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**EVALUATION OF CLIMATE CHANGE
POLICIES IN THE CONTEXT OF
ENVIRONMENTAL SECURITY IN PAKISTAN**

Mehak MEHMOOD

Master's Thesis

Supervisor

Assoc. Prof. Alper KALİBER

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The thesis titled EVALUATION OF CLIMATE CHANGE POLICIES IN THE CONTEXT OF ENVIRONMENTAL SECURITY IN PAKISTAN prepared by MEHAK MEHMOOD and submitted on 25/08/2023 has been **accepted unanimously** for the degree of Master of Arts in Political Science and International Relations.

Assoc. Prof. Dr. Alper KALİBER
Supervisor

Thesis Defense Committee Members:

Assoc. Prof. Dr. Alper KALİBER	Department of International Relations Altınbaş University	_____
Assist. Prof. Dr. Mehmet Turan ÇAĞLAR	Department of International Relations Altınbaş University	_____
Assos. Prof. Dr. Kadri Kaan RENDİ	Department of International Relations Hacettepe University	_____

I hereby declare that this thesis meets all format and submission requirements for a master's thesis.
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Mehak MEHMOOD

Signature

XXXXXXXXXX

DEDICATION

First and foremost, I would like to thank my thesis supervisor, Assoc. Prof. Alper KALİBER for accepting me as a Master student at Altınbaş University Department of Political Science and International relations Master Program. Their insightful remarks and recommendations helped me to complete this thesis. He always supported me and direct me towards better. My heartfelt gratitude also goes to my Altınbaş University colleagues who stood with me. Last but not least, I'd want to express my gratitude to my family and especially to my parents, who always stand behind me with their best wishes.



ABSTRACT

EVALUATION OF CLIMATE CHANGE POLICIES IN THE CONTEXT OF ENVIRONMENTAL SECURITY IN PAKISTAN

MEHMOOD, Mehak

M.A, Political Science and International Relations, Altınbaş University,

Supervisor: Assoc. Prof. Dr. Alper KALİBER

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A new security context centred on alternative principles and solutions in the environmental framework has evolved as a result of the more visible effects of environmental degradation and the inability of traditional security concepts to provide effective treatments. Environmental security had entered the literature as the idea of security expanded in the Cold War era. To identify who the subject is or ought to be secured, the problem has been examined in a variety of ways by common, human, and ecological security approaches. The framework of this study is based on the notion of environmental security and various approaches to it in this context. Due to its detrimental physical consequences on the environment, which make it the most difficult environmental problem in the world, climate change is perceived as a security threat to the environment. The purpose of this study is to investigate how perceptions of environmental security may affect climate change. Although human activities and natural processes both are the reason of climate change, it is generally agreed that anthropogenic (human-induced) effects are what make these problems worse.

Since the years when the impacts of change were acknowledged and added to the international community's agenda, there has been an ongoing negotiating process. Pakistan

is one of the important players in this process because of its size, location, political unrest, and geopolitical position, which all connect to difficulties with climate change. Pakistan is chosen as a case study in this context to assess climate change policies from an environmental security viewpoint; as a result, general security issues, as well as climate change-related policies, and perceptions of security in Pakistan, have been examined. The literature review approach was utilized to investigate these features, and scientific books, journals, theses, and online resources were used. The policies of climate change as they are being practised in Pakistan demonstrate that environmental security has primarily been viewed from a government-based conventional security perspective. Aside from that, there is little indication of an ecological approach, even though Pakistan has occasionally been able to combat climate change using common and human security views.

Keywords: Environmental Security¹, Traditional Security², Common Security³, Human Security⁴, Ecological Security⁵, Climate Change⁶, Pakistan⁷

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ABBREVIATIONS

ARE	:	Alternative and Renewable Energy
AEDB	:	Alternative Energy Development Board
BRA	:	Baloch Republican Army
BLA	:	Baluchistan Liberation Army
CDM	:	Clean Development Mechanism
EPA	:	Environmental Protection Agencies
EIA	:	Environmental Impact Assessment
GOP	:	Government of Pakistan
GDP	:	Gross Development Product
GEF	:	Global Environmental Facility
GHG	:	Green House Gases
GLOF	:	Glacial Lake outburst Floods
GCRI	:	Global Climate Risk Index
HDI	:	Human Development Index
INDC	:	Intended Nationality Determined Contribution
IPCC	:	International Panel on Climate Change
MOCC	:	Ministry of Climate Change
MW	:	Megawatt
NDMA	:	National Disaster Management Authority
NEC	:	National Environmental Consultants
NDC	:	Nationally Determined Contributions
NOAA	:	National Oceanic and Atmospheric Administration

