CLIMATE CHANGE AS A NON-TRADITIONAL SECURITY THREAT: ANALYSIS OF THE STRATEGIES AND POLICIESOF THE GOVERNMENT OF PAKISTAN

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Dedication

I dedicate this thesis to my father Muhammad Ifraq Khan Sahab, Whose unwavering love, support, and encouragement have been my foundation throughout this journey. Your strength and wisdom have guided me, and your belief in me has kept me moving forward. I owe my achievements to the values you have instilled in me. Thank you, from the bottom of my heart, for always being there.

Acknowledgment

Alhamdulillah! All praise and thanks to Almighty Allah for granting me the strength, wisdom, and perseverance to complete this thesis. It is through His guidance and countless blessings that I was able to overcome challenges and reach this milestone. Without His mercy and support, none of this would have been possible.

Thanks to my parents for always believing in me and providing the foundation for my dreams. To my partner, whose love and support carried me through the toughest moments. And to my sisters ,brothers and my friends thank you for your advice, humor, and companionship. Thank you for believing in me, even when the path seemed uncertain. This work is a reflection of your encouragement, kindness, and trust in my abilities. I am forever grateful for your presence in my life.

Special thanks to my supervisor, Dr. Noor Fatima, in recognition of your invaluable mentorship and support throughout my research. Your dedication to your students and commitment to academic excellence have greatly influenced my growth as a researcher. Thank you for providing an environment where I could explore my ideas, overcome challenges, and ultimately succeed

ABSTRACT

One of the most important global problems that every state is dealing with is climate change. More than ever, it is obvious that the earth's climate is rapidly affecting and changing both developed and developing states. Pakistan is facing disastrous issue due to continuous change in climate i.e. extreme heat waves, unexpected heavy rainfall that leads to flood which damaged the production of food and infrastructure and cause many deaths of human being. A state will not be called safe or developed if the people are not secure. The only possible way to make a state secure by implementing effective policies and collaborating with stakeholders at all levels to deal with the unfavourable effects.

CHAPTER ONE

INTRODUCTION

The effects of climate change on water, agriculture, health, biodiversity, forests, and other socioeconomic sectors are well-established and widely visible worldwide, especially in developing nations. Global warming is bringing about a slew of interacting changes in the physical processes that are responsible for the dynamics of the climate system. Pakistan, as a developing state, is already beset by a slew of challenges, with the disastrous consequences of climate change throwing even more fuel to the fire. (Adnan, Shahid, & Mubeen, 2021). Climate change presents a multitude of dangers to the well-being and contentment of the Pakistani Islamic Republic's populace.

Climate change ranks among the most important worldwide environmental concerns confronting mankind today, having ramifications for producing food, natural ecosystems, fresh water supply, human health, and (Sujata, 2021) other aspects of life, among other things. Due to the negative consequences of climate change, severe natural disasters including storms, cyclones, floods, and droughts are already occurring more frequently and with greater severity around the world.. Since the (Hangzo, 2011) beginning of the industrial age, the climate system of earth has undergone demonstrable changes on both dimensions i.e. global and regional, as per the scientific analysis.

There is an increased chance of natural disasters with weather shifts. Those who reside in areas where climate change is anticipated to occur are more vulnerable to natural catastrophe damage. Pakistan has experienced an increase in floods in the past several years. The majority of monsoon rain-related flooding occurs in Sindh and Punjab. The mountainous

regions of KPK, Baluchistan, and Gilgit Baltistan experience the majority of the floods caused by hill torrents. Because of the monsoon rains, the majority of floods occur around the end of summer. On the other hand, high temperatures that induce glaciers to break can also result in some floods.

Floods have a negative impact on people's life, the infrastructure, the economy, and agriculture. Pakistan was devastated by a devastating flood in 2010.Their homes, crops, and livestock were devastated, and thousands of people perished. Another flood in the Chenab River struck Pakistan in 2015, killing hundreds of people and damaging several structures. In Pakistan, those who are most vulnerable to flooding reside in impoverished regions. In addition to being impoverished and without availability of basic amenities like highways and medical facilities, they are illiterate. It exacerbates the post-Flood condition.

Droughts in Pakistan have become more frequent, more severe, and endure longer primarily a consequence of climate change and overuse of water resources. Pakistan has had three instances of drought in the past 10 years, making it the most frequent natural disaster. Punjab and Baluchistan have seen many extremely severe floods since 2000. Droughts usually make food security and safety worse in semi-arid nations like Pakistan. Droughts kill people, force people to relocate for no apparent reason, and trigger famines. Certain regions of Pakistan experience droughts as a result of insufficient rainfall. Flooding was caused by heavy rain in other areas. Living in a desert increases one's risk of experiencing droughts. Famine has resulted from a severe drought that is affecting people in the Thar Desert. Many individuals have perished as a result, and infants are becoming ill from starvation. Animals suffer from drought in a variety of ways. Due to little rainfall, residents of the Cholistan andThar deserts must contend with heatwaves and a shortage of

water. Long-lasting droughts deprive the local population of food and water, harm agriculture by reducing crop yields, and kill animals and humans.

The temperature is rising every day due to climate change. The temperature on Earth has increased by around 0.14°F per decade since 1880, and more than twice as quickly since 1981, at a rate of 0.3°F every decade. 2020 was both the second and tenth hottest years on record, according to NOAA's temperature data. The average temperature of the planet has been increasing since 2005 as a result of greenhouse gases causing the environment to retain more heat. Globally, the temperature has increased within the past 30 years. Heat waves are become more frequent In certain parts of the world, including the US, as the planet gets warmer. The choices we make in the next several decades will determine how much the world warms. We know that if humanity continue to release Earth's average temperature will rise if greenhouse gases continue to be released into the atmosphere at the current rate, even if we are not quite sure how much or how quickly. Globally, the average temperature will increase by 4 to 12 degrees (Hussain, Muhammad, Chaudhary , & Syed Zaheer , May 2024)Fahrenheit. If we implement significant changes, such as using additional resources that are renewable in place of fossil fuels, the upward trend in temperature will be minimised by two to five degrees Fahrenheit. This suggests that heat waves will most likely happen more frequently and last longer.

A large and populous nation's non-traditional security is under threat from both direct and indirect means from rising temperatures and shifting weather patterns, particularly in the areas of the environment, economy, society, and politics. The agriculture industry in Pakistan, which generates 21% of the nation's GDP and employs 43.7% of its labour force, is increasingly confronted with environmental issues linked to climate change. (Khan, 2019)

With an average annual rainfall of less than 240 mm (less than 10 inches), Pakistan currently ranks among the driest nations on the globe. Pakistan allegedly falsifies its ranking among the top ten states. Pakistan is falling in second category in which it is effecting mostly by the climate change and it might be faced a (Eckstein, Kunzel, & Laura, 2021) long term consequences.

Pakistan is especially likely to have severe climate changes and facing negative consequences too. According to Bloomberg, only 5% of the country is covered with forest, compared to a 31 percent median worldwide, placing it among the six (Khan, 2019) nations most vulnerable from changing the climate.

As per a UNDP assessment, Pakistan is especially vulnerable to rising monsoon unpredictability, retreating Himalayan glaciers, and catastrophic events such as droughts and floods. Food and water insecurity will rise as a result of these developments. (Shamsi, 2021) It is a challenge that the Pakistani government is well familiar of and is working to resolve as soon as possible. Along with the TBTTP, the government promised to raise the percentage of protected areas to 15% by 2021 (they were at 12% in 2018 and are currently at above 13%). For the benefit of this generation, the next, and the generations after that, our government is certain that this needs to be done," he stated. We decided to plant trees because we believe that instead of opposing nature, we should work with it to solve our problems. (Shamsi, 2021)

As it gets set for World Environment Day on June 5, Pakistan has shown through its Ten Billion Tree Tsunami Project that it is prepared to take the lead in ecosystem restoration. With its Ten Billion Tree Tsunami Project, Pakistan has demonstrated that it is prepared to take the lead in ecosystem restoration as it gets ready for World Environment Day on June 5.

Projects like the Ten Billion Tree Tsunami are critical to avoiding, slowing, and restoring ecosystem deterioration on any continent and in every ocean, and the UN Decade on Ecological Restoration 2021-2030 was (Tsunami, June 2021) launched this year. Wide restoration programmes According to Dechen Tsering, Regional Director of UNEP for Asia and the Pacific, "projects like The Ten Billion Tree Tsunami Project are essential to the efforts of Pakistan to encourage the United Nations Decade and foster environmental regeneration." Around 7.9 billion amount was released by PSDP in 2019 to 2023. (phase 1, 2020) We've reached a critical juncture in history, & Pakistan is making headway.

Pakistan has already been dealing with a number of non-traditional security challenges for several years, which have a massive effect on its stability, growth, economic strength, and political stability. This study will provide impacts of climate change in Pakistan and focuses on the causes and reasons behind the climate change. It will also focus on the damages or loss of recourses (Khan, 2019) which is faced by the climate change. At the end study will provide expected solutions to handle climate changes challenges.

1.1 Statement of the Problem

Climate change is damaging Pakistan, and it’s a non-traditional security threat to Pakistan, due to which large areas of Pakistan is affecting, and Pakistan is facing big loss, and if it will be neglected then future generations would suffered a lot. A huge work has already been done on this topic by researchers, climate experts and educationists. Now this is the time to solve the issue of climate change disasters which is facing by Pakistan, so main focus of this study will be on how climate change or climate degradation is effecting Pakistan and also to identify the implications of climate change for sustainable development of Pakistan

1.2 Objectives of the Study

1. To explore the important factors that cause environmental degradation and the counter response of government.
2. To identify the impacts of climate change on Pakistan and implications of government on sustainable development.
3. To identify the cause of climate change and policy response of government.

1.3 Research Questions

1. What are the vulnerabilities of Pakistan viz a viz climate change and what are the response of government?
2. What are the factors that cause environmental degradation in Pakistan and the counter response of government?
3. What are the implications of government on climate change for sustainable development in Pakistan ?

1.4 Significance of the Study

This study will help to answer many questions related to changing of climate and temperature. It will also help to identify the cause of climate change, rising of temperature and extreme rainfall. It will also try to find out the solution of climate and to overcome the risk for Pakistan. It will discuss the measures and strategies taken by government and how it will be helpful in future.

1.5 Delimitation of Study

This research is limited to Pakistan and sustainable development of Pakistan.

1.6 Literature Review

Rafaela de Brito, regarding the environment-security linkage, one of the perspectives that focus on the cause and effect between environmental change and conflict is one of the more significant ones. (De Brito, 2012) On the other hand, she has warned that the securitization of climate change could lead to the militarization of a problem that calls for collaboration rather than competing each other.

There is a great relationship between cause and effect. Environmental cause and conflict have a relationship of cause and effect. If a climate is continuously changing it will definitely cause a conflict. To adopt policies to overcome the issue of climate degradation and adding different people i.e. stakeholders in it, it will give benefit and it create cooperation instead of competing. Environmental policies and control on climate change will lead towards state cooperation and better world.

According to Thomas Homer-Dixon (Homer-Dixon, Jul 22, 2001) Degradation of the environment and "depletion of resources" interact with increases in population and disparities in resource distribution to bring about violent conflict.

Increase in population demand more resources to fulfill the need of society, resources might not be distributed in a fair mean so there is a great chance of corruption in countries like Pakistan because it does not have such resources to fulfill the need and feed each and every person in a society because poverty rate is high, public try to feed their self by their own using wrong sources. To avoid such situations in Pakistan need to make strong policies and strategies to tackle the issue.

According to Lieven, as he argues that the security of Pakistan is most seriously adversely affected by climate change, which is the most serious threat among all types of

external and internal threats. (Lieven, 2012) These dangers pose significant obstacles to Pakistan's progress toward achieving its economic potential.

Climate change is a most serious threat for Pakistan because glaciers are melting and Pakistan does not have dams to store water, it is giving water shortage and in near future Pakistan would face more water crisis. Pakistan also produce electricity through water, today industries, factors and all departments need to work on electricity due to the shortage of water Pakistan is facing load shedding almost 4 to 6 hours and it effect the economy of Pakistan badly. Sometimes due to heavy rainfall and melting of glaciers damaged the infrastructure and also effect the agriculture as Pakistan's economy is depending on agriculture, these are the internal threats. External threat is Pakistan's water is depending on India, India is building dams on Pakistan's water and uses that water as per their need, at the time of heavy rainfall India open dams towards Pakistan and Pakistan faced flood and on other days utilize water as per their need.

Divya Sriakanth wrote in an article that in 21th century the world shifted from traditional wars towards the non-traditional wars , in 20th century the world was facing WW1 and WW2 and then cold war, but in 21st century interstate wars replaced by the threats which includes environment, infectious diseases, (Srikanth, 2014) economy and creating domestic security threat. It is very difficult to adopt a change and to find out their solution, to overcome the problems need immediate policies.

According to Impact of Climate Change on Life a book section which is written by Hassan HassanM.Heshmati , he says The adaptation to the adverse consequences of climate change and the avoidance of its worsening are two important aspects of the global response of civilisation. Whether planned or unplanned, adaptability is especially important in developing

countries. Policymakers need to put in place individualised adaptation plans, especially for the most vulnerable populations. Effective population health risk reduction cannot be achieved at the local level alone. International policy coordination is essential. Humans depend on healthy ecosystems and biodiversity for their food, water, and overall health. If other creatures are unable to adapt to climate change, there might be catastrophic consequences for humans. Adaptive strategies require experience and patience. Society must take action by putting policies like drinking stations and wildlife overpasses into place in order to help animals adjust to the consequences of climate change. Effective conservation action plans may be made feasible by identifying the traits that determine a species' resilience and vulnerability.As a long-term strategy, prevention is a crucial method. To protect humans and wildlife, greenhouse gas emissions must be reduced as soon as practical. If greenhouse gas emissions are drastically reduced, our climate may reach a new and maybe sustainable equilibrium. Policies that restrict the use of fossil fuels, promote the creation and application of carbon-free energy technology, and support the replanting and preservation of forests should all be supported.

