Journal of Media Horizons
ISSN: 2710-4060 2710-4052 Volume 6, Issue 5, 2025

IMPACT OF DEFORESTATION ON CLIMATE CHANGE

Tehreem shafiq[1], Amna Iftikhar[*2], Sawera Mustafa[3]

[1,3]*Mphill scholar*
[*2]*Lecturer at Hazara University*

[1]tehreemshafiq3@gmail.com, [*2]amnaiftikhar.sociologist@gmail.com, [3]isaweravirk1@gmail.com

DOI:https://doi.org/10.5281/zenodo.17264919

Keywords
Climate Change, Forest Area & Agricultural Area

Article History

Received: 12 August 2025
Accepted: 22 September 2025
Published: 04 October 2025

Corresponding Author: *
Amna Iftikhar

Abstract
One of the primary natural forces regulating and determining a region's climate, weather patterns, and CO2 content are forests. Rapid urbanization and industrialization are associated with major increases in deforestation and a rise in the average global surface temperature.
This research aims to evaluate the impact of deforestation on the climate change in Pakistan. Pakistan was chosen as the country for data collection and independent and dependent variable data were obtained at the country level from 1990 to 2020. The source of data is the data bank of World Bank. The results of present study showed that deforestation significantly impact the climate change in Pakistan.

INTRODUCTION

A region's climate pattern has an impact on its way of life, economy, and culture. Majority of the world's population is affected by the socioeconomic effects of climate change. alterations in annual precipitation, temperature, and sea level that affect biological processes over a lengthy period of time, or as a result of the frequency and severity of hydro-melting of glaciers and permafrost, which could result in many meters of sea level rise, the thermohaline circulation breaking down which in turn could result in significant changes to the northern hemisphere's climate, and El Nio Southern Oscillation and Asian Monsoon System regional shift phenomenon. The problem of "forests and water" has taken centre stage on the political agenda with the adoption of the Sustainable Development Goals (SDGs) in the 2030 Agenda (D Ellison et al., 2017). Filoso et al. (2017) review 308 research cases and find that reforestation reduces the overall yearly water production in 80% of the cases. According to the literature, the paradoxical effects of deforestation increasing yearly water production are explained by the fact that trees themselves use water, which evaporates in the air and reduces streamflow. According to Bosch and Hewlett (1982), who reviewed 94 research, an increase in forest area results in a reduction in the amount of water flowing through streams. Andréassian (2004) reviews 137

examples and concludes that reforestation decreases water output whereas deforestation increases it. In developing nations, the effects of climate change are devastating because of a lack of capability in light of the shifting climate. Developed nations effectively thousands of the world's poorest people's human rights via excessive the use of natural resources. continual greenhouse gas emissions from sea level rise, and other hydro-meteorological occurrences are being caused by developed nations. Unpredictability due to the season. repercussions of Water scarcity and food scarcity (failed harvests) are uncertain seasonal variations. mounting health concerns, destroyed dwellings, and rising sea levels are all harming Forests serve as carbon dioxide filters naturally. atmospheric dioxide absorption. Compared to what they emit, they store more carbon, in their natural form, are referred to as CO2 sinks. Approximately Forests, which store more carbon than any other type of vegetation, cover more than 25% of the earth's land surface. Large amounts of carbon are stored in forests; according to Pan et al. (2013), approximately 360 Pg of the 450–650 Pg of carbon stored in vegetation (IPCC, 2013) is in forest vegetation. Forests hold more than 800 PgC when soil carbon is included (Pan et al., 2013), which is nearly as much carbon as is now stored in the atmosphere. Over 75 percent of the carbon is in terrestrial environments. Additionally, terrestrial ecosystems that jointly remove 29% of yearly CO2 emissions (11.5 PgC; Friedlingstein et al., 2019) mostly remove carbon from the atmosphere through their forests.

Research Objective

This research aims to evaluate the impact of deforestation on the climate change in Pakistan.