NASA	:	National Aeronautics and Space Administration
NSIDC	:	National Snow and Ice Data Centre
NCCP	:	National Climate Change Policy
PCCF	:	Pakistan Climate Change Fund
PEPA	:	Pakistan Environmental Protection Act
PEPC	:	Pakistan Environmental Protection Council
PEPO	:	Pakistan Environmental Protection Ordinance
SAR	:	IPCC Second Assessment Report
SDG	:	Sustainable Development Goals
TAR	:	IPCC Third Assessment Report
TERI	:	The Energy and Resources Institute
UNDP	:	United Nations Development Program
UNFCCC	:	United Nations Framework Convention on Climate Change
UNEP	:	United Nations Environment Programme
WB	:	World Bank
WG1	:	IPCC Working Group 1 (IPCC 1.)
WG2	:	IPCC Working Group 2 (IPCC 2.)
WG3	:	IPCC Working Group 3 (IPCC 3.)
WWF	:	World Wildlife Fund
WHO	:	World Health Organization
WMO	:	World Meteorological Organization

1. INTRODUCTION

The surface of the Earth is getting hotter. A greenhouse gas impact is caused by polluting gases that are released into atmosphere because of increasing rate of population, urbanization, and industry. Mechanisms to balance carbon dioxide emissions are broken down because of the degradation of forest. Climate change is now the world's most important issue on a global scale as a result of all of this. As the direct effects of environmental problems and climate change on societies have been seen for the last 30 years, solutions on the issue have increased from all over the world. In this sense, the events in question have started to be evaluated with the security dimension. The concept that best describes the relationship between environment and security in the context of environmental problems and social problems is the concept of "environmental security".

The concept of "Environmental Security" can be explained by the changing environmental security within the historical process of the international security and what is the value attributed to this new environment. In addition, changing actors and processes in the international security environment have also been effective in the emergence of the concept of environmental security. Apart from the traditional security approaches and definitions in which the nation-state is an actor, humanitarian security approaches have emerged that bring the individual to the fore over time.

This study aims to investigate the potential impact of environmental security perception in the climate change process by revealing the points where the concept of "environmental security", which stands out with the effect of environmental problems, harmonizes with climate change policies. In this context, an exemplary country will be used to make analysis. The country to be examined as an example within the framework of the subject is Pakistan. Pakistan is an important issue in this regard, as it is one of the developing countries where population density, geographical size and the effects of climate change are felt the most. The importance of the study is to emphasize that the connections between environment and safety were effective even centuries before they entered the literature, and that the environmental security perspective has been discussed from different aspects since then.

During the study process, some questions were encountered while conducting examinations. What is the position of the environment in security policies in the process of increasing the devastating effects of climate change? Who are the actors who will provide security in this process and how does it define security? Beyond environmental security, the multidimensional effects of climate change are ecologically based. Can it play a role in the development of security understanding? It is accepted that the asset to ensure environmental security is human. The definitions of security, influenced by the traditional security approaches dominated by the nation-state, have turned to humanitarian security approaches that prioritize the individual over time. From this point of view, we come across another question. Why is the subject human even in the concept of environmental security, and can ecology security, which are ecosystems whose subject includes people, come to the fore instead of environmental security? What are the roles of states in this regard, as will be examined with the example of Pakistan? As a result of the study, answers to these questions encountered while evaluating will be provided.

The study is composed of four main chapters. The introduction is dedicated to state the aims and objectives of the current thesis as well as to give background information about its case study. This introductory chapter also includes a brief outline of each chapter and information about methodology.

The second chapter focuses on "Environmental Security", which also forms the theoretical framework of the study. In this section, first of all, the process in the late 1980s and after which environmental problems and climate change effects began to be accepted, will be examined. The concept of "Environmental Security", on the other hand, became evident with the end of the Cold War and the exposure of the environment as a threat and risk area. In this sense, as the effects of the Cold War begin to decrease, the changing object and actors of security will be analysed, and the development process of the concept of "environmental security", one of the five main sectors affected by security, will be examined by referring to the "security" approaches of the thinkers of the Copenhagen School. During the development process, environmental security was perceived from different perspectives within the framework of whose or what security questions. Traditional, common, humanitarian, and ecological security are approaches that perceive environmental security from different

perspectives. These approaches play a decisive role in countries' policies towards climate change.