According to Mubeen Adnan and Fakhara Shjaid , Number of countries are effecting by climate change but it is more risky for less developed states specially south Asian states because their economy is depending on agriculture, global warming environmental degradation effects the agriculture (Adnan, 2021) and it gives negative impact on less developed states. Pakistan is in top 10^{th} position which is affecting by climate change. Pakistan is facing many problem due to climate change their economy is going down and unable to fulfill the basic necessities.

According to Bhavana Arya and Shiromi Chaturved there is a great need to solve the issue of climate change, he is totally against the usage of coal, energy, diesel, wastage which harm the environment badly, according to him this issue will only be resolved if both public and stakeholders work on it, now only stakeholders are making policies (Chaturved, 2020) against it and public is not supporting them and using the articles which harm the environment, it is only be possible to solve this by when both stakeholders and public involve themselves into it otherwise no chance has been seen or no policy will work to counter the disaster by changing of climate.

According to Muhammad Imran, he wrote an article in newspapers about climate change, according to him change in temperature is affecting food. Agricultural production is affected by heavy or unexpected rainfalls and extreme temperature. He further added that change in temperature not only effect the urban areas it will affect the rural areas and coastal areas too. People of urban area will face heats waves and water scarcity and coastal cities will might face more heat waves, water problems and storage of food, rural will face issue in production of food and living. As per his finding Pakistan is facing more problems and is more vulnerable as compare to European countries. IPCC purposed the framework of Climate Resilient Development according to him it will not work by only planting tress there must a need of collaboration with other states and departments. (Imran, 2022) There is a need to change the values, social structure, change in ideologies, and system of politics and economics of a state. Climate change is a real threat to human health and human comfort.

According to Adeel Mukhtar Mirza, He talks on the status of climate justice and environmental rights in Pakistan, especially in relation to the legal and constitutional frameworks. how Environmental rights are implicitly guaranteed by Pakistan's Constitution

under the rights to life (Article 9) and dignity (Article 14). Citing significant Supreme Court and High Court rulings that have broadened the definition of basic rights to include environmental safeguards, he emphasises the judiciary's role in interpreting these rights to include the right to a clean and healthy environment. In the Leghari v. Federation of Pakistan case, for example, the court declared that climate change violated constitutional rights and compelled the government to take immediate steps to lessen its effects. Mirza talks about a number of other significant cases in this area. By frequently making up for political inertia, the judiciary's use of Public Interest Litigation (PIL) has been crucial in raising awareness of environmental and climate justice concerns. The article makes the case that Pakistan is extremely vulnerable to the effects of climate change, including floods, droughts, and extreme weather events, even though it contributes very little to global greenhouse gas emissions. This makes a compelling case for promoting climate justice, which holds nations with higher emissions levels more accountable for their efforts to mitigate climate change and adapt to it. Mirza recommends a number of actions to improve Pakistan's environmental and climatic justice. Enhancing legislative and regulatory frameworks, strengthening institutional capabilities, encouraging public involvement and awareness, and using global climate financing channels are a few of these.

He discussed Two famous court cases that have had a big impact on environmental law and climate change policy are the "Leghari" and "Urgenda" rulings. Asghar Leghari, a farmer in Pakistan, filed the lawsuit against the Pakistani government. Leghari claimed that the right to life and other fundamental liberties protected by the Pakistani Constitution were breached by the government's refusal to carry out its own climate change strategy. Leghari won his case at the Lahore High Court, which declared that climate change posed a "clear and present danger" to Pakistani residents. The government was ordered to create a Climate

Change Commission to oversee the implementation of Pakistan's National Climate Change Policy by the court, which declared that the government's inactivity on climate policy constituted a violation of fundamental rights. The decision is noteworthy because it acknowledges climate change as a human rights concern. In Pakistan, it established a precedent for the courts (Mukhtar, 2020)to hold the government responsible for its environmental and climate policy pledges. In a case brought by the Urgenda Foundation and 886 Dutch people, the government of the Netherlands was accused of breaching its duty of care under Dutch law and the European Convention on Human Rights by not doing enough to limit greenhouse gas emissions. The Dutch government was ordered by the District Court of The Hague to cut its greenhouse gas emissions by at least 25% by 2020 in comparison to 1990 levels after the court found in favour of Urgenda in 2015. In the context of climate litigation, the Urgenda case is regarded as a landmark decision. It was the first case in history where a court used its commitment to uphold human rights to order a government to take measures to stop climate change. The case has highlighted the importance of the court in tackling climate change and sparked similar lawsuits in other nations. The rising acknowledgement of the connection between human rights and climate change, as well as the possibility of court involvement to force government action on climate policy, are highlighted by the Leghari and Urgenda cases.

Through his work, Mirza advances our knowledge of climate justice in relation to Pakistan's legal and constitutional system. The statement highlights the significance of judicial activism in defending environmental rights and the necessity of a multifaceted strategy that integrates legal, legislative, and grassroots initiatives to address the climate issue.

1.7 Research Methodology

To analyze the climate change a non-traditional security threat to Pakistan the methods researcher has choose given below

1.7.1 Research Design

Researcher will use qualitative research method which will be analytical and descriptive in nature. It will be an exploratory research.

1.7.2 Data Collection

Secondary sources will be used for data collection i.e. research articles, journals, books, government reports, government statements and online source.

1.8 Theoretical Framework

The Theory of Planned Behavior (TPB), also known as Planned Behavior Theory, is a well-established psychological framework for comprehending and forecasting human conduct. Its applicability to climate change lies in the examination of how individuals' intentions and actions regarding (Stern, 2000)climate change mitigation are influenced by their attitudes, subjective norms, and perceived behavioral control. Here's an exploration of how the TPB can be employed in light of global warming. Within this element, individuals' personal evaluations of actions taken to mitigate climate change are scrutinized. This encompasses factors such as their beliefs concerning the impacts of warming the globe, their perceptions of the efficacy of mitigation measures, and their overall positive or negative evaluations of engaging in such actions. To encourage environmentally responsible behavior, strategies can focus on altering (Schultz, 2007)people's attitudes through educational initiatives, awareness campaigns, and the presentation of evidence highlighting the benefits of climate change mitigation. Subjective norms pertain to an individual's perception of social pressure and the influence of significant others in their life concerning climate change mitigation. This involves their perceived expectations from friends, family, colleagues, and society at large. To foster environmentally responsible conduct, it's vital to establish a social milieu where addressing climate change is considered a norm, motivating individuals to conform to these norms. Perceived behavioral control encompasses an individual's perception of how easy or challenging it is to engage in climate-friendly actions. This encompasses factors such as self-efficacy, perceived obstacles, and facilitators. To advance climate change mitigation, efforts should focus on enhancing individuals' sense of control (Kaiser, 2008)over their actions. This can be achieved by making sustainable options more accessible, affordable, and convenient. Intentions serve as a pivotal predictor of behavior

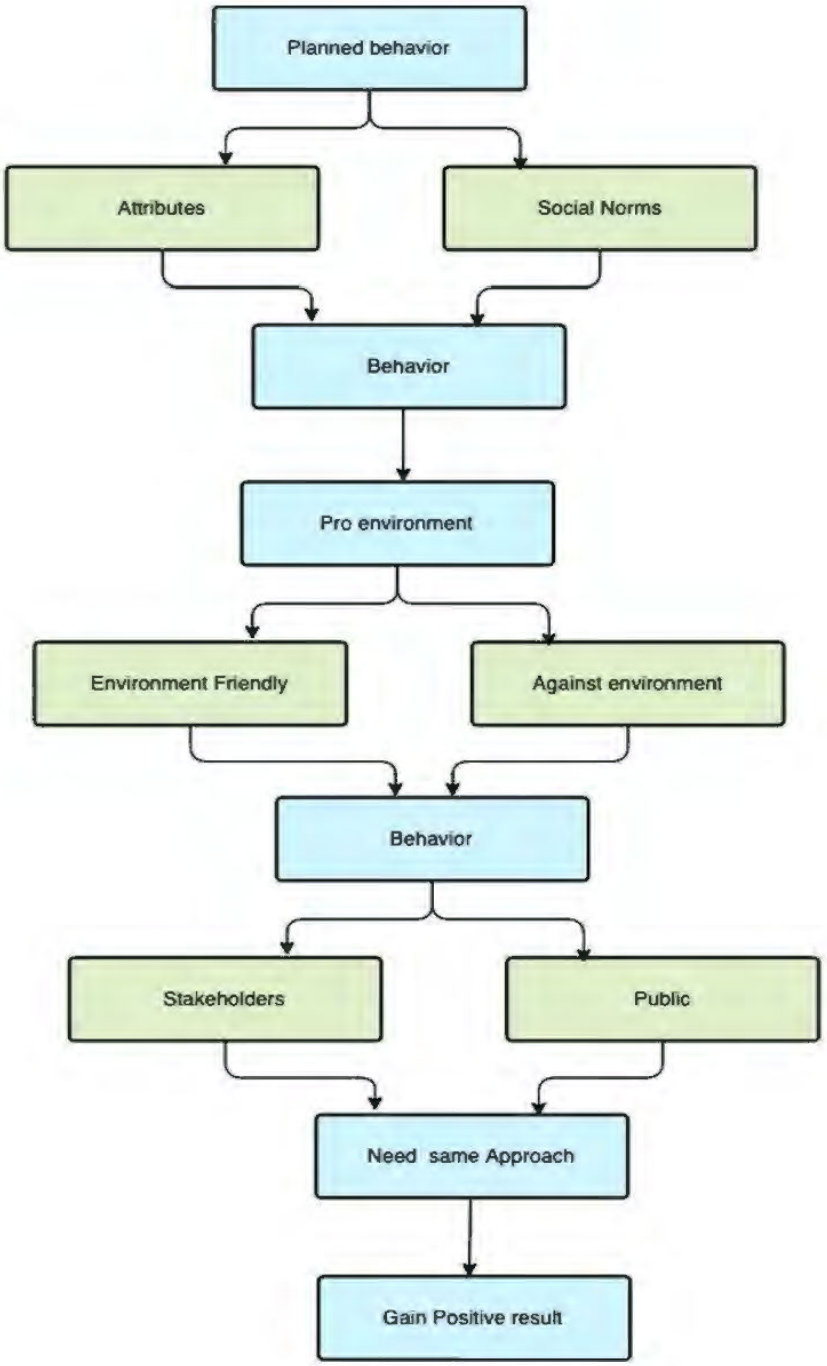
according to the TPB. People are more likely to undertake climate-friendly actions when they have strong intentions to do so. Encouraging individuals to establish specific, achievable goals related to climate change mitigation can bolster their intentions. Ultimately, the goal is to transform intentions into tangible behavior. To facilitate this transition, interventions should eliminate barriers and provide incentives, feedback, and support as individuals embark on climate-friendly actions.

In the realm of climate change, the TPB can be applied to develop interventions and campaigns that target each of these (Bamberg, 2007)components. For instance, educational initiatives can disseminate information about the consequences of climate change and the effectiveness of mitigation measures (attitude). Social marketing campaigns can work to establish social norms endorsing sustainable behavior (subjective norms). Policies and initiatives can be implemented to make sustainable alternatives more accessible and user-friendly (perceived behavioral control). By addressing these factors, the TPB.

There are some kinds of attributes, social norms we adopted in our life which develop certain behavior. Pro environmentalist is in favor of environment and they don't want to compromise on environment, things that are damaging environment they are totally against them, this is their behavior. By having this certain behavior over environment (Bhavana, 2020) they tried to find out some alternatives of that i.e. usage of energy, coal emissions, waste etc. government, NGOs, higher official or stakeholders within a state or international level they are working on it and trying to introduce environment friendly things, this is only happening in higher level, impact of this behavior is not influencing the public, industrialists, public is not taking any part to overcome the issue of climate change. It is not possible to solve this one handedly, it can only be possible if both stakeholders and public take part on it.

Planned behavior theory has direct and indirect influenced on behavioral intentions and it has been proven by evaluating TPB by different methods and on different groups and also on individuals. According to TPB attitude towards any particular behavior shows their intention towards that behavior either it is positive or not. TPB also helps to predict the intentions towards that particular behavior by individual attitudes. Basically human act socially just like their attitude. TPB is concern about those behaviors which leads an individual to their goal. TPB produced those intentions and attitudes (Williams, He, & Conners, 2018)who strong the narrative of TPB, therefore the significance of TBP cannot be ignored in climate change.

The theory of planned behavior is a significant theoretical framework that is useful because it incorporates fundamental ideas from the social and behavior sciences. Climate change policy documents emphasize the importance of stakeholder participation in the policymaking process (Ajzen, dec1991) regarding local adaptation to climate change. There are multiple theories that demonstrate human behavior and policy making but planned behavior theory is most important and strong to explain behavior and also suggest structuring and assessing behavior.



(Ajzen, dec1991)

TPB or the Theory of Planned Behaviour, is a valuable asset for governments and policymakers as they address the formidable challenge of climate change. By delving into the

ways in which individuals' attitudes, subjective norms, and perceived behavioral control shape their intentions and actions concerning climate change mitigation, governments can elevate the effectiveness of their strategies and policies aimed at cultivating environmentally responsible behaviors. An overview of TPB's potential to support governments in addressing climate change concerns is provided below.