3- Literature Review

3.1 Human Effects

Climate change compromises agricultural production, resulting in decreased crop yields and increased susceptibility to pests, diseases, and extreme weather events, putting food security in jeopardy. The hazards to global food security are increased by this circumstance, which also makes hunger and malnutrition problems worse.Climate change, which is defined by changing precipitation patterns and increasing evaporation, is a result of scarce water supplies. The availability of sanitary services, agricultural water supplies, and clean drinking water are all negatively impacted by this scarcity. One-third of the world's woods have vanished since the end of the last major ice age, which ended 10,000 years ago (Kump,2004).Climate change has an impact on the prevalence of diseases, such as those spread by vectors like dengue fever and malaria, as well as respiratory disorders. This effect offers serious health hazards and aids in the spread of these diseases.Extreme weather conditions and heat waves can directly harm your health. Displacement and migration: Increasing frequency of catastrophic weather events and rising sea levels may cause communities to be uprooted both within and across national boundaries. Political and socioeconomic hardships could be experienced by climate refugees.

3.2 Financial Effects

Extreme weather conditions and increasing sea levels cause damage to infrastructure, which includes buildings, roads, and energy networks. Infrastructure maintenance and construction are very expensive.

Economic sectors impacted: Agriculture, forestry, fisheries, tourism, and other industries are all impacted by climate change. Growing circumstances that are changing, supply chain disruptions, and the depletion of natural resources can lead to financial losses and job relocation. Increased healthcare costs and strain on healthcare systems are brought on by the health effects of climate change, such as heat-related disorders and the spread of infections. The frequency and severity of extreme weather occurrences have increased insurance costs, which has an effect on people, businesses, and governments. Collaboration on a global scale, actions to reduce greenhouse gas emissions, the implementation of adaptation plans to deal with current and future changes, and a move toward a low-carbon, sustainable economy are all necessary for combating climate change.

3.3 Deforestation as a Climate Change Contributing Factor:

When trees are destroyed to make way for other land uses, such farming or ranching, it is referred to as

deforestation. The permanent conversion of forests to another habitat is one restriction on the notion of deforestation. Some of the planet's richest and most diversified ecosystems may be found in tropical woods. In tropical woods, more than half of all species on earth are found (Scheffers,2012).The carbon flux in the soil, plants, and atmosphere is impacted by deforestation operations. Deforestation leads to soil degradation, albedo effect, increase of hydro-meteorological dangers, carbon release from plant breakdown left on the forest floor, and deterioration of soil. In addition to adding a lot of carbon to the atmosphere globally, forest loss greatly reduces one of the main pathways for removing carbon from the atmosphere for a very long time (Houghton and Nassikas, 2018). Forests cover about 30% of the total area of the planet. Through physical, chemical, and biological processes that control the hydrological cycle, temperature stability, and atmospheric composition, forests have an impact on the worldwide climatic pattern. Since 1990, the primary forest area has significantly decreased over 300 million hectares. Approximately 13 million hectares of forests were lost naturally or converted to other uses between 2000 and 2010, which is less than the 16 million hectares per year over the prior decade. In addition to causing a decline in biodiversity, this also increases global warming by 12 to 15% by releasing CO2 into the atmosphere and preventing further CO2 storage. Tropical forests, which hold the greatest amount of aboveground biomass and have one of the fastest carbon sequestration rates per unit land area (Harris et al., 2021), face the greatest deforestation pressure (FAO, 2020). A total of 42 million square kilometers of tropical, temperate, and boreal areas are covered by forests, which provide significant social, economic, ecological, and aesthetic advantages to people and natural systems.

They support biodiversity, provide food, provide economic and medicinal value, regulate the hydrological cycle, preserve soil cover, and are beautiful and enjoyable places to visit. Forests also affect climate through atmospheric exchanges of water, carbon dioxide, energy, and other chemical species.

Forests have a low surface reflectivity, which helps mask snow's highly reflecting properties and help regulate the temperature of the planet's surface. They are a key resource for reducing climate change since they are essential in controlling the water cycle through evapotranspiration. Scientific simulations show that tropical forests have high rates of evapotranspiration, which increases rainfall and lowers surface air temperatures. Deforestation, on the other hand, causes surface temperatures to rise, carbon dioxide emissions to increase, soil quality to deteriorate, and surface runoff to increase, resulting in unforeseen and disastrous floods.

Deforestation changes regional and global climate patterns, causing catastrophic rainstorms followed by protracted dry spells. When native rainforests are cleared to create place for controlled tree plantations, some forestry activities in the tropics might be categorised as deforestation (Pendrill, 2019).The rate of deforestation has significantly increased over the past few decades as a result of growing urbanization and changes in land usage. As a result, there have been an increase in severe hydro-meteorological events and disruptive global climate patterns.