In this chapter of the study, the climatic changes that occur will also be examined in detail. The reasons for climate change related to the impact of natural and human activities will be explained by using scientific data. International negotiation processes will be examined regarding the effects of change on a global basis, how they are perceived in the international environment and what measures are taken to solve the problem. In this section, the relationship of climate change with the concept of security will be evaluated; The threats and security vulnerabilities it will create on beings such as nature, people and the state will be determined. The security perspectives of Traditional, common, humanitarian, and ecological on climate change will be addressed within the context of environmental security perspective.

The third chapter of the study focuses on Pakistan. Pakistan is an exemplary country where the theoretical analysis made in this section will be evaluated practically; the negativities it experienced due to climate change and, additionally, the climate change policies applied by the government. It will be investigated in the light of its policies, documents and agreements signed. Pakistan's socio-cultural and economic structure are important at this point. The specified structures will be examined, and Pakistan's security perception and security priorities will be investigated. Security policies and climate change policies implemented in the country will be examined. The perception of environmental security will be revealed by examining the climate change policies implemented in Pakistan and national and international discourses. My contribution to the field is to be describing the case study of a country ranked 5th large country in the world for the highest population. The study will contribute to the country's environmental security challenges and its implication towards human security. The recommended policy changes can improve the execution of the climate change policy in Pakistan. The case study will be investigated in light of its policies, documents, and the agreements it has signed. Pakistan's socio-cultural structure and economic structure are important at this point. Pakistan's security perception and security priorities will be investigated by examining the specified structures. Security policies and climate change policies implemented in the country will be examined. The climate change policies implemented in Pakistan in the national and international arena will be examined

and the perception of environmental security will be tried to be revealed. In the last section, all research and examinations carried out during the study will be discussed under the title of "Conclusions". A critical perspective will be adopted when making evaluations in the study.

In the last part, all research and examinations carried out during the study will be discussed under the title of "Conclusions". A critical point of view will be adopted when making evaluations in the study.

While researching climate change, current research data and official documents accepted in the international arena will be used. While examining Pakistan, research will be carried out from the official documents of the state, the discourses of the government regarding the environment and the policies it follows. Throughout the research process, the literature of secondary sources and documentary analysis of primary sources will be used; relevant books, articles, theses, and internet resources will be used. Official documents and data will be added to the research by examining the sites of Pakistan's relevant ministries. No field studies were conducted on Pakistan because the Pakistan case study was examined as an example supporting the theoretical discussion. The focus of the research is on the evaluation of security approaches and policies towards climate change as an environmental security problem. In the study, environmental security, ecological security, Pakistan, and environmental policies were examined in terms of climate change and it was tried to contribute to the lack of resources within the scope of Turkish literature in the field of international relations.

Since the Industrial Revolution, synthetic emissions of greenhouse gases from the combustion of fossil fuels, deforestation, and agricultural practises have contributed to global warming and climate change. Warmer temperatures altered precipitation patterns, and frequently changes in the meteorological events such as droughts, storms, floods, and heatwaves have adverse effects on people and the environment. Numerous experts have projected that the effects of climate change will wreak havoc on both human and natural systems and that it now poses a threat to people.

For Pakistan, climate change is a major problem. The country is especially susceptible to the negative effects of climate change, including increased temperatures, rain patterns, and a

massive change in the frequency of extreme weather occurrences like floods and droughts. These effects will undoubtedly exacerbate current socioeconomic and political problems and have considerable ramifications for the nation's agriculture, water resources, and public health.¹

The protection of human societies and the environment against the negative effects of environmental degradation, such as climate change, deforestation, pollution, and biodiversity loss, is referred to as environmental security.² Like many developing nations, Pakistan confronts serious environmental issues that endanger its political stability, public health, and economic and social progress. In recent decades, both the developed and developing worlds have recognized the significance of climate change. Global leadership and experts have understood that poor countries face the greatest barrier to effective regulation, which might be the case to assist policy implementation, making it much more difficult for them to address climate change.³ Moreover, they do not have sufficient funds to invest in climate change adaptation and mitigation.