TPB insights may be used as a guide for creating programs and policies aimed at reducing greenhouse gas emissions and encouraging sustainable lifestyles. These regulations can be adjusted to target the particular obstacles and incentives people see while adopting eco-friendly practices. Governments may create highly focused messaging and communication campaigns that appeal to people's values, beliefs, and social influences by acknowledging that attitudes, subjective standards, and perceived behavioural control all have a significant impact on intentions. Changes in social norms and attitudes on climate change may result from effective communication. Governments have the ability to actively endeavour to create a social environment in which environmentally conscious behaviour is accepted as the standard. Through the use of subjective standards, governments may motivate people to conform to social norms and increase the overall amount of effort put into mitigating climate change. To address the "attitude" component of TPB, educational activities and programs may be created to improve people's comprehension of the effects of climate change and mitigation techniques. People with better knowledge are more likely to have favourable attitudes towards mitigating climate change. Governments can get assistance from behavioural insights derived from TPB on how to influence people to make environmentally beneficial decisions. Enacting laws that increase the availability, affordability, and desirability of sustainable solutions can aid in removing obstacles to behavioural control that people may perceive. Governments can get assistance from behavioural insights derived from

TPB on how to influence people to make environmentally beneficial decisions.Enacting laws that increase the availability, affordability, and desirability of sustainable solutions can aid in removing obstacles to behavioural control that people may perceive. Governments can get assistance from behavioural insights derived from TPB on how to influence people to make environmentally beneficial decisions. Enacting laws that increase the availability, affordability, and desirability of sustainable solutions can aid in removing obstacles to behavioural control that people may perceive. It is possible to strengthen people's intentions and motivate behavioural change by encouraging them to set clear, realistic objectives in relation to climate change. Goal-setting-focused programs and initiatives are one way that governments might encourage this. (Steg, 2009)The TPB provides an organised framework for evaluating the effects of initiatives and policies related to climate change. Through the assessment of changes in attitudes, subjective norms, and perceived behavioural control, governments may determine the efficacy of their programs and implement evidence-based modifications as needed. Encouraging individuals to participate in climate change solutions and involve them in the policymaking process can foster a sense of control and ownership that is consistent with the TPB idea of perceived behavioural control.

In summary, the Theory of Planned Behaviour provides an organised framework for understanding the psychological aspects of behaviours connected to climate change. Using this paradigm, governments may create interventions, communication plans, and regulations that encourage sustainable habits and help in the critical global battle against climate change.

Increasingly, many Pakistanis are becoming aware of the harmful effects of climate change, especially as they experience firsthand the impacts like floods (such as the devastating 2022 floods), droughts, and heatwaves. As more people see the link between

climate change and their quality of life, attitudes toward adopting eco-friendly behaviors, such as water conservation or reducing plastic use, may become more positive. Pakistan is becoming more and more vulnerable to climate change, as seen by the floods of 2022 that left millions of people homeless and costing billions of dollars in damages. As a result, more and more people are realising the need of adopting sustainable behaviours, such as conserving water, planting trees (as seen by the Billion Tree Tsunami effort), and cutting back on plastic waste. Motivated by the obvious consequences of climate change, this optimistic outlook can promote eco-friendly actions.

However, there can still be a pervasive attitude among some sections of the populace that individual efforts (such converting to renewable energy or decreasing waste) are negligible or that climate change is an abstract or far-off concern. This might make adopting sustainable behaviours less urgent. However, a lot of individuals can still see climate change as an increasingly faraway or global issue that has less of an immediate effect on their day-to-day existence. This might lead to a lack of desire to modify personal behaviours, such cutting back on energy use or waste, particularly in light of the fact that many Pakistanis are more concerned about their economic survival than anything else.

Social standards and cultural influences are powerful in Pakistan, and behaviour is greatly influenced by community values. People are more likely to engage in climate-positive behaviours if environmental awareness is ingrained in these cultural norms through the efforts of religious leaders, community influencers, or educational institutions. Communities can be motivated to take climate action via programs like as tree plantings, which are associated with Islamic ideals of stewardship. In Pakistan, cultural and religious beliefs have a big influence on how people behave. If Islamic principles on environmental stewardship—

such as respecting creation and abstaining from waste—are actively incorporated into public discourse and societal standards, they can encourage sustainable actions. Religious leaders, for instance, can influence social attitudes and raise awareness of climate change by promoting environmental preservation or water conservation.

National policy also shapes subjective standards. To promote environmental responsibility, the government has launched initiatives like Clean Green Pakistan and the Billion Tree Tsunami. These government-led initiatives have the power to strengthen the positive social norm around environmentally conscious behaviour if society views them as significant and supportive. The efficacy of grassroots initiatives such as the Clean and Green Pakistan campaign, which promotes waste reduction and tree planting, demonstrates the power of community norms to shape behaviour. People are more inclined to become involved in environmental activities if they witness their neighbours and local authorities doing so. These rules might not have as much of an impact, though, in places where there is little knowledge of climate change or strong economic pressure.

People's perceived power over climate solutions will rise if they believe they have equitable access to finances and can make a difference. Urban people that have access to better public transit alternatives or renewable energy sources, like solar electricity, may feel empowered enough to lessen their carbon impact. Many Pakistanis, particularly those who reside on the countryside or economically deprived regions, might believe they lack the means or capacity to take climate-friendly action. Perceived behavioural control may be diminished by, for instance, restricted access to reasonably priced renewable energy sources, inadequate public transportation, or difficulties with recycling infrastructure. Individuals may

believe that their small contributions won't have a big impact, particularly when confronted with more systemic problems like industrial pollution or ineffective government.

The population is more inclined to form goals to engage in activities like water conservation, sustainable farming, using renewable energy sources (like solar energy), and waste management programs if they develop a positive attitude towards sustainable practices, feel that others (like family, community leaders, and the government) endorse environmental efforts, and believe they can faithfully implement green behaviours. People may be more inclined to adopt climate-friendly practices in metropolitan regions where environmental issues including pollution in the air are more pressing and climate knowledge is more widely available. For example, there has been some success with garbage management or projects to plant trees in places like Lahore or Islamabad. However, in rural places, poor infrastructure and economic hardship may make individuals less inclined to participate in such behaviours, as long-term environmental concerns are frequently subordinated to everyday survival.

The Pakistani government has demonstrated some commitment to tackling climate change with initiatives such as the Ten Billion Tree Tsunami and involvement in international climate discussions. In Pakistan, initiatives aimed at promoting climate resilience are also being undertaken by NGOs and foreign groups. These programs can increase people's intents to take part in neighborhood-level sustainability actions by bolstering their confidence in our collective abilities to combat climate change. It's possible that many Pakistanis, especially those living in rural regions, lack the information necessary to adopt sustainable behaviours or to be sufficiently conscious of climate change. The development of favourable attitudes is hampered by a lack of environmental education. Financial limitations may also lessen the

perception of behavioural control. For instance, even if someone is enthusiastic about using less energy, they could not have the money to set up solar panel.

Government programs such as the Billion Tree Tsunami rely on long-term planning, political commitment, and effective governance to succeed. Subjective norms surrounding climate action may continue to be weak if these activities are poorly executed or if environmental restrictions are not enforced. Stronger societal standards about environmental conservation can be fostered by government actions. Behaviour change can be prompted, for instance, by associating environmental stewardship with religious or national pride. Participating in neighbourhood initiatives like rainwater collection, sustainable farming, or replanting schemes may increase people's sense of control and give them a sense of having a real impact on the community. NGOs and grassroots groups may play a significant role in raising awareness of climate change and influencing people's attitudes and sense of control.

Positive attitudes towards climate action may be fostered by national awareness programs that draw attention to Pakistan's susceptibility to climate change and the advantages of sustainable practices. For example, tying the effects of climate change, such as drought or flooding, to actual repercussions can instill a feeling of urgency. By utilising Pakistan's cultural and religious values to support environmental conservation, robust societal norms around sustainability may be established. These actions can become more socially acceptable if local influencers, celebrities, and religious leaders are involved in promoting climate action. Increasing access to low-cost green technology can boost perceived behavioural control. Examples of these technologies include renewable energy sources and sustainable agricultural methods. Policies enacted by the government that provide subsidies, enhance

infrastructure, and establish opportunities for climate action would facilitate the adoption of climate-friendly practices by both people and communities.

The Theory of Planned Behaviour (TPB) provides important insights into why people in Pakistan either participate in or do not participate in behaviours that mitigate climate change. Organisations and politicians may create focused interventions to encourage climate-conscious behaviour by concentrating on important elements including attitude, subjective standards, and perceived behavioural control. To enable Pakistanis to take significant climate action, it is imperative to educate them, reinforce pro-environmental values via social influence, and enhance their perception of control by giving resources and infrastructure. This is especially important for Pakistan, as the effects of climate change are not just felt there, but also have a significant influence on the stability of society and the economy. In order to mobilise both individual and group actions to reduce climate risks and assure the nation's resilience against future climate problems, it will be imperative to address these psychological and social elements.

1.9 Organization of the study

There are five chapters in this research. The first chapter focuses on the introduction of the study and theoretical frame work of the study. The 2nd chapter will explain the causes and implication of the climate change. The 3rd chapter will be on policies and strategies taken by government of Pakistan. The 4th chapter focuses on sustainable development of Pakistan. The 5th chapter will provide the findings and conclusion of the study.

CHAPTER TWO

THE CAUSES AND IMPLICATION OF THE CLIMATE CHANGE

2.1 Climate Change

The average temperature of the Earth has risen by around 1 degree Fahrenheit throughout the course of the 20th century, according to NASA (Global Climate Change: Effects). Although it might not seem like a big difference, its impact on our environment has shown that it is. This little increase in temperature has a wide range of effects, including prolonged heat waves and drought seasons as well as more powerful storms. (Kaddo, 2016)Additionally, the rise in the planet's average temperature brought to a number of issues that permanently altered our ecosystem.

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Climate change has had far-reaching consequences on various aspects of our planet, with weather patterns being one of the most profoundly affected areas. Since 2002, there has been a noticeable uptick in the frequency and severity of extreme weather events. Burghila et al., in their article "Climate Change Effects - Where to Next?" (2007, p. 408), reported that the country experienced its most severe drought in six decades during 2007. The primary driver

of these changes is the escalating concentration of greenhouse gases in our atmosphere, a fact well-documented by NASA. The accumulation of greenhouse gases, such as carbon dioxide, methane, and nitrous oxide, traps heat within our atmosphere, leading to a rise in global temperatures. This increase in temperature, predominantly attributed to greenhouse gas emissions, has not only resulted in more prolonged and intense heatwaves but has also significantly amplified the power of hurricanes. One of the key mechanisms at play here is the warming of ocean waters due to the overall rise in global temperatures. As the Earth's surface temperature increases, so does the temperature of ocean waters. This warming effect has a direct impact on the intensity of tropical storms like hurricanes and tornadoes. Wuebbles, an expert in climate science, has highlighted this connection, emphasizing that a warmer atmosphere contains more energy, providing these storms with the fuel needed to intensify. In essence, climate change, driven by the accumulation of greenhouse gases, is causing a domino effect on our planet's weather systems. The consequences are evident in the form of more frequent and severe droughts, heatwaves, and increasingly violent hurricanes and tornadoes.(College, 2016) Addressing this issue is crucial to mitigating the adverse effects of climate change and preserving the stability of our planet's weather patterns.

2.2 Climate Change is Predominantly Attributed to Anthropogenic Factor

"Anthropogenic climate change" (anthropogenic, which means produced by humans) refers to these climatic changes as a result of human activity. Global warming, which is the gradual warming of the planet brought on by an unnatural (human-induced) increase in the greenhouse effect as greenhouse gas concentrations rise primarily as a result of burning fossil fuels (coal, oil, and natural gas), is one of the main factors contributing to anthropogenic

climate change. Let's quickly examine the greenhouse effect before looking at its contribution to climate change.

i. Vehicular Conveyance and Transit
ii. The Production of Electrical Energy
iii. Sectors of Industrial Activity and Production Processes.
iv. The Cultivation of Crops and Livestock Management.
v. The Exploration and Exploitation of Petroleum Resources
vi. The Widespread Clearing of Forested Areas.

It's (Turrentine, 2022)important to keep in mind that so-called "greenhouse gases" including water vapor, carbon dioxide, methane, and nitrous oxide absorb and emit infrared radiation, and that this process is referred to as the greenhouse effect.(sciences, 2012) If you recall from our research on energy budgets, the "down welling infrared" traces on our energy graphs, were caused by emissions from clouds and invisible greenhouse gases. The main contributors to the down welling infrared contributions in this particular graph, which was taken on a perfectly bright day on March 11, 2012, were greenhouse gases. The average temperature of the Earth would be almost 60 degrees Fahrenheit cooler if greenhouse gases weren't there. The heat that the greenhouse effect creates is necessary to support life as we know it on Earth and is a result of nature. However, since the Industrial Revolution in the late 1700s, people have been extensively using carbon-rich "fossil" fuels like coal, oil, and natural gas, emitting.

The diverse effects of climate change manifest themselves in various ways within historical climate data. By scrutinizing regional and seasonal climate patterns rather than fixating on a single global metric, such as the average surface temperature of the Earth, it

becomes more straightforward to discern these unique imprints. Observations of surface warming, alterations in atmospheric temperature, increases in ocean heat content, elevations in atmospheric moisture, sea-level rise, and the accelerated melting of both land and sea ice align cohesively with the anticipated outcomes of human activity on the climate. Our understanding of greenhouse gases' ability to trap heat and influence climatic changes is the basis for the agreement between observed changes and scientific forecasts. These results emphasise that the observed changes in our climate cannot be explained by natural processes alone. The notion that human activities are the primary drivers of modern (Science, 2020) climate change is supported by the complex interactions between greenhouse gases and the patterns they leave on the climate, as shown by meticulous fingerprint investigations.

2.3 The Natural Causes of Climate Change

To fully understand how human activity influences weather and climate internationally, it is important to look into the natural factors that contribute to global climate changes. In the lengthy geological history of Earth, there have been times when temperatures have been greater than they are now. One such example is the era of the dinosaurs, when it was obvious that there were no ice caps or sheets. However, there have also been colder periods in the past, including a few ice ages. This historical perspective highlights how climate fluctuations are an inherent component of Earth's dynamic system, whether they are caused by people or not.