Pakistan has recently been hit by severe cyclones, droughts, and floods. These incidents have resulted in fatalities, evictions, loss of livelihoods, and infrastructural damage. The likelihood of these and other natural hazards occurring more frequently and becoming more severe in the upcoming years is further increased by the possibility of climate change. The sharp reminder that Pakistan is one of the nations most susceptible to the effects of climate change is provided by this.

Climate change is projected to have a variety of negative effects on Pakistan. Among these include decreased agricultural output, increasing extremes in water availability, increased erosion and seawater intrusion along the coast, and a rise in the frequency of extreme weather occurrences.

Pakistan has experienced devastating floods, droughts, and cyclones in recent years that have killed hundreds of people, uprooted thousands more, destroyed livelihoods, and damaged infrastructure. Rich nations of today in Europe and North America needed more and more resources, such as land for agriculture, wood for electricity, and building materials, as a result of population expansion (Mather,1999).A harsh reminder that Pakistan is one of the nations most vulnerable to the

consequences of climate change is the possibility that these and other natural calamities could become more frequent and severe in the decades to come.

Reduced agricultural production, greater water supply unpredictability, increased coastline erosion and seawater intrusion, and a rise in the frequency of extreme climatic events are just a few of the numerous effects that climatic change is predicted to have on Pakistan. It is necessary to integrate climate change into national strategy and policy in order to address these risks, as well as to make climate-smart investments in enterprises, infrastructure, and human capital.

Climate change could be a significant challenge for Pakistan. In order to address these issues, government and civil society must work together on all fronts. Pakistan's yearly mean temperature has increased by about 0.5°C over the previous 50 years. In addition, over the past 30 years, the number of days with a heat wave has increased by over fivefold. Although there have historically been large variations in annual precipitation, there has been a modest rise over the past 50 years. Additionally, over the past century, the sea level along the coast of Karachi has increased by about 10 millimetres. Under a central global emissions scenario, predictions indicate that Pakistan's annual mean temperature may increase by 3°C to 5°C by the end of this century, with even greater increases of 4°C to 6°C likely under higher emissions scenarios. While there isn't predicted to be a major long-term trend in average annual rainfall, there will likely be a lot of inter-annual variation. A further 60 centimetres of sea level rise is anticipated by the end of the century, which may have an effect on the low-lying coastal areas south of Karachi toward Kati Bander and the Indus River delta.

Pakistan is projected to experience increasing river flow fluctuations due to increased variability in precipitation patterns and glacier melting under future climate change scenarios. As a result of increased evaporation rates, the demand for irrigation water may increase.

In the last century, the sea level along the coast of Karachi has increased by about 10 millimetres. According to a central global emissions scenario, the annual mean temperature in Pakistan is predicted to increase by 3°C to 5°C by the end of this century. Higher yields of wheat and basmati rice are predicted to drop and may shift production north, depending on water availability. There may be less water available for hydropower production. Due to increased air conditioning needs, warmer temperatures are expected to result in an increase in energy consumption. A decline in the efficiency of nuclear and thermal power plant generation may result from warmer air and water temperatures. Extreme heat waves may result in an increase in mortality. High rains and flash floods may put additional demand on urban drainage systems. Storm surges and sea level rise might harm coastal infrastructure and way of life.Crop varieties with greater heat and drought tolerance may be created or used, irrigation infrastructure may be updated and water-saving technologies used, integrated watershed management is implemented, catchment areas are reforested, more water storage is built, the energy mix is diversified by investing in small hydropower projects and renewable energy, weather forecasting and warning systems are improved, and critical infrastructure may be retrofitted. In order to achieve climate-resilient development, Pakistan's National Climate Change Policy of 2012 outlined the need to incorporate climate change into the nation's most economically and socially vulnerable sectors. In Pakistan, spending on climate change-related issues accounted for almost 6% of the federal budget between 2010 and 2014, primarily in the energy and transportation sectors. Pakistan intends to reduce up to 20% of its projected greenhouse gas emissions by 2030, as stated in its Nationally Determined Contribution to the Paris Agreement under the United Nations Framework Convention on Climate Change, subject to the availability of international grants to cover the estimated $40 billion in cumulative abatement costs. The estimated range of the nation's annual adaptation needs is $7 billion to $14 billion.

