate change and global warming (Peacock, 2013; Inyang, et al., 2014). According to the quantitative figures obtained by the researcher to support the hypothesis it can be stated that if more is going to deforestation more is going to climate change. Therefore, taking into account the obtained results, it shall be noted that, the specified hypothesis with the title “More will be deforestation; More will be climate change” is statistically deemed acceptable.

**Table 4: The association between more will be deforestation and more will be negative impact on the local eco-system**

At what extent do you agree that deforestation is increasing in your community	At what extent do you agree that the negative impact of deforestation on your local ecosystem					Total
	St A	A	N	D	St D	
To great extent	145	27	2	1	0	175
To some extent	21	20	1	3	3	48
Not at all	2	0	0	0	0	2
Total	168	47	3	4	3	225

**Chi-square Value= 38.932<sup>a</sup>**      **Degree of Freedom= 4**  
**Level of Significance= 0.000**      **Highly Significant**  
**Gamma Value= 0.673**

In this table, the Pearson Chi-square = (38.932<sup>a</sup>) which in turn has a probability value of = (0.000) which is less than (0.05), meaning that the variables were revealed to have a statistically highly significant relationship in this study. The Gamma value (0.673) reveals that there is a positive significant correlation between the variables. P-value = (0.000) shows the existence of

a highly significant relationship between “more will be deforestation and more will be negative impact on the local ecosystem”. Climate change constitutes a severe danger to the ecosystems of Pakistan, which extends a broad variability of habitats from the coastal areas alongside the coast of the Arabian Gulf to the northern highland areas. Rising temperatures and fluctuating weather patterns are altering ecosystems and disturbing the life cycles of many species of animals and plants (Fatima, 2022). According to the quantitative figures obtained by the researcher to support the hypothesis it can be stated that “more will be deforestation and more will be negative impact on the local eco-system”. Therefore, taking into account the obtained results, it shall be noted that, the specified hypothesis with the title "more will be deforestation; more will be negative impact on the local eco-system" is statistically deemed acceptable.

**Table 5: The association between more will be deforestation and more will be air pollution in the community**

At what extent do you agree that deforestation is increasing in your community	At what extent do you agree that deforestation caused air and water pollution in your community			Total
	St A	A	St D	
To great extent	138	37	0	175
To some extent	32	15	1	48
Not at all	2	0	0	2
Total	172	52	1	225

**Chi-square Value= 26.698<sup>a</sup>**      **Degree of Freedom= 4**  
**Level of Significance= 0.003**      **Significant**  
**Gamma Value= 0.270**

In this table, the Pearson Chi-square = (26.698<sup>a</sup>) which in turn has a probability value of = (0.153) which is greater than (0.05), meaning that the variables were revealed to have a statistically highly significant relationship in this study. The Gamma value (0.270) reveals that there is a positive significant correlation between the variables. P-value = (0.153) shows the existence of a non-significant relationship between “more will be deforestation and more will be air pollution in the community”. According to Ullah et al., (2020), deforestation is still a foremost issue of concern to ecological movements in most developing countries in particular, Pakistan is one of the worst affected countries as far as deforestation is concerned. Numerous factors influence deforestation and degradation of the forest, including the following; Thus, the present research work was led to identify the causes of deforestation in ‘Basho Forest Gilgit Baltistan, Pakistan’. This investigation gathered information on factors that lead to deforestation and degradation in order to bring out possible favorable methods of sustainable forests that cause impacts on the physical environment including air pollution, soil erosion, and temperature increase. According to the quantitative figures obtained by the researcher to support the hypothesis it can be stated that “more will be deforestation and more will be air pollution in the community”. Therefore, taking into account the obtained results, it shall be noted that, the specified hypothesis with the title "more will be deforestation; more will be air pollution in your community" is statistically deemed acceptable.

## Conclusion

Deforestation plays a major role in the increasing temperature of Earth because of huge emissions of atmospheric greenhouse gases, mainly carbon dioxide, contributing considerably to global warming. The decline in forest areas leads to the release of stored carbon, exacerbating the greenhouse effect and rising temperatures globally. Deforestation has adverse



environmental, economic, and social consequences. Still, in Pakistan, the demand is high while the production is quite low. Now referring to the total use of wood in the year 2018 it constitutes 52.6 million cubic meters compared to 29. It has reduced from 5 cubic meters in 1993 to 3000 cubic meters showing a drastic change in 25 years. Today Pakistan being a developing country yields only 14 million cubic meters of wood while the import consumer was 52 million cubic meters in 2020. This research is about exploring the effects of deforestation and climate change on communities' living and structure, a sociological study in the Indus riverine areas of Dera Ghazi Khan. The objectives of the study were to "explore the effects of deforestation and climate change on communities' living and structure" and to find out the views of people about the importance of forest significance in the prevention of climate change, reducing risk to the ecosystem, and biodiversity. The study also finds out the consequences of climate change such as agricultural productivity, extreme weather situations, droughts, floods, rainfall, and human health that are affected by climate change. Providing alternate sources of livelihoods, control of corruption, awareness campaigns, and reforestation can decrease the deforestation rate. It was concluded that more will be deforestation vs. more will be climate change; more will be the negative impact on the local ecosystem; and more will be air pollution in your community. So, all the hypothesis results are accepted.

## **Recommendations**

### **Supplies of another type of fuel**

The availability of another fuel option will help in decreasing the level of deforestation (Khan et al., 2013). The government should deliver biogas plants to rural communities. It can go a long way in easing the pressure that would have otherwise been exerted on the forests.

### **Elimination of corruption**

Thus, when controlling the corruption, the deforestation can be minimized. There is still corruption in the Department of Forests they must maintain good governance and also enforce the laws pertaining to the forest department absolutely.

### **Awareness creation**

The creation of awareness to the people could reduce the activity of deforestation. The rural people did not know the value of the existence of forests or the demerits associated with the act of deforestation. Hence, the kind of awareness regarding the usefulness of forests and the demerits of using axes on trees is crying for attention. Observation can be defined as a serious factor of awareness (Alarima, 2011). Seminars by the administration regarding the subject as well as extension services should be offered to reach out to the rural folks and thereby help remedy the allied issues of deforestation.

### **Reforestation**

In the same regard, all the interviewees opined that reforestation can minimize the degree of deforestation in the riverine belt regions. Afforestation may be considered as a step towards the administration of deforestation. Some of the recommendations that were made include; an awareness campaign should be embarked on to ensure people are motivated to participate, and every citizen of Society should be encouraged to play a role in ensuring that the forest is restored to its natural state (Khan et al., 2013). This action will assist in reducing the available CO<sub>2</sub> within the atmosphere and sequestering it through carbon storage because of the ignition of fuels and other human activities. Trees thus gain carbon from the atmosphere in the development of their food by the procedure of photosynthesis which reduces the negative impacts of carbon on the environment. Trees also play a role in enhancing the best climate by purging the air for everyone's and every animal's comfy environment.

### Policy on the protection of forests

In each and every year, seven thousand two hundred hectares of forest land is being degraded or changed to other uses in Pakistan. This will definitely go on forever if Pakistan fails to conserve major parts of forest areas in the near future. Pressure on the population is accredited as the main cause of deforestation and forest degradation even though it has other complexities that surround the issue. However, the people residing in close proximity to the wooded areas used the timber to meet some of the fundamental needs highlighted by the FAO in 2011. The government must make a policy to reduce poverty in this country and also a determined policy to prevent the people from having contact with the forest and also to make the forest department stronger.

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