The intricate relationships between many natural factors have a significant role in defining the climate of the planet. Numerous occurrences fall under this category of environmental influences, including changes in solar radiation, alterations to Earth's orbit, adjustments to oceanic cycles, and fluctuations in volcanic activity. Because solar radiation is our planet's

main energy source, fluctuations in solar radiation throughout time impact climatic patterns. Long-term climatic fluctuations are influenced by Milankovitch cycles,(Seman) which are oscillations in Earth's orbit. The El Niño and La Niña phenomena, which are oceanic cycles, have a significant influence on both regional and global climate trends. Furthermore, volcanic activity affects the short-term dynamics of the climate by releasing gases and particles into the atmosphere.Differentiating between the effects of anthropogenic activities and natural climatic variability requires an understanding of and capacity to discriminate between the influence of these natural phenomena. Although there have always been natural forces influencing Earth's climate, human activity has recently increased at an unprecedented rate and scale, especially with regard to the production of greenhouse gases, which has become a major factor in modern climate change. (Chapter 3. Natural and Anthropogenic Drivers of Climate Change)For this reason, a comprehensive grasp of both naturally occurring and man-made variables is necessary in order to effectively manage and mitigate the current issues brought about by climate change.

Geological evidence indicates that the Earth's climate has undergone various notable fluctuations, the majority of which have been brought about by natural processes including shifts in the sun, emissions from volcanoes, modifications to Earth's orbit, and variations in carbon dioxide (CO2) levels. In the past, the earth's climate changed gradually throughout aeons, sometimes even taking millions of years. Evolutionary patterns in geological records demonstrate the enduring nature of these changes. More recent research, however, indicates that the current climate is changing more quickly than that which has been documented in geological records, indicating that this historical average is not being followed.

Numerous intricate and diverse elements have contributed to these transformations. The variations in the sun's energy output, also known as solar variability, affect Earth's climate patterns. Because it releases gases and particles into the atmosphere, volcanic activity adds dynamic elements to the climate equation. Moreover, modifications to Earth's orbital parameters affect how solar radiation is distributed around the world and result in long-term climate changes. Moreover, changes in carbon dioxide concentrations a potent greenhouse gas have a big influence on the dynamics of Earth's overall climate. While the geological chronology attests to the inevitable ups and downs of climate change, the current state of affairs is marked by an unprecedented acceleration of the rate of change. Numerous intricate and diverse elements have contributed to these transformations. The variations in the sun's energy output, also known as solar variability, affect Earth's climate patterns. Because it releases gases and particles into the atmosphere, volcanic activity adds dynamic elements to the climate equation. Moreover, modifications to Earth's orbital parameters affect how solar radiation is distributed around the world and result in (survey) in long-term climate changes. Moreover, changes in carbon dioxide concentrations a potent greenhouse gas have a big influence on the dynamics of Earth's overall climate. Current research emphasises how critical it is to address the climate system's fast changes and raises the possibility that human factorsmore especially, rising greenhouse gas emissions may be at play.

2.4 Human versus Natural Causes

Carbon dioxide is clearly the most important human greenhouse gas. The amount of carbon dioxide in the atmosphere has increased significantly over time, rising from around 280 parts per million pre-industrial levels to 379 parts per million in 2005. According to ice core data, this increase is far higher than the normal range that has been seen over the previous 650,000 years, which generally varied from 180 to 300 ppm. In 2005, the amount of

carbon dioxide in the atmosphere deviated from historical standards to an unprecedented degree. The information gleaned from ice cores, a priceless geological record, sheds light on the long-term natural variations in carbon dioxide concentrations.The rate of increase in the concentration of carbon dioxide showed a significant acceleration during the previous ten years (1995–2005), averaging 1.9 parts per million annually. This increase exceeds the average annual growth rates of 1.4 ppm that have been seen since continuous direct atmospheric observations began in 1960 and ended in 2005. It is essential to acknowledge that, notwithstanding certain fluctuations in growth rates from year to year, the general pattern indicates a (Fahey, D.W., S.J. Doherty, K.A. Hibbard)faster rate of increase in the concentration of carbon dioxide. This phenomenahighlights the widespread effects of human activity as well as the pressing need to address the extraordinary alterations in the composition of the atmosphere. Based on the available data, there appears to be a significant divergence from past levels of carbon dioxide, which calls for a coordinated endeavor to understand and alleviate the effects of increased concentrations of greenhouse gases.

The use of fossil fuels is the main cause of the increased atmospheric concentration of carbon dioxide since pre-industrial times, with land-use change being another significant but relatively minor factor. The average annual fossil carbon dioxide emissions in the 1990s were 6.4 Gt between 2000 and 2005 (the statistics for 2004 and 2005 are preliminary estimates). The extensive use of fossil fuels, which has become increasingly noticeable over time, is the main factor contributing to the rise in carbon dioxide levels. One of the main causes of the observed increase is the massive amounts of carbon dioxide released into the atmosphere from the combustion of fossil fuels like coal, oil, and natural gas. Changes in land use, such as deforestation and changes in land cover, also contribute to this (Chapter 2: Our Changing Climate, 2017) phenomenon concurrently, but to a lesser extent. The shift in annual carbon

dioxide emissions that occurred between the 1990s and the start of the 2000s demonstrates the growing impact that human activity is having on Earth's carbon cycle. It emphasises how important it is to fully understand these human elements in order to create workable strategies for lessening the detrimental effects of rising carbon dioxide concentrations on the climate system. In order to encourage sustainable habits and lower the growing carbon emissions that are driving climate change, it is imperative to address both the utilisation of fossil fuels and changes in land use. From a pre-industrial level of around 715 parts per billion to 1732 parts per billion in the early 1990s and subsequently to 1774 parts per billion in 2005, methane concentrations in the atmosphere have grown dramatically over time.

According to ice core data, this rise is far more than the natural range that has been seen over the previous 650,000 years, with historical values ranging from 320 to 790 ppb. (IPCC)The highest level of methane concentration seen since the pre-industrial period denotes a departure from historical averages and highlights the unparalleled influence of human activity. The growth rates, albeit declining since the early 1990s, are consistent with roughly steady total emissions throughout this time period, which include emissions from both natural and human sources. The use of fossil fuels and agriculture appearing as the primary reasons of the observed rise in methane concentration, it is highly likely that human action is to blame. Ascertaining the exact contributions from various sources remains challenging.

Anthropogenic activities, especially those related to agriculture and the use of fossil fuels, are causing methane levels to rise. Methane emissions from cow digestion and rice farming are two of the main causes of the overall increase in methane emissions. Similarly, the mining, processing, and burning of fossil fuels (Climate change: Evidence and causes, 2020)

release methane into the atmosphere, increasing atmospheric concentrations. Even with continuous anthropogenic inputs, the decline in growth rates emphasises the complexity of methane dynamics and the need for a more thorough understanding of its sources. Enhanced efforts in source attribution are essential in the context of global climate change to address the challenges posed by elevated methane concentrations and to create practical mitigation strategies.

CHAPTER THREE

POLICIES AND STRATEGIES TAKEN BY GOVERNMENT OF PAKISTAN

Undoubtedly, climate change is a grave concern that is negatively impacting every country, including Pakistan. Pakistan developed and implemented the National Climate Change Policy (NCCP) in 2012 as a proactive measure to tackle this issue. Notwithstanding these initial efforts, there is a growing consensus that further analysis and investigation are needed to fortify the nation's defences against this enduring threat. It is important to carry out thorough assessments to identify any interventions that are either unidentified or ignored within the existing policy framework. To assess the efficacy and relevance of the present policy measures in light of the evolving environmental concerns, more study is also necessary. Moreover, it is critical to give the effective implementation of the NCCP a priority across all governmental levels (Salik) and spheres of influence. To further explain, ongoing evaluations and studies may help pinpoint any policy vulnerabilities or areas that want change. This may mean conducting in-depth evaluations of Pakistan's current climate change

impacts, evaluating the effectiveness of existing adaptation and mitigation strategies, and getting input from a range of stakeholders, including the local populace, scientists, and policymakers.

In addition to facilitating information sharing, capacity building, and resource mobilisation, strong local and international ties would help boost Pakistan's resistance to climate change. Collaborating on global initiatives such as the Paris Agreement might provide valuable models and motivation for aligning domestic policies with worldwide climate objectives. With the establishment and execution of the NCCP, Pakistan has achieved significant progress in its response to climate change; (Andrew Jordan, 2008) nevertheless, continued focus and action are required to address this complex and ever-changing challenge. Pakistan may strengthen its ability to lessen the consequences of climate change and build a more sustainable future for its people via thorough study, legislative efforts, and collaboration.

Climate change policies are tangible efforts to lessen the intricate consequences of global warming. Since climate change is a relatively new topic of public policy, (Mumtaz, 2018) global countries must take the lead. Many countries have either already enacted climate policies or are in the process of doing so in order to mitigate the adverse effects of global warming. However, thorough evaluations including close inspection and analysis are necessary to ascertain the feasibility and efficacy of these programs.

To clarify, evaluating the effectiveness of climate policies involves looking at a variety of aspects, such as how well they can mobilise (Yousaf, 2011) resources and popular support. When assessing these policies' practicability, it's also important to take into account how well-suited they are to the present socioeconomic climate and how much of an impact they

will have on consumer and business behaviour. Incorporating stakeholder input into the evaluation process is crucial to ensure that diverse perspectives are duly considered and incorporated into policy assessments. To get insight into the real-world implications and repercussions of climate policies, this may involve talking to scientists, policymakers, corporate leaders, environmentalists, and locals. Furthermore, comparative studies may provide useful knowledge by contrasting the experiences of other countries in implementing climate policy. By scrutinising successful strategies and drawing lessons from previous errors, policymakers may enhance present approaches and devise innovative solutions for emerging issue.

Pakistan's geographic location places it in a region that is particularly vulnerable to the impacts of climate change. South Asian nation of Pakistan features barren deserts in the south and mountainous regions in the north due to its diverse climate. Pakistan's diverse geography makes it especially susceptible to changes in weather patterns and environmental conditions. One of Pakistan's main concerns is the increasing frequency and intensity of extreme weather events including heatwaves, droughts, and floods.

These events not only directly endanger human life and infrastructure, but they also have long-term consequences for agriculture, water resources, and overall economic stability. Pakistan's agriculture sector, which is the backbone of the nation's economy and employs millions of people, is particularly vulnerable to climate change. Prolonged droughts, erratic rainfall patterns, and water scarcity have disrupted agricultural productivity, leading to food insecurity and financial challenges for farmers. Moreover, Pakistan's primary water supply comes from the melting of glaciers in the Himalayan and Karakoram ranges, which is jeopardised by global warming. Apart from its impact on domestic and agricultural water

supplies, the fast thawing of glaciers increases the likelihood of glacial lake outburst floods (GLOFs) in hilly regions.

Climate change exacerbates socioeconomic inequities and vulnerabilities within Pakistani society, in addition to environmental and economic difficulties. Marginalized communities, such as women, indigenous groups, and rural people, are frequently the ones most affected by climate-related disasters and have less access to resources and support networks to help them deal with and adjust to these changes.

Pakistan has addressed these issues by putting policies and initiatives into place that emphasise climate change adaptation, mitigation, and resilience-building. However, to properly address (Hickey & Aftab, March 2010) the complex implications of climate change on Pakistan's environment, economy, and society, there is an urgent need for increased awareness, money, and coordinated action at the national and international levels.

With the implementation of its first climate change policy in 2012, Pakistan achieved a huge progress in confronting the difficulties created by climate change. The development of the National Climate Change Policy (NCCP) was a watershed moment in the country's commitment to minimising and mitigating the consequences of climate change. This plan is a comprehensive framework that contains more than 120 separate policies targeted at tackling different aspects of climate change in varied businesses. The NCCP stands out for its multi-sectoral approach, which highlights the interconnection of the consequences of climate change on many domains. It outlines strategies for both adaptation and mitigation, highlighting the need for concerted actions to reduce greenhouse gas emissions and strengthen the resistance to climate change. The plan aims to address the vast range of challenges brought about by climate change in Pakistan's socioeconomic fabric by focussing

on critical areas such as agriculture, transportation, human health, energy, forestry, and disaster preparedness.

One of the main tenets of the NCCP is its emphasis on informing stakeholders about the seriousness and consequences of climate change. The plan emphasises outreach and education programs to foster a culture of sustainability and climate resilience, realising that informed and engaged individuals are essential to enacting meaningful change. The NCCP also highlights how important it is to transfer technology and develop Pakistan's capability in order to provide it the tools and knowledge it needs to effectively combat climate change. The policy builds institutional capacity, promotes technology transfer, and makes investments in research and innovation to empower stakeholders at all levels to respond to climate change proactively. Structural strengthening is another essential element of the NCCP; it recognises that effective planning and execution of climate action depend on robust governance frameworks. Through institutional adjustments and capacity-building initiatives, the strategy aims to provide a cogent and integrated approach to managing climate change by enhancing cooperation between government agencies, civil society organisations, and other stakeholders.

The National Climate Change Policy (NCCP) of Pakistan is a commendable effort to address the various challenges posed by climate change. One notable aspect that the NCCP draws attention to is the encouragement of both regional and global cooperation as a way to leverage the benefits of global financial processes and the emergence of a variety of financial institutions. Pakistan's commitment to tackle climate change holistically is evident in its awareness of the necessity of global collaboration. Pakistan is one of the developing countries with a comprehensive policy on climate change, demonstrating its proactive attitude to

tackling this pressing issue. While the establishment of the NCCP is a positive step, a thorough study is still necessary before it can be put into practice. Although the NCCP is important, not much has been studied about it, especially outside of academia. This underlines the importance for rigorous inspection and verification.

To make the NCCP better and more efficient, it must be made aware of its flaws. One significant flaw that has been identified is the limited involvement of important stakeholders in the development and implementation of the plan, which creates barriers to its successful execution. This highlights how important it is to include a range of stakeholders in the policymaking process, including government organisations, civil society organisations, and local communities, to ensure ownership and inclusion.