Pakistan's susceptibility to the effects of climate change is well known and accepted. The country has regularly witnessed catastrophic weather events during the past ten years, including floods, droughts, glacial lake outbursts, cyclones, and heat waves. These occurrences have had terrible effects on both human life and property, and they have hurt the nation's economy. For instance, the 2010 flood disaster cost the lives of 1,600 people, inundated

38,600 square kilometres, and resulted in $10 billion in damages. The Karachi heat wave in June 2015 also tragically claimed the lives of nearly 1,200 people.

3.4 South Asia's deforestation and climate change:

The largest ice cover outside of the Himalayas occurs in the Hindu Kush-Himalayan mountain chain. the Arctic area, which has more than 100,000 kilometers of glacial cover. Forth Pole. One of the world's most intricate and varied mountain systems

Here are the sources of about ten of Asia's major rivers: This system of mountains extends over 3500 miles, traversing some of the driest places on earth. It ascends for nearly every zone of life on Earth is located at an altitude of roughly 8 km and lies at the location where people are most densely populated. It is acknowledged as an environment that is exceedingly susceptible to global warming. Some of the most potential natural solutions to the issue of keeping global warming below 1.5–2 degrees Celsius involve the preservation, growth, and better management of the world's forests (Griscom et al., 2017; Roe et al., 2019). The area poses a significant risk of regular natural disasters, a persistent danger to people in the Himalayan region, and further downstream, it is anticipated that the frequency and severity of climate change will increase.

Climate change has an impact on the Hindu Kush-Himalaya region and downstream areas. Climate change poses a particular hazard to areas like the Indo-Gangetic plains.

A significant portion of the population relies on climate-sensitive livelihoods, which makes them more susceptible to climate change. poverty and a lack of ability to cope The Himalayas are more likely to experience the negative effects of climate change. The peak For their fuel needs, inhabitants rely significantly on wood. As a result of this, there has been a rapid increase in deforestation over wide areas, raising the risk of flooding, landslides, rapid glacier melting, dwindling freshwater supplies, and droughts in the area.

Countries, especially in the Himalayan region, experience flooding. South Asia has recently been hit by unprecedentedly severe flood disasters that have been disastrous. Deforestation has had substantial detrimental effects in this region, dramatically upsetting the stability and patterns of the climate. 15% of the world's forest land is in Asia. The effects of deforestation are far worse than everywhere else on the globe. It is a result of their influence. influencing factors of forest cover on the local hydrological cycle, the Asian monsoon pattern, and circulation patterns that have an impact on the entire world in addition to the region. Several of these negative effects would cause the following to change.

Climate change and deforestation are closely related and have a big impact on each other. There are notable effects from their interaction. Deforestation is the intentional removal, extraction, or destruction of forests or other regions covered with trees. It is generally brought on by human activities including the harvesting of timber, the growth of agricultural, mining operations, and infrastructure construction

Forest land will be permanently converted to non-forest uses through this method.

3.5 Changing Climate

Climate change is the phrase used to describe long-term changes in regional or global climate patterns brought on by higher atmospheric concentrations of greenhouse gases like carbon dioxide. The effects of evapotranspiration and surface roughness are reduced at higher latitudes, where incoming solar energy is extremely seasonal (Anderson et al., 2011; Li et al., 2015.Long-term changes in global or regional climate patterns brought on by human activities like the use of fossil fuels, deforestation, industrial operations, and agricultural practices are referred to as climate change. For a number of reasons, deforestation and climate change are strongly related. The following significant details underline the connection between deforestation and climate change:

Emissions of carbon dioxide: Forests serve as important carbon sinks, removing carbon dioxide (CO_2) from the atmosphere and storing it in soil, plants, and trees. As seen by current legislation in Congress (such as H.R. 2454 and S. 1733) as well as international debates, such as the Copenhagen climate conference in December 2009, policies targeted at limiting deforestation are key components of a plan to reduce carbon emissions. But when forests are destroyed or burned, the carbon that has been stored there is released as CO_2, which

heightens the greenhouse effect and causes global warming.

Loss of Biodiversity: Forest habitats for millions of plant and animal species are destroyed by deforestation. Ecological balance is disturbed, ecosystem resilience is weakened, and ecosystems become more susceptible to the effects of climate change as a result of this loss of biodiversity. Global biodiversity loss is mostly caused by habitat loss(Maxwell,2016). When we clear forests, we obliterate the habitats of several rare species and irreversibly alter these ecosystems.