Pakistan is situated in the south-east Asia. The country shares border on the east with India, on the west with Afghanistan and Iran and north with China. One of Pakistan's largest cities, Karachi, is situated in the southern part of the country close to the Arabian Sea. Pakistan has a surface area of 796,095 sq. km, of which 25,220 are water-covered. Pakistan as an agricultural country has 35.2 % of the land is irrigation. The population lies between 0-14 years is 36% and 34% is the ages between 25-54 years and the growth rate is 2.07 % per annum. The literacy rate is 59% and most of the male-educated population.⁴ The human development Index (HDI) report of 2019 shows that Pakistan ranks 152 out of 189 countries included in United Nations HDI. The HDI value for Pakistan is 0,560, where life expectancy

¹ J. Hussain et al., "Climate change impacts and adaptations for wheat employing multiple climate and crop models in Pakistan," *Climatic Change*, vol. 163, 2020 pp. 253-266.

² G. Zurlini and F. Müller, "Environmental security," *Encyclopedia of Ecology*, vol. 2, 2008 pp. 1350-1356.

³ C. Betzold and F. Weiler, "Development aid and adaptation to climate change in developing countries," Springer, 2018.

⁴ CIA, "The world factbook," [Online]. Available: "Pakistan - The World Factbook" (cia.gov), accessed Jul. 01, 2023.

is 67 years, average years of schooling are 5,2 years and gross national income per capita is 5.190 dollars.⁵

One of the most pressing environmental issues in Pakistan is water scarcity. The report by the Pakistan Council of Research in Water Resources indicates the country's water resources are rapidly declining, 40% of shortfall in water supply projected by 2025. This has significant implications for the country's agriculture that accounts for about a quarter of its GDP and half of the employees are its labour force. Moreover, water scarcity has also led to conflicts between provinces and communities, exacerbating political tensions.⁶

1.1 PURPOSE OF THE STUDY

This study examines the complex relationship between environmental issues and security concerns. It aims to explore the various dimensions of environmental security particularly the impacts of climate change. For this purpose, Pakistan will be examined as a case study. This thesis aims to evaluate the impacts of climate change on the environmental security of Pakistan. The study will also assess the effectiveness of existing climate change policies in the country. The study will pay particular attention to the environmental security challenges in Pakistan. Pakistan is a crucial case in this regard as it is one of the developing countries where population density, geographical size and the effects of climate change are felt the most. In this respect, it is a country whose reactions and attitudes are important in the context of international climate change agreements. The importance of this thesis is to emphasize in the connections between the environment and security.

1.2 RESEARCH OBJECTIVES

While examining the case study of Pakistan the following research question will be encountered.

- a. What are the main environmental security challenges of Pakistan in the context of climate change?
- b. What are the key drivers of climate change in Pakistan and how much they have impacted the environmental security of Pakistan?

⁵ UN Human Development Index, [Online]. Available: " Pakistan ranked 152nd in UN Human Development Index" (nation.com.pk), accessed Jul. 02, 2023.

⁶ Annual Report (2017-18), [Online]. Available: <https://agp.gov.pk/> (accessed Jul. 01, 2023).

c. To what extent the existing climate change policies of Pakistan has been effective

What policy recommendations can be made to enhance the effectiveness of climate change policies and promote environmental security in Pakistan?

1.3 METHODOLOGY

While researching climate change official documents accepted internationally will be used. While examining Pakistan, research will be carried out on the official documents of the state, the government on the environment and the policies it follows. Throughout the research process, the literature of secondary sources and documentary analysis of primary sources will be used; relevant books, articles, theses, and internet resources will be used. Official documents and data will be added to the research by examining the sites of Pakistan's relevant ministries. No field studies were conducted on Pakistan because the Pakistan case study was examined as an example supporting the theoretical discussion books, articles, and internet resources will be used. Official documents and data will be involved in the research by examining the sites of Pakistan's relevant ministries. In light of the information collected throughout the research, the necessary analysis will be made, and the result will be reached with the situation evaluation. A comprehensive analysis will be adopted in the study. The focus of the study is on the evaluation of security approaches and policies for climate change as an environmental security problem. In the study, environmental security, ecological security, Pakistan, and environmental policies issues were examined in terms of climate change and tried to contribute to the lack of resources experienced within the scope of Turkish literature in the field of international relations; It was aimed to shed light on subsequent studies on the subject. For this purpose (the CIA) Development Index (HDI) The Nation, National Disaster Management Authority (NDMA), National Climate Change Policy (NCCP) The Global Climate Risk Index (GCRI) Intended Nationally Determined Contribution (INDC), the Ministry of Climate Change (MOCC) Pakistan Climate Change Fund (PCCF) United Nations Development Program (UNDP) World Bank (WB) Global Environmental Facility (GEF) National Environmental Consultants (NEC) UNICEF will be used.