In addition, a focused effort is needed to evaluate the NCCP's benefits and drawbacks due to the dearth of thorough research on the subject. Comprehensive assessments can help identify and rectify parts of the policy that have been overlooked or incorrectly recommended. Establishing the groundwork for successful policy implementation and fostering resilience to the consequences of climate change require this thorough analytical approach.

Additionally, the outcomes of these investigations may offer significant fresh data for revising the NCCP and directing the development of regional climate policies and future climate change action plans in Pakistan. These studies provide a solid framework for the creation of evidence-based strategies for national and subnational mitigation of climate change. Finding opportunities for improvement, highlighting the NCCP's advantages, and critically analysing its contents are the goals of analysis. Pakistan may improve its climate

change policy framework, increase its resilience to climate impacts, and support international efforts by conducting thorough evaluations and engaging stakeholders.

Vulnerability to water resources results from differences in the expected supply and the present and predicted demand for water. Population growth and sectoral demands are closely related to this demand, whereas the supply is distinguished by both quantitative and qualitative factors. Droughts, floods, and seasonal imbalances all increase vulnerability. One major area of worry is the Indus Basin system's water potential, which is critical to Pakistan's agriculture and other sectors, such as (Mirza, 2020)energy, industry, household consumption, and coastal fisheries. But this basin's water potential is naturally constrained. The average water availability at Pakistani rim stations entering the Indus Basin over 64 years is around 146 million-acre feet (MAF). Even with these efforts, crops only use roughly 31 MAF efficiently when losses in the field applications, watercourses, and canal system are taken into consideration. Even while the rate of loss seems great, a large amount of this loss goes toward replenishing groundwater, which reduces the amount of space available for seepage management. Approximately 41 MAF of the projected 46 MAF yearly recharge are now being used for agriculture production. Nonetheless, there is still a median value of about 10 MAF of untapped groundwater remaining. Building additional storage facilities for surface water has taken center stage in the present policy planning and discussion. But this is a contentious topic; political issues (Khan S. R.)center on fair water distribution, while social and environmental concerns address the relocation. The case for building additional dams is weaker in spite of the fact that floods have become more frequent and do more damage than they did twenty years ago. For example, since its completion, sedimentation has caused Tarbela Dam t43o lose over 30% of its storage capacity. However, alternatives like desilting Tarbela provide more economical options that produce comparable results in terms of energy

output and more water. Water supply projections include for an extra 6 MAF of storage capacity coming online in 2010 in accordance with policy aim. Generating demand scenarios is still difficult, though, particularly in light of climate change. The least advantageous supply scenario in which rising temperatures are accompanied by falling precipitation is taken into account.

Pakistan's approach to climate change adaptation, including a detailed evaluation of the government's programmes and policies. The efficiency of these approaches is assessed in the paper, taking into account aspects like scalability, practicality, and conformity with scientific recommendations. Notwithstanding the plan's positive qualities, there are significant implementation hurdles, such as problems with institutional capacity, financing limitations, and governance. The essay emphasises the value of community involvement in attempts to adapt to climate change, stressing the significance of social mobilisation and local knowledge. In order to assess success and make necessary strategy adjustments, it also emphasises the necessity of having strong monitoring and evaluation processes. The paper also looks at Pakistan's interactions with other countries and how adapting to climate change may affect vulnerable communities. It concludes by arguing in favour of a climate (Ebrahim, 22 November 2023)justice approach that puts social justice, equity, and human rights first. All things considered, the piece gives readers a thorough grasp of Pakistan's attempts to adapt to climate change and promotes critical thought about the possible advantages and drawbacks of these efforts.

CHAPTER FOUR

Sustainable Development in Pakistan: Integrating Non-Traditional Security Challenges

Pakistan's strategies and policies for sustainable development have evolved to include a focus on not only traditional concerns like economic growth and environmental conservation but also on addressing non-traditional security threats. These non-traditional threats—such as climate change, water scarcity, energy insecurity, health pandemics, and cybersecurity risks—are critical factors influencing the country's development prospects and long-term

stability. While Pakistan has made strides in formulating policies aimed at achieving sustainable development, the impact of these non-traditional security challenges requires integrated, adaptive approaches that go beyond conventional security strategies.Climate Change stands as one of the most pressing non-traditional security threats to Pakistan. The country is highly vulnerable to climate-induced disasters, such as floods, droughts, and extreme heat waves, which have had devastating effects on agriculture, infrastructure, and livelihoods. This directly impacts food security, disrupts economic activities, and forces large-scale migration from rural areas, further straining urban centers. In response, Pakistan has adopted several measures, such as the National Climate Change Policy, aimed at mitigating the impacts of climate change and improving resilience through initiatives like tree plantation programs, afforestation, and the promotion of renewable energy sources like solar and wind.

Water Scarcity is another major concern, exacerbated by climate change, population growth, and poor water management practices. Pakistan is facing a significant water crisis, with many of its rivers drying up and groundwater levels depleting rapidly. This scarcity threatens the agriculture sector, which is heavily reliant on irrigation, and is a growing concern for public health. The government has launched several projects, such as the construction of dams (e.g., Diamer-Bhasha Dam) and the implementation of Integrated Water Resource Management (IWRM), to address water shortages. However, these efforts face challenges related to financing, political instability, and limited technical capacity.

Energy Insecurity also undermines sustainable development. Pakistan's energy sector is heavily reliant on imported fossil fuels, which is both costly and unsustainable. Inadequate

infrastructure, inefficient power distribution, and a growing energy demand further complicate the situation. The government has made efforts to promote renewable energy, with a focus on wind and solar power, and has also initiated energy efficiency programs. However, these efforts have been slow to scale up, and energy shortages continue to hinder industrial and economic growth.

Health Pandemics*such as the COVID-19 crisis have underscored the importance of strengthening public health systems. The pandemic not only put enormous pressure on the healthcare system but also exacerbated socioeconomic inequalities, disproportionately affecting vulnerable populations. Pakistan's National Health Policy focuses on improving healthcare infrastructure, expanding access to services, and addressing issues such as malnutrition, but the pandemic revealed the need for stronger preparedness for future health emergencies.

Cybersecurityhas emerged as a growing threat, especially with the increasing reliance on digital technologies for governance, commerce, and national security. Cyberattacks targeting critical infrastructure and financial institutions have the potential to disrupt economic activity and undermine public confidence. In response, Pakistan has developed a National Cyber Security Policy to enhance the country's cyber resilience and safeguard sensitive information from malicious actors.

Pakistan's sustainable development policies are designed to tackle these non-traditional security threats while promoting long-term economic growth and social well-being. The *National Environmental Policy* (NEP) aims to address climate change, environmental degradation, and pollution, while the *Green Growth Initiative* seeks to promote

environmentally sustainable development through investments in green technologies, renewable energy, and sustainable agriculture.

In line with global efforts to achieve the *Sustainable Development Goals (SDGs), Pakistan has aligned its national policies to address climate change, reduce poverty, promote gender equality, and ensure social inclusion. The **Pakistan Vision 2025* serves as a roadmap for inclusive development, focusing on fostering innovation, enhancing human capital, and improving economic productivity while addressing environmental challenges. This includes promoting urban sustainability, the development of public transportation systems, and creating green spaces in cities.

Despite these policy frameworks, Pakistan faces several challenges in fully implementing sustainable development strategies. One significant hurdle is the *resource constraint, as the country struggles to allocate sufficient funds to address both environmental issues and social development priorities. Political instabilityand frequent changes in government have also resulted in inconsistency in policy execution, often leading to delays and disruptions in key projects.

Moreover, institutional weaknesses*in governance, a lack of coordination between federal and provincial bodies, and inefficiency in policy implementation hinder progress. The bureaucratic structure and corruption are additional factors that contribute to the slow pace of development, especially in the face of urgent non-traditional security threats.

Internationally, Pakistan also faces challenges in securing cooperation and financing for large-scale projects, particularly related to climate change mitigation and adaptation. While Pakistan is a signatory to global agreements such as the Paris Agreement, it struggles to

mobilize international support due to competing global priorities and its own limited capacity to implement complex international frameworks.

To better address non-traditional security threats, Pakistan must take a more integrated approachto development, linking environmental sustainability with security concerns. First, the government should further strengthen climate change adaptation measures by enhancing disaster preparedness and resilience in vulnerable communities. Efforts such as *water conservation* and improving agricultural techniques that use water more efficiently should be prioritized to address the looming water crisis. Additionally, Pakistan needs to scale up its investments in renewable energy to reduce reliance on imported fuels, ensuring energy security and promoting clean energy growth.

Finally, a more holistic approach to public engagement is necessary. Educating the public on sustainable practices, climate change, and health risks will foster greater community involvement in addressing these challenges. Informed and engaged citizens can contribute to grassroots-level solutions and support policies that promote sustainability. Pakistan's sustainable development efforts must evolve to meet the challenges posed by non-traditional security threats, which are intertwined with economic, environmental, and social factors. While the government has made progress in addressing these threats through various policies, significant barriers remain. Overcoming these obstacles will require better policy integration, stronger governance, international cooperation, and enhanced public awareness. Only by addressing both traditional and non-traditional security threats comprehensively can Pakistan ensure a sustainable, secure, and prosperous future for its population.Sustainable development combines solving human society's socioeconomic problems with the

requirement to maintain the natural systems' carrying capacity. The term "sustainable development" has several different meanings. For example, the United Nations Brundtland Commission (1987) defined it as the capacity to fulfil current demands without jeopardising the ability of future generations to fulfil their own. Sustainable development, according to Todaro and Smith (2006), is defined as a growth pattern that permits future generations to live at least as well as the present generation. In this sense, the term "sustenance" refers to the essential products and serviceslike food, clothes, and shelter—that are required to preserve a minimal level of life. When environmentalists use the word "sustainability," they mean that current generations' demands must be met without endangering the capacity of future generations to fulfil their own.

A development trajectory is deemed sustainable from an economic standpoint if the total stock of capital assets either stays the same or rises with time. The state of the ecosystem will essentially determine future development and general well-being. Air, water, and land are examples of natural resources that are vital assets that are a shared legacy for all future generations. Future generations will suffer if these resources are carelessly depleted in the sake of expedient economic goals. Planners must thus use environmental accounting in some way when making policy decisions. A long-term, strategic strategy is needed to address the complex issues surrounding energy, environmental sustainability, and sustainable development in general. The significance of today's energy concerns is especially apparent, and although discussions about other energy sources persist, nuclear energy stands out as a crucial aspect of an all-encompassing and efficient sustainable energy system. Research endeavours are progressively focused on enhancing the effectiveness of energy resource allocation and mitigating ecological discharges. Prioritising technologies like utility-scale cogeneration and the role of nuclear energy in this context is essential for promoting

sustainable development. Enhancing sustainability has showed promise in utility-scale cogeneration, which produces useable heat and electricity concurrently from a single energy source. In particular, Ontario's cogeneration system installation has shown promise for significant economic and environmental advantages. Ontario might achieve a significant decrease in the yearly and cumulative use of fossil fuels and uranium by incorporating such technologies. Lower related emissions result from this decrease, which is crucial for lessening the negative environmental effects of energy production.

Utility-based cogeneration also has a lot of financial benefits. The province and its electrical utilities profit monetarily from the increased efficiency of energy generation and delivery. Adoption of cogeneration also makes the switch from fossil fuels to nuclear energy easier. This change promotes more general objectives of lowering greenhouse gas emissions and reliance on non-renewable resources in addition to helping to more sustainably(Sardar Javaid Iqbal Khan, 03 July, 2013) satisfy energy demands. Utility-based cogeneration and nuclear energy strategically used can help Ontario achieve its sustainability goals by fostering the shift to a more sustainable energy future and delivering benefits to the environment and economy.

Athorough examination of the intricate relationship between climate change and sustainable development. The notion of sustainable development is a developmental strategy that aims to strike a balance between the requirements of the present generation and the need to protect the environment and natural resources for future generations. Three fundamental pillars are integrated in this concept: social equality, economic viability, and environmental integrity. In order to maintain environmental integrity, natural resources must be managed sustainably to avoid depletion and damage. The primary objective of economic viability is to

promote long-term economic growth and stability without posing a threat to the environment. Social equality ensures that development advantages are distributed fairly and resolves disparities, therefore improving everyone's level of living.

Sustainable development within the framework of global initiatives, particularly the United Nations Sustainable Development Goals (SDGs). Planning and policy-making processes must incorporate social, economic, and environmental considerations into their integrated approach in order to successfully address urgent global challenges such as poverty, inequality, and climate change. Applying sustainable development effectively requires tailoring these concepts to local conditions, resources, and needs. It means integrating sustainability considerations into national and local policies, as well as sectoral development programs in the areas of energy, agriculture, and urban planning.

The phenomenon's scientific underpinnings when discussing climate change. They explain the greenhouse effect, which is caused by gases like as carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2 O) trapping heat in the Earth's atmosphere. Global warming results from this. Climate models are utilised to predict future weather conditions based on different scenarios for greenhouse gas emissions. These models are crucial for understanding potential consequences and directing the creation of policy.

There are many different and wide-ranging repercussions of climate change. The authors go into great detail on the effects on the ecosystem, including how rising global temperatures lead to more frequent and intense heatwaves and how melting polar ice and glaciers contribute to rising sea levels. These modifications have a significant effect on coastal regions and ecosystems. Climate change disrupts biodiversity in addition to causing shifts in species distributions, habitat loss, and extinction. The socio-economic implications are

particularly significant since they affect agricultural productivity and put food security at risk due to altered precipitation and temperature patterns. Public health is impacted by rising temperatures and changing disease patterns, which result in an increase in vector-borne diseases and heat-related disorders. The economy may suffer from extreme weather events and changing climate conditions, which might also lead to infrastructure degradation and higher adaptation and mitigation costs.