Changes to Water Cycles: Forests are important regulators of water cycles because they store and absorb rainfall, releasing it gradually into rivers, lakes, and groundwater. This process is interfered with by deforestation, which results in decreased water availability, increased soil erosion, and modifications to local and regional climate patterns

Feedback Loop: Deforestation intensifies the impacts of climate change as well as its causes. As a result of causes like droughts and wildfires, climate change can render forests more vulnerable to deterioration and destruction through factors including rising temperatures, changing precipitation patterns, and an increase in extreme weather events.

Indigenous people Affected: A large number of indigenous people rely on forests for both their economic well-being and cultural traditions. In addition to endangering their way of life, deforestation worsens social injustices, uproots these people, and continues environmental and social injustices.

Understanding how deforestation and climate change are related can help us maintain forests and promote sustainable practices to lessen the effects of climate change and safeguard communities and the environment. A "development" track frequently characterises the Forest Transition (Rudel, 1998). Best in Class Addressing deforestation and mitigating climate change require concerted efforts and global cooperation. Some key solutions include:

Forest Conservation and Reforestation

Protecting existing forests and implementing sustainable land management practices can help reduce deforestation. With the growth of forests over the previous two centuries, they have nearly reached their pre-1000 AD levels (Mather,2004).Efforts focusing on reforestation and afforestation strive to rejuvenate and establish fresh woodlands, thereby enhancing the absorption of carbon and promoting biodiversity. Countries often develop their forest cover along a U-shaped curve, which is predictable (Hosonuma,2012).Although they ultimately reach the so-called "forest transition point," when they start to recover more forests than they lose, they lose forests as people rise and the need for fuel and agricultural land rises.

Renewable Energy Transition:

Switching from fossil fuels to renewable energy sources like solar and wind power reduces greenhouse gas emissions, which tempers climate change and lessens the need for deforestation related to energy production.

Sustainable Agriculture:

By promoting sustainable agricultural practices like agroforestry and organic farming, you can lessen the need to clear land for farming, prevent or slow down deforestation, and cut greenhouse gas emissions from the agriculture industry.

Regulation and Policy:

It is essential to implement strong laws, rules, and international agreements to combat deforestation and climate change. Climate change and deforestation are two interrelated problems that pose serious risks to the sustainability of our planet. Widespread forest destruction and its effect on the environment have serious repercussions that call for rapid intervention.

Deforestation is mostly caused by human activities including logging, agriculture expansion, and infrastructural development. Ecosystems are harmed by this harmful practice, which also produces carbon dioxide (CO2) that contributes to the greenhouse effect and global warming.

Long-term changes in global and regional climatic patterns are being brought on by climate change, which is being fueled by rising greenhouse gas concentrations like CO2. Rising temperatures, changed precipitation patterns, and an increase in extreme weather occurrences are the results of this. Sadly, deforestation exacerbates climate change, resulting in a hazardous feedback loop.

Deforestation has an impact on climate change that goes beyond carbon emissions. Ecosystems are disrupted by the loss of forests, which also causes a loss of biodiversity, increasing their susceptibility to the effects of climate change. Deforestation also modifies the water cycle, reducing water availability, accelerating soil erosion, and altering local and regional temperatures.

Human populations, particularly indigenous people who depend on trees for their way of life and traditional customs, are negatively impacted by deforestation and climate change. Their way of life is at danger, and deforestation keeps social injustices alive, resulting in environmental injustice.

We need to work together to overcome this situation. Initiatives for conservation and reforestation are essential for safeguarding current forests and rehabilitating degraded areas. By switching to renewable energy sources, greenhouse gas emissions are decreased, which lessens the demand for deforestation for energy production.By limiting land conversion and agricultural emissions, promoting sustainable agricultural techniques like agroforestry and organic farming helps reduce deforestation. Fighting deforestation and reducing climate change require effective laws, rules, and international agreements like REDD+.

We must take immediate action. We can work toward a sustainable and resilient future by aggressively tackling deforestation and mitigating climate change. We all have a responsibility to preserve the delicate balance of our planet's ecosystems, protect our forests, and reduce greenhouse gas emissions. Only then can we possibly hope to lessen the terrible consequences of deforestation and climate change, ensuring a better future for future generations.

Climate change is the phrase used to describe long-term modifications in local or worldwide weather patterns that are mostly brought about by human activities such the use of fossil fuels, deforestation, industrial operations, and agricultural practices. Global temperatures rise over time as a result of heat being trapped in the atmosphere due to an increase in greenhouse gases, such as carbon dioxide. The effects of climate change are extensive and have an impact on many facets of our planet. Rising temperatures cause glaciers and polar ice to melt, which causes sea levels to increase and coastal areas to flood. Increased frequency and severity of storms, droughts, and other extreme weather events are caused by changes in precipitation patterns.