2. THEORETICAL FRAMEWORK OF ENVIRONMENTAL SECURITY

Global climate change causes a significant threat to the planet and all living beings. In South Asia, Pakistan is the 5th most effected country towards climate change. All the political, economic, and social aspects of the country will be affected due to global climate change. The word threat creates one of the keywords in the term of research is the centre of the study.

Global climate change will affect all living beings from the smallest unit to the largest unit globally. Therefore, it is important what the concept of security creates and what perception it forms. Although the concept of environmental security began to enter the literature after the Cold War, environmental issues have been intertwined with the concept from the first moment the need for security emerged. For this purpose, the first part is based on the definition of security, the environmental points that exist in the concept will be determined. The current perception of the concept will be studied by examining the environmental threats within the traditional concept of security. From the moment environmental security entered the literature it has been a subject of discussion with its definition and content. Finally, apart from all approaches to the concept of environmental security, the ecological security approach will also be mentioned before the policies to be implemented on global climate change. It has made more appropriate suggestions for the solution of a global problem, especially due to the common security it has put forward based on decision-making processes.

2.1 DEFINITION OF SECURITY

According to the Oxford Dictionary definition, security is a condition of being free from threat and danger.⁷ Security also refers to taking actions to guarantee the security and protection of individuals or the state. Peace, stability, and predictability are social constructs that define security, which allows people and communities to live with their core values.⁸ Dalby defines security as a series of common desires that want to get away from danger.⁹

⁷ C. A. Meerts, "Security: Concepts and Definitions," in L. R. Shapiro and M-H. Maras, Eds., *Encyclopedia of Security and Emergency Management*, Living ed., Springer, 2018, pp. 1-3.

⁸ J. P. Burgess, Ed., "Handbook of New Security Studies," Routledge, 2010.

⁹ S. Dalby, "Security, Modernity, Ecology: The Dilemmas of Post-Cold War Security Discourse," *Alternatives: Global, Local, Political*, vol. 17, no. 1, pp. 95–134, 1992.

According to Wolfers' definition, the concept of security has two aspects, first objectively owned there is no threat to the values being, and subjectively there is no fear that there will be an attack on these values.¹⁰ Barry Buzan emphasizes that security is the fundamental concern for the survival and well of being of individuals, groups, and societies.¹¹ Keohane highlights the idea of security as a dynamic process which includes social interactions and the reduction in violence rather than just the absence of threats.¹² According to Baldwin, security is a state or situation that is attained by defensive measures that repel hostile activities. Baldwin, Kupchan¹³ and other scholars define security as a dynamic process that involves controlling threats using a wide variety of methods outside the realm of traditional military power.¹⁴ According to Booth's definition, security is a situation in which people and states may pursue their interests, obligations, and human rights peacefully.¹⁵

The origin of the concept of security was also seen in ancient times, but the use and content of the concept has undergone many changes. According to the concept of Arends, it was used in three general ways until it became important and meaningful. According to Thucydides, it was this strengthening of Athens and the fear it provoked in Sparta that made the war necessary.¹⁶ The idea of strengthening this fear that appeared in Sparta and other urban states and turning it into hatred and anger caused the main target of the politics of the Athens Empire to be security.¹⁷

Throughout the Mediterranean world, the Pax Romana played a crucial role in establishing an idea of security within the Roman empire during its period. It maintained internal stability and border security although it was not absolute security for all regions but somehow it maintained its control.¹⁸

¹⁰ Wolfers, A., "National security" as an ambiguous symbol," *Political Science Quarterly*, vol. 67, no. 4, pp. 481-502, 1952.