Several strategies are used by policy to address these problems. Mitigation strategies, such as converting to renewable energy sources, increasing energy efficiency, and putting carbon capture and storage technologies into practice, are necessary to reduce greenhouse gas emissions. Afforestation and reforestation are examples of sustainable land use techniques that are advocated in order to store carbon and improve ecosystem resilience. The primary objective of adaptation strategies, which are equally important, is to build community resilience and infrastructure to withstand the consequences of climate change. This calls for increased disaster preparedness, investment in resilient infrastructure to survive extreme weather events and shifting climatic conditions.

To tackle global warming within the broader framework of sustainable development. A comprehensive plan ensures that actions taken to reduce greenhouse gas emissions and adjust to the effects of climate change support long-term sustainability goals. They emphasise that policy related to climate change should support and enhance sustainable development objectives in order to successfully address environmental, economic, and social challenges simultaneously. International agreements have a big impact on how climate policy is formed. The Kyoto Protocol, which established legally binding goals for industrialised nations to cut their greenhouse gas emissions, and the Paris Agreement, which establishes a global

framework for climate action with commitments from all countries to restrict temperature increase and enhance climate resilience. These accords emphasise the value of international collaboration while acknowledging the necessity of local initiatives to meet sustainability and climate change objectives.

The thorough analysis of the ideas, problems, and solutions pertaining to climate change and sustainable development. It shows how different fields interact and how well-thought-out strategies may result in practical answers. The active participation from a range of stakeholders, technology advancement, and ongoing research to address climate-related issues and advance a sustainable future. It draws attention to how sustainable development (Mohan Munasinghe, March 3, 2005) and climate change mitigation are mutually reinforcing, and it advocates for a unified strategy that unites international efforts, policy, and practice in order to produce significant and long-lasting results.

4.1 Goals : The Sustainable Development

A more sustainable, just, and affluent society is what the Sustainable Development Goals (SDGs) aspire to bring about by 2030. The Sustainable Development Goals (SDGs) are a set of 17 objectives that were introduced by the UN in 2015 as a component of the 2030 Agenda for Sustainable Development. These objectives target the most urgent global issues, such as poverty, inequality, climate change, environmental degradation, peace, and justice. Because these objectives are universal, they hold true for all nations, regardless of their degree of development. The SDGs are an extension of the previous Millennium Development Goals (MDGs), with an emphasis on environmental sustainability, social inclusion, and economic progress.

The Sustainable Development Goals (SDGs) were formally recognised as the national development objectives of Pakistan by the Parliament in February 2016. The Ministry of Planning has previously included the SDGs into its development framework long in advance of the official signing in September 2015, even before its official support. These objectives were then included in Pakistan Vision 2025.

The Ministry of Planning, Development, and Reform created a coordination structure in response to this in order to coordinate activities amongst the federating units. The goal of this framework is to guarantee that the SDGs are implemented in a coordinated and coherent manner at the national and regional levels. The third pillar's goals, which centre on reducing the consequences of climate change, require significant institutional changes in addition to long-term efforts. Both long-term, strategic work and major institutional adjustments will be necessary to achieve the necessary achievements in this area. To do this, policies that lessen the consequences of climate change must be developed and implemented, ecosystems and communities must be made more resilient, and climate considerations must be included into all planning and development procedures. Pakistan aims to address the intricate matters associated with climate change and sustainable development by integrating these goals into national efforts and promoting collaboration amongst many stakeholders.

4.2 Essential Goals of the SDGs:

1. Remove all types of poverty worldwide.
2. Provide food security, enhance nutrition, eradicate hunger, and advance sustainable agriculture.
3. Good Health and Well-Being:
4. Make sure that everyone is healthy and encourage well-being at all ages.

5. Quality Education: Ensure inclusive and equitable quality education while fostering opportunities for lifelong learning.
6. Gender Equality: Attain gender parity and provide all women and girls with equal power.Clean Water and Sanitation: Ensure that water and sanitation are available and managed sustainably.
7. Make sure that everyone has access to modern, affordable, dependable, sustainable, and sustainable energy.
8. Encourage fair labor practices, full and productive job opportunities, and steady, inclusive economic growth.
9. Create a robust infrastructure, encourage sustainable and inclusive industrialization, and support innovation.
10. lessen inequality both inside and across nations.
11. Make human settlements and cities robust, safe, sustainable, and inclusive.
12. Assure patterns of production and consumption that are sustainable.
13. Act quickly to mitigate the effects of climate change.
14. Seas, oceans, and marine resources should all be preserved and used responsibly.
15. Forests, biodiversity, and terrestrial ecosystems should all be preserved, restored, and used sustainably.
16. Encourage inclusive, peaceful societies, make justice accessible, and create efficient, responsible institutions.
17. To implementation strategies and rekindle international collaborations for sustainable development.

As efforts in one area may affect results in other areas, the SDGs emphasize that sustainable growth requires balancing the financial, social, and environmental elements. To achieve these objectives, cooperation between corporations, governments, civil society organizations, and people is essential. Long-term changes in temperature and weather patterns are referred to as climate change, and they are mostly brought about by human activity including the burning of fossil fuels, deforestation, and manufacturing processes. Large volumes of greenhouse gases are released into the atmosphere as a result of these activities, which trap heat and cause global warming. Rising sea levels, greater intensity and frequency of extreme weather events, ecological upheaval, and challenges to biodiversity are all effects of climate change. Global collaboration, switching to renewable energy, cutting emissions, and preparing for the inevitable effects are all necessary to combat climate change.

4.3 Goal 13: The Sustainable Development

The thirteenth aim is to enhance resilience and adaptability to climate-related hazards and natural disasters. The goal of climate action is to counteract climate change and its effects as soon as possible. It places a strong emphasis on increasing awareness and enhancing climate education, as well as strengthening resistance to climate-related dangers and incorporating climate measures into national policy. The objective also emphasizes the necessity of financial assistance for developing nations to help them cut emissions and prepare for climate change. To do this and ensure a sustainable future, international collaboration is essential, particularly through agreements like the Paris Agreement.

Target 13.1: The quantity of countries with national and local plans in place to reduce the risk of disasters. To increase resilience and adaptive ability in the face of

climate-related hazards and natural disasters, governments must create and execute disaster risk reduction (DRR) policies at both the national and local levels.

Pakistan, for instance, has put in place measures for disaster risk reduction that function both at the federal and local levels. These plans will only work if they are carefully implemented and updated on a regular basis to take new risks and difficulties into account.

Target 13.2: Incorporate climate change measures into national planning, strategies, and policies. It is anticipated that nations would integrate climate change into their national planning frameworks, plans, and policies. Formal communications including national adaptation plans, nationally defined contributions, national communications, and biannual update reports should all represent this integration. The National Climate Change Policy (2012) of Pakistan, for example, provides a comprehensive set of initiatives designed to improve climate resilience and adaptation capability. Fostering resilience and supporting low greenhouse gas emissions development without sacrificing food security requires making sure this strategy is implemented effectively and updated as needed at the national and sub-national levels.

Target 13.3: Enhance Climate Change Education, Awareness-Raising, and Human and Institutional Capacity. It is imperative that elementary, secondary, and university curriculum incorporate mitigation, adaptation, impact reduction, and early warning systems related to climate change. The goal of this educational strategy is to increase awareness and provide people with the information they need to successfully solve climate-related issues.

Target 13.3.2: Adaptation, mitigation, and technology transfer programs related to climate change must be implemented with the support of strengthened institutional,

systemic, and human capacity. Building institutional and human resources ensures that interested parties are prepared to tackle climate-related issues and put innovative ideas into practice.

Goals and Indicators for the National Sustainable Development Goals (SDGs): Incorporate Climate Change Combative Measures: Adapt national planning frameworks, programs, and policies to the effects of climate change. Managing the Impact of Climate Change: To effectively manage the effects of climate change, provide institutional and policy support.

Optimise Water Use in Agriculture: To improve the efficiency of water use in agriculture, review and modify cropping patterns. Boost Capability bolster institutional and human resources for early warning, impact reduction, adaptation, and mitigation of climate change. Apply the 2017 Pakistan Climate Change Act: Ascertain compliance with the legislative and regulatory structures introduced by the Pakistan Climate Change Act of 2017. Raise Awareness: Educate the public and institutional leaders on the effects of climate change.

A multifaceted strategy is needed to achieve Goal 13, including the creation of effective plans for disaster risk reduction, the incorporation of climate change mitigation measures into national policy, and major initiatives in the areas of education and capacity building. Together, these efforts strengthen adaptive ability, improve resilience, and successfully mitigate the effects of climate change.

4.4 The Sustainable Development Goal 15

Target 15: Safeguard, Restore, and Encourage Sustainable Utilisation of Terrestrial Ecosystems. Protecting terrestrial ecosystems, managing forests sustainably, preventing

desertification, and stopping and reversing land degradation and biodiversity loss are the objectives of this goal.

Target 15.1: Make sure that inland and terrestrial freshwater habitats, as well as the services they provide, are conserved, restored, and used sustainably by 2020. In accordance with international accords, this entails putting an emphasis on forests, wetlands, mountains, and drylands. The percentage of significant sites for freshwater and terrestrial biodiversity that are covered by protected areas, as well as the amount of land that is forest as a percentage of the overall land area, will be used to determine how well this aim is being implemented.

Target 15.2: Increase global afforestation and reforestation efforts dramatically by 2020, put an end to deforestation, repair damaged forests, and promote sustainable management of all kinds of forests. The evaluation of this target's progress will be based on developments in sustainable forest management techniques. By 2030, afforestation and reforestation must increase by 50% in order to meet this aim, which also calls for stopping deforestation and rehabilitating damaged forests.

Target 15.3: Prevent desertification by 2030, repair damaged land and soil, particularly regions impacted by drought, floods, and desertification, and work towards a world free of land degradation. The percentage of degraded land compared to the overall land area will be used to gauge progress towards this goal.

To develop and implement strategies to stop deforestation and repair damaged forests, policy supportthat is, deforestation and forest restorationwas needed. Furthermore, put plans into action to greatly expand worldwide afforestation and reforestation initiatives. Integrating

ecosystems and biodiversity values into local and national planning and development processes is known as ecosystem integration. A crucial element of methods for reducing poverty should be this integration, which guarantees that ecological factors are incorporated into socioeconomic planning and policy-making.

In order to preserve ecosystem services and biodiversity, terrestrial ecosystems must be effectively conserved and restored. This means preserving important ecosystems, restoring harmed landscapes, and ensuring that sustainable management practices achieve a balance between ecological health and human needs. Sustainable forest management practices are essential to maintaining forest ecosystems and the advantages they offer. This means passing legislation to encourage moral forestry, put an end to illegal logging, and ensure that forest resources are used responsibly and without posing a threat to the environment. Fighting it is severely hampered by desertification and land degradation, particularly in arid and semi-arid regions. Integrated measures, such as sustainable land use practices, water management, and soil conservation, are required to solve these issues and maintain and expand land output. Increased forest cover through afforestation (planting trees on previously unforested land) and reforestation (replanting trees in deforested regions) aids in carbon sequestration, biodiversity enhancement, and soil and water quality improvement. Integrating ecosystem and biodiversity values into development and poverty-reduction plans ensures that environmental sustainability is prioritised alongside (Pakistan, MARCH, 2018)economic progress. This method promotes long-term ecological health and resilience, which are critical to human well-being and development. Goal 15 emphasises the importance of comprehensive policies to maintain and restore terrestrial ecosystems, manage forests sustainably, and combat land degradation and desertification. Achieving these goals requires coordinated

efforts at the national and global levels, as well as effective legislation and the incorporation of ecological values into development planning.

4.5 Pakistan's Agenda for Sustainable Development

Pakistan is the nation that emits the most greenhouse gases, accounting for 51% of total emissions from the energy sector. The agricultural and livestock sectors come in second with a combined 39% contribution. The combined emissions of these industries make over 90% of Pakistan's total emissions. Rapid urbanisation and population growth are damaging the country's natural ecosystems, and the quality of the air and water is deteriorating. The overuse of ecosystems, which poses serious challenges to the sustainability of the economy and the environment, is also shown by the reduction in biodiversity.

Between 2000 and 2005, the average rate of deforestation was 2.1% due to inadequate governance efforts to curb the practice. While the rate of land degradation has accelerated over the past 10 years, the amount of forest cover has remained consistent. The restoration of nine irrigated plantation areas, the amendment of the Forest Act 1927 to allow the private sector to establish businesses for accelerating afforestation, and the implementation of the "Reducing Emission from Deforestation and Forest Degradation (REDD+) preparedness" project are just a few of the developments that have resulted in the improvement of the country's environmental and climate governance framework between 2013 and 2018.

Pakistan signed the Paris Agreement and accepted the Doha Amendment to the Kyoto Protocol in 2016. Pakistan's Ministry of Climate Change (MoCC) revised both the National Climate Change Policy of 2012 and the Framework for the Implementation of the Climate Change Policy of 2014 to bring them into line with international responsibilities.

Together with 380 short-term, 108 medium-term, and 5 long-term activities, the Framework includes approximately 700 recommended actions, of which over 240 are prioritised. Pakistan, a country prone to natural disasters like flash floods, has established federal, provincial, and municipal disaster management organisations. They organise, coordinate, and direct operations related to catastrophe management. They provide the technological know-how to assess risks, lessen the chance of catastrophes, manage their consequences, and increase disaster awareness among the general population. As demonstrated by UN Sustainable Development Programme for Pakistan 2018–2022, Outcome 6 (Resilience) highlights the importance of disaster risk reduction (DRR) and disaster risk management (DRM) in Pakistani cooperation with the UN. Pakistan amended the Biodiversity Action Plan for 2000 in 2016 and established the National Forest Policy with the goal of protecting and preserving the country's foundational natural resources. The Billion Tree Tsunami Afforestation Project was started in 2014 as a solution to the deforestation issue. Its objective was to replenish 350,000 hectares of degraded woods by planting trees on 40% of the land and letting the remaining 60% regenerate naturally. After achieving its goals in August 2017, many months ahead of schedule, Pakistan became the first nation to commit to the Bonn Challenge, surpassing its 348,400-acre commitment. The program has built over 13,000 private tree nurseries in Khyber Pakhtunkhwa province, safeguarding the environment, raising local incomes, generating thousands of jobs, and empowering women and young people.