Also under risk from climate change are ecosystems and biodiversity. Climate change disrupts habitats, leading to species' migration and extinction as well as changes in ecological connections. Ecosystems' resilience and stability are threatened by biodiversity loss.

Furthermore, socio-economic effects of climate change exist. Agriculture, water resources, human health, and infrastructure are among the affected industries. Climate change can affect crop yields and food security, which can cause social unrest and economic instability. Heat waves and the development of diseases pose threats to human health, while disturbances in the supply of water intensify resource competition.

International cooperation and group efforts are necessary for climate change mitigation. Three crucial tasks are switching to renewable energy sources, increasing energy efficiency, and lowering greenhouse gas emissions. Furthermore, it is essential to adapt to the changing climate through resilient infrastructure, sustainable land management, and disaster preparedness.

Addressing climate change presents an opportunity for improvement as well as a necessity for the environment. We can create a more resilient and sustfuture for future generations by acting proactively to decrease emissions, safeguard ecosystems, and advance sustainable development.

Methodology

Pakistan was chosen as the country for data collection and independent and dependent variable data were obtained at the country level from 1990 to 2020. The source of data is the data bank of World Bank.

Dependent Variable: Climate Change (CO2 emissions (metric tons per capita))

Independent Variables: Agricultural Land of Pakistan (sq. km), Forest Area of Pakistan (sq. km)

Data Analysis and Results

Model summary table of linear regression provides the part of dependent variable which is explained by

predictor variables. 26.6% of CO_2 emission is depend upon forest area and agricultural land area.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.266[a]	.37	.002	.10122

a. Predictors: (Constant), Agri_Land, Forest_Area
b. Dependent Variable: Climate Change

To explain the dependent variable with respect to independent or predictor variables following regression equation format is used.

$Y = a + b_1X_1 + b_2X_2$

On the basis of Coefficients table of Multi Linear Regression output, regression equation for current sample can be written as

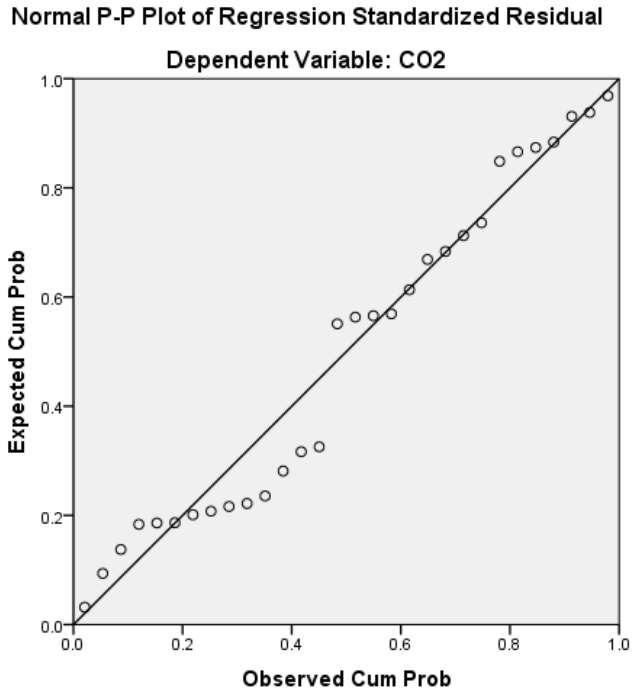
Climate Change= 131 + (218*Forest Area) + (189*Agricultural Land)

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	Sig.
		B	Std. Error	Beta	
1	(Constant)	131	0.38		0.02
	Forest_Area	218	0.2	113	0.01
	Agri_Land	189	0.03	267	0.04

a. Dependent Variable: Climate Change

Moreover, the value of the sig. is less than 0.05 in both basis which significantly predicts that forest area and agricultural land significantly predict the climate change in Pakistan



Conclusion

The results of present study showed that deforestation significantly impact the climate change in Pakistan. Devastating cyclones, droughts, and floods have recently hit Pakistan. The 2010 flood claimed 1,600 lives and caused $10 billion in damage. In Karachi in 2015, the heat wave resulted in more than 1,200 fatalities. Natural disasters linked to climate change could increase in frequency and severity during the ensuing decades. There are many implications that climate change is predicted to have on Pakistan, including an increase in the frequency of extreme weather events, a decrease in the amount of water available, and a decline in agricultural output. To tackle these concerns, climate change must be included into national strategy and policy. The science and policies of Pakistan's response to climate change are thoroughly examined in this book. Forests protect the surface of the soil, preserve biodiversity, and The hydrological cycle, together with other elements, helps to lessen the consequences of climate change on the ecosystem. There is an increase in urban areas due to population growth and urbanization.