¹¹ B. Buzan, "People, States & Fear: An Agenda for International Security Studies in the post-Cold War Era," 2008.

¹² Keohane, R.O., "International institutions: Two approaches," in *International Organization*, pp. 171-188, Routledge, 2017.

¹³ D. A. Baldwin, "The concept of security," *Rev Int Stud*, vol. 23, pp. 5-26, 1997.

¹⁴ Kupchan et al., "Power in transition: the peaceful change of international order," 2001.

¹⁵ K. Booth, "New thinking about strategy and international security," Taylor & Francis, 1991.

¹⁶ J. S. Nye Jr. and D. A. Welch, "Understanding Global Conflict and Cooperation: Introduction to Theory and History," Pearson Education, Harlow, 2014.

¹⁷ Ç. Vural, "Çevresel güvenliğin gelişimi," *Ankara Üniversitesi Çevre Bilimleri Dergisi*, vol. 6, no. 1, pp. 20-38, 2018.

¹⁸ L. D. Wasson, "Pax Romana - World History Encyclopedia," [Online]. Available: https://www.worldhistory.org/Pax_Romana/ (accessed Jul. 02, 2023).

Until now, it has been tried to briefly state what security is, how it is defined and how it emerged in its contemporary form. In the next section, the period when security studies are perceived as a separate area and studies are starting to be conducted and security perceptions in this period will be addressed.

2.2 THE CONVENTIONAL CONCEPT OF SECURITY

As defined in the previous section, the word security means a state of being which is far away from danger, damage, and threat. In this sense, security is a secure environment; where there is no violence, conflicts, or wars. Discussions about security have continued throughout history, and security has often been discussed through the concepts of war and peace. According to Waltz 19, philosophers' opinions about the reduction and overcoming of conflicts and wars have shown fundamental differences over the causes of war. Accordingly, 'Is war a compulsory part of human existence or not?' when this question was evaluated, in International Relations pessimistic and optimistic views emerged. The pessimistic views reflect the representation of "Realism" and the optimistic views represent "Idealism." Realism is the philosophy of Thomas Hobbes and Idealism is the tradition of Immanuel Kant. The thinkers who share different views are based on Hugo Grotius's philosophy. [19] According to Hobbes's philosophy, the world is prone to violence there is no way to overcome it. On the other hand, in Kant's philosophy, there is a way to live peacefully, and the nature of violence must be overcome and there is a third philosophy which says it is possible to develop a peaceful society if some rules and norms are followed but there is no way to eradicate violence.²⁰

On the continuing debate of whether wars and conflict should be overcome was the step taken by the League of Nations after the first world war. US President Woodrow Wilson addressed that "It is an organization established on the basis and whose purpose is to resolve problems and conflicts between countries peacefully, by ensuring a political consensus."²¹ The League of Nations has been established on the basis of an Idealist approach. But when

¹⁹ K. Waltz, "Man, the State, and War: A Theoretical Analysis," Columbia University Press, 2018."

²⁰ J. Baylis, "The concept of security in international relations," in "Globalization and Environmental Challenges: Reconceptualizing Security in the 21st Century," Springer, 2008, pp. 495-502.

²¹ W. Wilson, "League of Nations," [Online]. Available: Speeches by Woodrow Wilson: League of Nations (usembassy.de), accessed Jul. 02, 2023.

the stance could not prevent World War II, the Realist view became a basic school during the Cold War after 1945. [20]

The realist perspective of security has been dominant during the Cold War. Realists contend that the world is hazardous and that there are trends toward warfare at any moment. There is no way to create a global government. They contend that the power balance keeps the world at peace. The state is the only actor in this situation that can resolve disputes in international relations. States utilize force to do this, and they all make efforts to maintain security through military and strategic methods. The majority of the work done on security-related matters during the Cold War included state-level military concerns. As a result, a problem is classified as a security concern (high policy) if it involves the use of military action; otherwise, it is classified as a low policy issue.