Following the success of the "Billion Tree Tsunami" initiative in the province of Khyber Pakhtunkhwa, the present administration launched the "Clean and Green Pakistan" campaign. The effort aims to eradicate pollution in Pakistan and fight climate change. As part of the current government's effort to restore the environment as part of the UN Decade of Eco-

System Restoration (2020–2030), local communities will be involved in the campaign, provincial focal points will be included, a fully resourced WASH Strategic and Reforms Unit will be established, and there will be frequent strategic discussions with many stakeholders. Following the success of the "Billion Tree Tsunami" project in the province of Khyber Pakhtunkhwa, the government launched the "Clean and Green Pakistan" initiative. The effort aims to eradicate pollution(Pakistan's Implementation of the 2030 , 2019) in Pakistan and fight climate change. The campaign will engage local communities in addition to provincial focal points, the establishment of a WASH Strategic and Reforms Unit with full resources, and regular strategic discussions with different stakeholders. Resurrected to provide strategic direction for the implementation of the 10 Billion Tree Tsunami Programme, which aims to involve all relevant parties in the future, is the Federal Forestry Board of Pakistan.

Pakistan is committed to developing a "green economy" and a low-carbon trajectory. Plans for adaptation and mitigation are included in the 2017 Climate Change Policy to enhance existing concerns and take on new ones. In an attempt to fulfil the three main objectives of the concept natural resource conservation, ecosystem and biodiversity preservation, and climate change adaptation and mitigation Pakistan incorporates all three aspects of sustainable development into its development paradigm. Pakistan's primary goal is to put policies for the sustainable management of ecosystems into action. These will contribute to preserving natural ecosystems, halting desertification, boosting the amount of forest cover, and safeguarding biodiversity.

By providing funding for emission reduction initiatives in developing nations, the Kyoto Protocol's Clean Development Mechanism (CDM) aims to assist industrialised nations in fulfilling their commitments to decrease greenhouse gas emissions. This method not only

supports global climate goals, but also promotes sustainable development in these countries. Certified Emission Reductions (CERs), which are generated by CDM-covered projects and may be traded or sold, offer a monetary incentive for emission reduction activities.

Pakistan has made progress on a number of environmental measures with the support of the CDM. The nation has put in place a number of CDM projects aimed at enhancing waste management, energy efficiency, and renewable energy sources including solar, wind, and hydro power. These programs reduce greenhouse gas emissions and advance Pakistan's greater sustainable development goals.

Despite its benefits, the CDM faces a number of challenges in Pakistan. Technical and financial challenges can occasionally impede project development and demand a large time and resource investment. Moreover, alterations in the market value of CERs might impact a project's profitability. Institutional challenges, such the need for effective governance and support mechanisms, make the implementation process even more complex. In general, CDM projects in Pakistan have had a positive impact by significantly reducing emissions and encouraging local development. These programs have enhanced infrastructure, created employment, and bolstered the country's capacity for sustained growth. Pakistan has discovered that the CDM is a useful tool for reducing climate change and promoting environmental sustainability, even though there are still problems. a detailed analysis of Pakistan's Clean Development Mechanism (CDM) implementation. The fundamentals of CDM activities in Pakistan, with a focus on how wealthy countries support carbon-reduction programs in developing countries to assist them meet their emission-reduction targets. It covers a variety of CDM initiatives carried out in Pakistan, such as waste management plans, energy-saving improvements, and renewable energy initiatives (solar, wind, and hydro). It

explains the trading and selling procedures for the Certified Emission Reductions (CERs) generated by these projects. consequences of CDM projects on Pakistan's economy and environment. It details how these approaches have helped to advance technology, encourage regional economic growth (Fitz, July 2013) and reduce greenhouse gas emissions.

It is assessed how well CDM project results contribute to emissions reduction and the advancement of sustainable development goals. The challenges faced by Pakistani CDM projects include technical and financial barriers, market fluctuations that affect the value of CERs, and institutional issues. These difficulties frequently make initiatives less financially viable and difficult to perform successfully. The mechanism's twin purpose of encouraging sustainable development and reducing climate change, and it asks for better tactics and infrastructure to increase the efficiency and influence of CDM projects in the nation.

CHAPTER FIVE

DISCUSSION ON RESEARCH FINDINGS

Climate change is considered a non-traditional security threat because it does not fit the conventional definition of security threats like military conflicts, terrorism, or interstate wars. Traditional security concerns typically focus on state-to-state threats, while non-traditional threats extend beyond military considerations and include factors that can destabilize societies and regions in ways that are indirect, long-term, and often less visible in their immediate impact.

1. Global and Long-Term Nature: Unlike conventional security threats, which are often immediate or regionally focused, climate change is a global issue that unfolds over decades and affects all nations, albeit in varying degrees. Its slow onset can make it difficult to categorize as an immediate security concern, but its long-term implications are vast.
2. Cross-Border Impacts: Climate change has transnational consequences. For instance, extreme weather events, sea-level rise, and resource scarcity (such as water and arable land) may lead to conflicts over resources. These issues do not respect national borders and require international cooperation to address.
3. Human Security Focus: Non-traditional security threats, like climate change, are more focused on human security, which includes economic, environmental, social, and political stability rather than just territorial defense. Climate change can exacerbate food insecurity, migration, health crises, and economic instability, leading to displacement and societal breakdown.

4. Indirect and Complex Threats: While traditional security threats tend to have more direct and identifiable causes (such as military aggression), climate change interacts with other factors like poverty, inequality, and governance weaknesses, making it a complex, multifaceted threat. The impacts of climate change can lead to resource shortages, migration pressures, and conflict, but often through indirect channels.
5. Impact on Vulnerable Populations: Climate change disproportionately affects vulnerable and marginalized communities, exacerbating inequalities and leading to social unrest or political instability, which are key concerns in human security frameworks. For example, Pakistan is highly vulnerable to climate events like floods and droughts, which affect its agricultural economy and contribute to displacement, particularly in rural areas.

For Pakistan, this is particularly relevant, as the country is already experiencing severe environmental challenges such as frequent floods, extreme heat waves, and droughts. These conditions put pressure on both the livelihoods of millions and the social fabric of society. As these issues intensify, they could trigger social unrest, forced migration, and even conflict over resources, all of which are hallmarks of non-traditional security threats.Climate change is considered a non-traditional security threat because it doesn't involve direct military conflict or territorial disputes, but it poses significant risks to human security and regional stability. Governments, including Pakistan's, must adapt their security frameworks to address climate-related challenges through preventive measures, international collaboration, and sustainable development strategies.

Although climate change has always occurred on Earth, its current quick rate and significant scale are quite concerning. An imbalance between incoming and outgoing radiation in the atmosphere leads to climate change. The rate of the global warming brought on by climate change differs from previous warming. Global mean temperatures are predicted to increase by as much as 5.4°C by the year 2100. While variations in solar activity and volcanic eruptions have had a slight impact on climate change during the past century, there is overwhelming evidence that human activity has contributed to it. Because of the extensive changes that people have made to natural systems over the past few decades, there has been a net buildup of carbon dioxide in the atmosphere.Ecosystems, biodiversity, and human health are all considered to be seriously threatened by climate change. It has an impact on life all around the world and is linked to changes in the planet Earth's physical environment. Two of society's biggest concerns are mitigating the effects of climate change as well as adapting to its effects. Personalised measures must be implemented by policymakers, particularly for disadvantaged groups.

An imbalance between incoming and outgoing radiation in the atmosphere leads to climate change. The Earth's mean surface temperature rises when the amount of heat-trapping greenhouse gases (such as carbon dioxide, methane, and nitrous oxide) in the atmosphere increases. Compared to the previous 800,000 years, there are currently more greenhouse gases in the atmosphere. More water evapo-rates from the seas and other water sources into the atmosphere as temperature rises, which raises the temperature even more.

There are two main sources of atmospheric carbon dioxide: natural and anthropogenic (caused by humans). The majority of animals, who exhale carbon dioxide as waste, are natural sources of carbon dioxide. Since the early 20th century (the industrial revolution),

human activity has been the dominant source of anthropogenic carbon dioxide emissions. This includes burning fossil fuels (such as coal, oil, and natural gas), as well as emissions from agriculture and deforestation. China, the United States of America (USA), India, Russia, and Japan are the top 5 nations in the world for carbon dioxide emissions. Out of around 32.5 billion metric tonnes of energy-related carbon dioxide emissions globally in 2017, the United States of America emitted about 5.1 billion metric tonnes of the gas. The environmental conditions of the globe Earth and the living things on it are both negatively impacted by climate change. The environment of the physical planet Earth is impacted by all changes that occur to plants, animals, and human life. Human settlements around the ocean, woodlands, and coral reefs are especially susceptible to climate change. The increased vulnerability to chemical contamination might be one of the consequences of climate change. While the majority of climate change's effects are probably going to be negative, certain areas may see improvements in health. For instance, milder winters may result in fewer deaths and health incidents linked to temperature.Due to its numerous effects, climate change is tremendously expensive for society and has a big impact on economic development.The cost of the 2017 and 2018 California wildfires topped $40 billion, while the estimated total direct damage from Hurricane Katrina reached up to $125 billion. By 2090, the economic impact of climate change is predicted to reach hundreds of billions of dollars annually in the United States.Preventive and adaptive measures need significant financial outlays. Around $50 trillion will be needed to stop global warming and cut greenhouse gas emissions to extremely low levels by 2050. By 2028, there would be no more money available to keep global warming below 1.5°C at the present rate of greenhouse gas emissions.Our Earth is being threatened by climate change. Ecosystems that are comparatively intact are becoming fewer and further between. The survival of several plant and animal species, as well as human

health, is significantly impacted by climate change. In the twenty-first century, one of the main causes of species extinction might be climate change.Hundreds of scientists from all across the world provide quarterly studies on biodiversity for the Intergovernmental Science-Policy (Heshmati, November 2020)Platform on biodiversity and ecological services (IPBES). According to the research, biodiversity is disappearing globally, posing a threat to lives, economies, food security, and standard of living. The IPBES chair stated that yesterday or the day before was the appropriate time to take action.Scientists estimate that we have around ten years to prevent carbon dioxide from rising to dangerous levels that might result in irreparable harm. Failing to adopt effective preventative measures might result in the extinction of 15–37% of current species of both plants and animals around the year 2050 and the loss of fifty percent of all species by the year 2100.

5.1 Strategies: Government of Pakistan may use to Fight Climate Change

It's time to stop being apathetic and start actively advocating for climate change. Pakistan has often been listed as one of the nations most impacted by global warming. The effects of climate change are already having a negative impact on our people in many sections of the nation. These effects include increasing sea levels, water scarcity, food shortages, increased heat waves, flash floods caused by glacial melt, and relocation. The fact that these effects will only worsen is the worst part. On the slopes of mountains, the government should immediately start afforestation and reforestation projects. Northern regions have seen extreme deforestation as a result of limited availability to natural gas and power. While the Billion-tree Tsunami effort is a fantastic place to start, it needs to be expanded over time. Plantation drives around the nation must include both the general public and the communities. To store rainfall, construct dams in Thar. The dam in Nagarparkar that

was being utilised as a cricket ground since the government had not consulted the locals and had rejected their advice on the ideal location for the structure. Asking around can often be the easiest way to find the answer. Locals know a fair amount about what kinds of remedies would be appropriate for their situation. Create and put into action a waste management plan specifically for mountainous regions. Due to a lack of proper disposal options, mountain communities either bury their waste underground, which resurfaces in the event of a natural disaster and increases existing risks, or throw it in the rivers or burn it outdoors, which contributes to black carbon deposition on glaciers and speeds up their melting. Efficient waste management practices and raising awareness, particularly among visitors, can reduce greenhouse gas emissions, air pollution, and the likelihood of disasters. Forbid diesel cars in the highlands. More and more visitors to the picturesque northern highlands choose to power their four-wheelers with diesel, the least efficient fuel. The incomplete combustion of fuels at such high elevations releases particulate pollution into the atmosphere, which accelerates climate change and deteriorates human health by causing glaciers to melt more quickly.

Make the move to renewable energy sources. We have a lot of potential for clean, affordable, and reliable energy from hydropower in the north and solar energy in Thar. Recognise that Pakistan faces a variety of climate-related issues in various geographic and cultural contexts. For instance, the effects of climate change in Sindh and Chitral would be very dissimilar. As a result, it's important to brainstorm ideas while considering diversity and context. Use a proactive strategy as opposed to a reactive one. Rather of being ready for a crisis before it strikes, we typically respond to it after it has already occurred. Proactive preparation and awareness will save a great deal of money, time, and lives. Give the development and political agenda a priority when it comes to climate change. Climate change must be considered at all levels as it will impact all facets of human and economic growth.

While it is imperative that these efforts be made, it is equally critical to acknowledge that the government is not solely responsible for bringing about change. As informed citizens, it is our responsibility to demand that these concerns be addressed and to collaborate closely with both governmental and non-governmental organisations to see that these actions are carried out. It's time to stop being apathetic and start actively advocating for climate change.

The necessary project or organisation personnel should adhere to environmental and socioeconomic standards at every stage of the project, including planning, designing, building, and operating. Make sure that academic institutions, civic society, NGOs, and INGOs actively participate in environmental preservation initiatives.If an environmental law infringement results in harm to the property, health, or safety of industrial workers or the neighbouring community, a rating system for the compensation that the polluters and industry owners must pay to the affected parties should be established. To obtain the most recent ambient environmental conditions in and around the industries, an online automated system for obtaining any information related analytical and environmental auditing systems should be developed. In an effort to reduce the sources of pollution, community, small, and medium-sized companies should be provided with educational resources, awareness materials, and compliance help tools.At the provincial and national levels, a standardised computerised system should be created to gather, maintain, and use data about the observance and application of environmental laws and regulations. To minimise communication gaps between environmental management agencies and communities in order to handle environmental challenges, an efficient system should be devised. In this context, all of Pakistan's main cities ought to have city-wide cooperation forums. Most crucially, especially in legal and technical educational settings, the specific topic of environmental preservation and awareness should be required in curricula starting in elementary school. In order to

address new and growing environmental concerns, the environmental councils and agencies should work with the health department to create rules that prescribe processes.