6.1 Recommendations

Forest management is a practical method for addressing the growing

Impacts of climate change, especially in areas with mountains.

Regulations governing land use and forest conservation should be faithfully carried out. And with the approval of the neighbourhood.

To facilitate effective afforestation, community awareness and training must be organized forest preservation, too.

REFERENCES

Forest management plan based on comprehensive benefit model - researchgate. (n.d.-a). https://www.researchgate.net/publication/369468852_Forest_Management_Plan_Based_on_Comprehensive_Benefit_Model

Chaudhry, Q. U. Z. (2017, August 24). *Climate change profile of Pakistan*. Asian Development Bank. https://www.adb.org/publications/climate-change-profile-pakistan#:~:text=Catastrophic%20floods%2C%20droughts%2C%20and%20cyclones,of%20more%20than%201%2C200%20people

Gul, D. M. (2019, August 2). *Can a living lab foster climate resilience in Punjab?*. Medium. https://medium.com/@mohsengul/can-a-living-lab-foster-climate-resilience-in-punjab-beb4f15c94c2

Ali, M. (2020, March 8). *Can the Pakistan Environment Trust get the country to take climate change seriously?*. Profit by Pakistan Today. https://profit.pakistantoday.com.pk/2020/02/10/can-the-pakistan-environment-trust-get-the-country-to-take-climate-change-seriously/

Climate change profile of Pakistan - Pakistan. ReliefWeb. (2017, August 25). https://reliefweb.int/report/pakistan/climate-change-profile-pakistan#:~:text=Pakistan%20potentially%20faces%20a%20major,by%20roughly%200.5%C2%B0C

NewsDesk. (2023, June 16). *Need for climate-smart investment*. Daily The Patriot. https://dailythepatriot.com/need-for-climate-smart-investment/

Deforestation and its impacts on climate change an overview of Pakistan. (n.d.-a). https://www.researchgate.net/publication/311862203_Deforestation_And_Its_Impacts_On_Climate_Change_An_Overview_Of_Pakistan

Location of principal archaeological sites, paleoenvironmental sites ... (n.d.-c). https://www.researchgate.net/figure/Location-of-principal-archaeological-sites-paleoenvironmental-sites-and-geographic_fig8_223760030

Congressional Research Service. (2010, March 24). *Deforestation and climate change*. EveryCRSReport.com. https://www.everycrsreport.com/reports/R41144.html

Congressional Research Service. (2010a, March 24). *Deforestation and climate change*. EveryCRSReport.com. https://www.everycrsreport.com/reports/R41144.html#:~:text=Some%20limit%20the%20definition%20of,soil%2C%20vegetation%2C%20and%20atmosphere

Deforestation and its impacts on CL - papers on global change, 21, 51–60, 2014 deforestation and its. Studocu. (n.d.). https://www.studocu.com/ph/document/cavite-state-university/bs-psychology/deforestation-and-its-impacts-on-cl/43916407

Congressional Research Service. (2010a, March 24). *Deforestation and climate change*. EveryCRSReport.com. https://www.everycrsreport.com/reports/R41144.html

Ali, A., Riaz, S., & Iqbal, S. (n.d.). *Deforestation and its impacts on climate change an overview of Pakistan*. NASA/ADS. https://ui.adsabs.harvard.edu/abs/2014PGC....21....3A/abstract

Effect of deforestation on access to clean drinking water | PNAS. (n.d.-b). https://www.pnas.org/doi/full/10.1073/pnas.1814970116

Lawrence, D., Coe, M., Walker, W., Verchot, L., & Vandecar, K. (2022, March 2). *The unseen effects of deforestation: Biophysical effects on climate*. Frontiers. https://www.frontiersin.org/articles/10.3389/ffgc.2022.756115/full

Ritchie, H., & Roser, M. (2021b, February 9). *Deforestation and forest loss*. Our World in Data. https://ourworldindata.org/deforestation