2.3 THE CONCEPT OF ENVIRONMENTAL SECURITY

The security and preservation of the natural world, including its ecology, resources, and the welfare of the communities that depend on it, from environmental threats and issues called environmental security. According to the UNEP, Environmental security includes managing environmental threats, promoting sustainable development, and ensuring ecosystem, biodiversity, and natural resources ²² Environmental security is the connection between environmental issues and human security which emphasized along with the possible effects of environmental deterioration, climate change, shortage of resources and pollution on human well-being. ²³According to another scholar “To maintain the sustainability of human lifestyles, the resilience of ecosystems and the availability of essential resources refers to environmental security. ²⁴

2.4 ENVIRONMENT AND SECURITY RELATIONSHIP

The meaning of the word environment covers a wide range. By general definition, the environment is the sum of physical, chemical, biological, and social factors at a given period that can have an indirect or direct impact on human activities and living beings in an

²² UNEP - "UN Environment Programme State of the Environment Report", (1994) – Kiribati [Online]. Available: <https://www.unep.org>

²³ S. Dalby, "Environmental Security," U of Minnesota Press, 2002.

²⁴ T. F. Homer-Dixon, "Environment, Scarcity, and Violence," Princeton University Press, 2010.

immediate or long time. The physical, chemical, biological, and social factors mentioned in the definition are key points to focus on here.

In human history, the role of the environment is very crucial. The link here can be established with Maslow's Theory of Hierarchy of Needs, the first and most basic need of the individual is physiological needs which include air, water, food, and shelter, the second one is safety needs when physiological needs are met, individuals seek security and safety which include protection from physical harm and a safe environmental ²⁵As seen in the first two of Maslow's Theory of Hierarchy of Needs, these needs are related to survival. The need for continuity of these vital activities is provided by the physical, biological, chemical, and social factors mentioned in the definition of environment.

2.5 ENVIRONMENTAL SECURITY PRINCIPLES

In the development process of the concept of environmental security, the way it is perceived has varied. In this sense, it was mentioned that it is a subject of different definitions and phases. Naturally, the principles of the concept have also undergone some changes in this process. While the perception of the concept within the framework of different approaches and the discussions based on it continued, its principles were also continued to some changes. Eleven basic principles were proposed to elaborate more in the first years when the concept entered literature. ²⁶ These can be cited as follows:

- a. equality of rights over natural resources
- b. prohibition of damage in the ecological sense.
- c. Observation of ecological security
- d. Regular exchange of information on national and regional issues
- e. Preventing damage to the environment
- f. Cooperation in ecological emergencies
- g. Cooperation in scientific and technological fields
- h. Trial of peaceful ways of solving ecological problems occurring in international boundaries

²⁵ A. H. Maslow, "A theory of human motivation," Classics in Management Thought-Edward Elgar Publishing, vol. 1, p. 450, 2000.

²⁶ K. R. Spillmann, "Environmental Crisis: Regional Conflicts and Ways of Cooperation: Report of the International Conference at Monte Verità, Ascona, Switzerland, 3-7 October 1994," Center for Security Studies and Conflict Research/Swiss Federal Institute of Technology, 1995.

- i. Taking responsibility for the environment at the international level
- j. Providing sustainable development
- k. Increasing the quality of security so that people can live in the most suitable environment condition.

As can be understood from the above principles, according to this point of view, Human welfare should be used to understand and communicate the idea of environmental security. The most important values of people, communities, and nations are susceptible to environmental changes and disruptions.²⁷ In this respect, the issue impacts all living and non-living things on the planet, regardless of how environmental security actors or items are viewed from different angles. The general principles of environmental security are becoming evident today, despite of individual, human communities, state, or biosphere. Ak explained environmental security principles as follows.²⁸

- a. Protection of ecological balance,
- b. Prevention of environmental conflict,
- c. Supporting environmental cooperation activities,
- d. Questioning the function and role of the nation-state,
- e. Reducing the environmental effects of military activities,
- f. Attention to Democracy and to the protection of human rights,
- g. Supporting sustainable economic activities,
- h. Reducing the negative effects of population growth,
- i. Reducing environmental migration,
- j. Ensuring resource security during the urbanization process,
- k. Poverty reduction,

Environmental security is essentially able to penetrate every point where all living and non-living things interact. When environmental security is mentioned, all environmental issues can be included in this security scope from micro to macro shortages of resources to global climate change. Furthermore, before moving to the issue of global climate change, the issue

²⁷ J. Barnett, "Environmental Security and Peace," *Journal of Human Security*, vol. 3, no. 1, pp. 4-16, 2007.