In order to comply with applicable environmental laws and policies, policymakers, chambers of commerce and industry, and regulators must work together to develop a joint program that raises awareness of the advantages of adopting cleaner production technologies. This program should assist SMEs in obtaining green loans from banks to purchase specific energy-efficient technologies, as well as train employees and technology service providers to improve their efficiency. incorporating environmental considerations into economic, spatial, and landscape design. It is necessary to establish legislation to address noise pollution caused by aeroplanes, trains, factories, and building sites. The end of pipe industrial, commercial, and municipal wastewater should be subject to provincial effluent control requirements.

5.2 Strategies community and Individuals may use to fight climate change

Only discuss climate change. What we don't talk about doesn't change. To start the dialogue, reach out, assist, and support those who are vulnerable, as well as to take action collectively, you may organize local climate discussion groups. Instead of pessimism, we need activity. It requires guts to concentrate on an optimistic and proactive strategy. Join a local group addressing climate change concerns as a volunteer or employee. The next time we attend a wedding or celebration, please think twice before overindulging in food. Presently, 43% of Pakistan's population is classified as food insecure, while 40% of the country's food is wasted. The majority of people are unaware of the fact that food waste plays a significant role in climate change. Waste food releases methane, a potent greenhouse gas, into landfills. You may also contribute by giving extra food to charitable organisations or programs that help the less fortunate distribute it, including 'Rizq and the Robinhood Army.

This is a cliche, but it bears repeating: save energy. We must exercise additional caution and turn off electrical devices and lights while not in use in a nation like ours where energy is already scarce and sporadic. When your laptop or phone is fully charged, you may accomplish this by simply disconnecting (Ajani, 2019)your charger. Plugged gadgets continue to add to your cost and the emissions of greenhouse gases and to utilize phantom power. Write about and publish your thoughts and creations. All climate stories, positive or negative, matter. It allows others to share theirs with you. This is by no means an exhaustive list of suggestions; rather, it is only a reminder that there are several scales at which climate action may be taken. Taking action also helps alleviate eco-anxiety, a new psychological disorder characterized by intense worry over the deteriorating health of our world and climate. In moderation, experiencing anxiety over the environmental issue might be beneficial if it spurs you on to avert the dire future. Keep in mind that a lot of modest actions taken by lots of people add up to a lot of change and effect. Given the complexity and urgency of the issue, we must all do our share to address climate change.

5.3 Recommendation

Two key facets of the worldwide reaction of civilization are adaptation to the negative effects of climate change and mitigation of its worsening. In emerging nations, adaptation whether planned or spontaneous is particularly crucial. Personalized adaptation measures must be implemented by policymakers, particularly for the most vulnerable groups. It is not possible to effectively reduce population health risks at the local scale alone. Coordination of international policies is necessary. For food, water, and health, humans depend on functional ecosystems and biodiversity. There may be dire repercussions for humans if other animals are unable to adjust to climate change. Adaptive tactics demand time and expertise. The implementation of initiatives by society, such as drinking stations and wildlife overpasses, is

necessary to assist animals in adapting to the effects of climate change. The identification of characteristics that influence a species' resilience and vulnerability will make it possible to create effective conservation action plans.One important strategy is prevention as a long-term approaches. As quickly as feasible, greenhouse gas emissions should be decreased in order to save species and save people. A new and perhaps tolerable equilibrium in our climate might be achieved if we significantly cut greenhouse gas emissions. Policies to limit the use of fossil fuels, the development and implementation of carbon-free energy technologies, the preservation of forests, and reforestation ought to be encouraged. By taking in and preserving atmospheric carbon dioxide, carbon sequestration helps lessen climate change by lowering the quantity of carbon dioxide that exists in the atmosphere. We need more energy-efficient buildings and cars that run on wind, waves, and solar power. Walking, bicycling, and public transportation usage should all be encouraged. It would also be beneficial if people consumed less red meat and more fruits and vegetables, which are plant-based foods. This kind of dietary adjustment can provide several advantages for the economy, ecology, and health. Under the auspices of the U.N. Framework Convention on Climate Change, several nations collaborate. In order to prevent irreversible harm, the IPCC advises keeping global warming below 1.5°C. Regretfully, there are now nations where there is a lot of political lobbying that disproves human activity's role in climate change and builds political opposition to environmental legislation.

- One of the most important ways to create better communities and raise the standard of living for locals is to include diverse land uses into them.
- Adopt zoning regulations that permit mixed-use projects.
- Segment spaces according to the kind of building, not only its usage.

- Repurpose closed malls for mixed usage. Give mixed-use users financial incentives.
- Rather than using traditional,(Melissa Widhalm & Kara Salazar,) land-consuming construction techniques, provide communities the chance to adopt more compact building designs.
- Place more emphasis on communicating design than density.
- Keep building scale and street type in balance.
- Guarantee entry to green spaces and parks.
- Design your garden to provide seclusion.
- Lessen the amount of impermeable surfaces to reduce stormwater run off offer a variety of accommodation options to suit all budgets.
- Locate and promote empty buildings.
- Update codes to provide builders more options.
- Pass a zoning law that encourages inclusivity.
- Encourage homebuyers to support communal land trusts.
- Provide communities with appealing living, working, learning, and recreational spaces that appeal to all types of individuals.
- Create walkways to connect neighborhoods.
- Place facilities close to residences.
- Upgrade the accessibility and infrastructure of pavements.
- Use traffic islands, speed bumps, and crosswalks to make walking safer.
- Create trails, walkways, and paths connecting shopping areas.

- Create a vision for community growth and construction, then establish the necessary guidelines to achieve it. Thus, the guidelines provide more options for housing and transportation while also aligning with the community's goals of originality and beauty in architecture. Preserve and safeguard the area's distinctive features.
- Create open places; plant trees; save elder trees during development; maintain picturesque vistas.
- Permit eating, shopping and selling on the sidewalk.
- Provide chances for social connection in the community.
- Employ visual indicators to demarcate neighborhoods.
- Set aside cash for preserving historic sites.
- Create "wayfinding" infrastructure for town centers.
- Draw attention to cultural treasures via event evenings and public art.
- Provide money to establish sites of distinction.

To raise the standard of living in a community, protect important environmental regions and direct new development into already-existing communities. List specific locations and devise security measures for them. Implement zoning to promote grouping. Purchase development rights (PDR) or transfer development rights (TDR) to save farms and open spaces. Deal with trusts for land. Establish connections between greenways. Implement policies for urban agriculture.

In the end, you may preserve open space and natural resources on the periphery of cities by focussing future development back towards the communities and making use of already-existing infrastructure and resources. Encourage house restoration and

remodelling in established neighbourhoods by facilitating initiatives. Relocate new public buildings away from the periphery and towards the town centre. Make brownfield and infill initiatives stronger. Start by updating the current infrastructure.It's important to provide locals additional options when it comes to housing, retail, communities, and transportation. Offer transportation, bicycle, pedestrian, and car choices. Connect different forms of transportation. Densify the area surrounding transportation stations. Ensure that the process include the private sector. To update local codes, do an audit. Support developers experimenting with innovative sustainable development initiatives.

Ensure that the process include the private sector. To update local codes, do an audit. Support developers experimenting with innovative sustainable development initiatives. Promote sustainable development through the use of point-based project assessment.

Involve Stakeholders in the Community As the community's members are aware of how they want to see their community evolve and how their own vision of self is mirrored in it, it is important to ensure that the community is deeply involved in the process of sustainable development practices. Look for expert help in community participation and outreach, and include it into the planning process. Make sure that the main goals of community participation are diversity, equity, and inclusion. Apply visioning. Make sure the planning process incorporates suggestions from the community. Engage in media relations. Take into account fresh concepts.

Proactive planning for renewable energy and adverse weather conditions are two more ways to combine smart growth with climate adaption. Apart from strategising for

extensive renewable growth, proactively modifying regulations and enacting directives to permit wind and solar power on diverse properties offers more alternatives and direction on permissible uses, so mitigating controversial disputes (Susman, 2017). Hot zone mapping and flood map updates can help safeguard vulnerable people by planning and managing for more frequent extreme weather events like heat waves and storms. In order to remove obstacles to actively addressing severe occurrences, implementation techniques such as cooler hardscapes, rainwater harvesting, cooling centres, and green infrastructure require corresponding ordinance revisions (US EPA, 2017; Susman, 2017). In order to update comprehensive plans and local ordinances and to fund related implementation strategies, the successful implementation of sustainable development policies and strategies ultimately depends on cooperative and deliberate involvement of the community with landuse those who make decisions and local leadership.

5.4 Conclusion

For Pakistan's energy security, economic growth, and environmental sustainability, the government must quickly develop a comprehensive energy plan, as well as legal and regulatory measures that address crucial reforms in the parasternal energy companies and power market, improve revenue collection, foster investment, and quicken efforts to develop the country's domestic renewable energy and gas resources.

The government of Pakistan ought to reorganise the "single-buyer" system and completely decouple the electricity industry, all the while giving top emphasis to enhancing the industry's earnings and financial standing. To enhance commercial operations and produce revenue for the government, it is recommended that distribution businesses in large cities like as Lahore,

Islamabad, and Faisalabad that perform better be privatised. talk. Pakistan has the potential to become a more competitive power market, but development is being impeded by the highly politicised singlebuyer system one in which the government controls transmission. Despite the fact that private generating has surpassed governmental generation, distribution losses remain excessive and require significant expenditures.

There are new opportunities for a less centralised and more transparent commercial operation of the system due to the economic competitiveness of renewable energy sources and the possibility for distributed gas systems. Now is the time for policymakers to start completely unbundling the system, switch to bilateral contracts, and allow third parties access. "The DISCOs and NTDC are not at arm's length from the Power Division of the Ministry of Energy and remain in an entrenched bureaucratic culture," the World Bank's evaluation report on Pakistan states. The National Energy Regulatory Commission has been reviewing the CPPA's request to become a market operator; this is encouraging, but further restructuring is required. The original privatisation of DISCO was a requirement of the previous IMF US$6.6 extended financial facility, and the Sharif administration initially declared plans to privatise distribution in the main cities of Faisalabad, Lahore, and Islamabad, where incomes and affordability are greater. However, the Sharif government was prevented from pursuing this goal by political opposition, and it was shelved in 2016. Khan has the chance to bring this process back to life. In March 2019, the minister of privatisation said that several generation businesses and nine distribution companies will be added to the list of state-owned enterprises up for sale. Political backing for robust legal enforcement of collections, including by government entities, and rationalisation of tariffs will be crucial, even though other countries' experiences demonstrate that investments in accurate metering,

billing, and collections can reduce losses. Overcoming government nonpayment and the circular debt overhang is an obvious challenge.

Pakistan should create a top-priority program to assist private sector entrepreneurs and non-governmental organisations in their attempts to commercialise solar power systems in rural regions while maintaining strict quality and service standards. In addition to promoting bank lending for these projects, they ought to help local distribution firms and solar system suppliers collaborate, particularly with regard to minigrid and microgrid technology interface problems. Pakistan ought to take into account adopting the Bangladesh Infrastructure Development Company Limited (IDCOL) public-private partnership model, which has demonstrated remarkable success in securing more than $500 million in donor funding for the extensive installation of off-grid solar photovoltaic systems by private organisations. Pakistan is attempting to electrify remote areas with solar energy. The Sindh Solar Energy Project, which would fund 200,000 solar residential (DR. ROBERT F. ICHORD, JANUARY 2020) systems and bigger grid-connected units, has received approval from the World Bank.In order to build these programs and make sure that reliable technical standards are followed, Pakistan must go to the private sector for entrepreneurial expertise. It can benefit from previous experiences in East Africa and South Asia, where there is significant commercialisation going on for minigrids and solar residential systems.

It is well acknowledged that the rate of climate change is increasing. All facets of life are being impacted by climate change. It is acknowledged as posing a severe risk to biodiversity, the ecosystem, and human health.The two biggest issues facing society now are mitigating the effects of climate change on health and preventing its worsening. Research on climate change and its effects should be encouraged, as should training for health professionals and

public and politicians. Multiple actions at different levels are necessary for adaptation. Personalised adaptation solutions need to be implemented by policymakers, particularly for the most vulnerable groups.Reducing greenhouse gas emissions and improving Earth's land surface's ability to filter emissions of greenhouse gases from atmospheric emissions can both lessen the effects of climate change.

As a non-traditional security challenge, climate change puts Pakistan's social, economic, and environmental stability in grave danger. The government's reaction has to be strengthened further in terms of both implementation and adaptation capabilities, even if it has been demonstrated by significant programs like the National Climate Change Policy (NCCP), the Billion Tree Tsunami, and disaster preparedness plans. These measures demonstrate an understanding of the risks associated with climate change, including food insecurity, displacement, harsh weather, and water shortages. However, consistent political will, the distribution of resources, and strong governance structures are necessary for these programs to succeed. Pakistan has to prioritise local community participation, increase cross-sectoral collaboration, and construct climate-resilient infrastructure in order to successfully address climate change as a security threat. Long-term resilience requires a stronger focus on early warning systems, adaption plans, and the development of renewable energy sources. Furthermore, the monetary and technical support required to solve the climate-related issues endangering national security may be obtained through international collaboration and adhere to global climate accords. In summary, although Pakistan's policies and goals provide a vital basis, a more thorough and coordinated strategy is needed to lessen the many threats that climate change poses to the nation's future.

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