²⁸ A. K. Tarık, "ÇEVRESEL GÜVENLİK YAKLAŞIMININ SİLAHLI KUVVETLERE ETKİSİ," *Dokuz Eylül Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, vol. 17, no. 2, pp. 133-145, 2015.

of ecological security which examines the relationship between the environment and security with different approaches will be addressed.

2.6 ECOLOGICAL SECURITY

With the awareness of environmental changes and deteriorations, it was mentioned in previous sections that the environment began to be included in security issues in this sense, environmental security and ecological security emerged in the same process and the development processes have been merged at the same point from time to time. For example, one of the situations described as a crucial step towards raising awareness of ecological security is that Soviet leader Mikhail Gorbachev cares about ecological threats and makes an urgent call to the entire world about them.²⁹ Ecological security is an approach based on balance and well-being within the ecosystem.³⁰

With a different definition, it is the preservation of dynamic balance in a constant relationship between human communities and the essential of ecosystems in which human communities are part of.³¹ If balance cannot be achieved, people and other species will have terrible problems that can lead to extinction. Since these results also affect people, based on the links between human health and safety in some circles. anthropocentric (human-centred). Framework based on the links between health and security and ecological security is shown as a variant of the concept of human security. [31]

Within the framework of ecological security, several principles have been established to solve the problem of climate change both at the national and global levels. [29]

- a. To move towards positive environmental conditions, the environmental activities to be implemented should only take place with the participation of individuals, but also with states.
- b. Equality principle should be taken as a basis,
- c. Damages at the ecological level should be prohibited,

²⁹ A. S. Timoshenko, "Ecological Security: Global Change Paradigm," *Colo. J. Int'l Env'tl. L. & Pol'y*, vol. 1, p. 127, 1990.

³⁰ R. Fiedler, "Andrew Heywood, *Global Politics*, Palgrave Macmillan 2011, pp. 560," *Przegląd Strategiczny*, vol. 2, no. 2, pp. 193-194, 2012.

³¹ R. Floyd and R. Matthew, "Environmental Security: Approaches and Issues," Routledge, 2013.

- d. To make environmental improvements, the developed projects should be applicable, and the studies conducted, in general, should be monitored.
- e. Global exchange of information on environmental issues should be made,
- f. Scientific and technological cooperation should be made,
- g. Environmental damages that exceed the limits should be avoided,
- h. Cooperation should be made in emergency ecological situations,
- i. International disputes need to be resolved,
- j. International responsibility awareness should be motivated for damages that occur with environmental problems,
- k. Sustainable development should be essential.

In this context, the environmental security principles given in the previous sections and the ecological principles have similar content. The major difference is that the reference point of the concept of ecological security is ecosystems. It reveals a 'deep' green political approach by taking ecological systems, in other words, the ecosystem, not individuals, communities or states is an object of application. Briefly, security is not for individuals or states, but for ecological systems in which people are involved. [27]

Table 2.1: Approaches to Environmental Security in Terms of Actor and Application Object

APPROACHES TO THE ENVIRONMENTAL SECURITY	TRADITIONAL SECURITY	COLLECTIVE SECURITY	HUMAN SECURITY	ECOLOGICAL SECURITY
PURPOSE	Ensuring national security	Ensuring national security and international security	Ensuring the security of human life	Ensuring ecosystem security
SECURITY PROVIDER	State	State and international organization	Individuals, Societies, States, International Organizations, Non-Governmental Organizations	Individuals, Societies, States, International Organizations, Non-Governmental Organizations
SECURITY OBJECTS	State	State	Individual	Ecological system in which all species are considered equal including human beings

As shown in Table 2.1 the comparison among different approaches have been made in terms of the reference object and actors to the concept of environmental security (the focus of these approaches is mostly on the state, which focuses on people). In this scenario, the concept of environmental security stands out in state-oriented national security policies. Ecological security has a holistic perspective, it aims to maintain ecological balance eventually. According to the concept of ecological security, main threats to security are harmful effects of human's activities to nature, and ultimately the response and deterioration corresponding to these effects, and damage to other species. [27]

In the first part, it has been shown that the traces of environmental security which have existed for centuries before entering the literature and the importance it carries for both states

and individuals. Environmental security constitutes the theoretical framework of the current study at hand. In the next section, “climate change” will be examined in depth and the link between environmental security and climate will be delineated.

2.7 CLIMATE CHANGE

The climate is changing. The most critical issue facing the world community is the changing climate caused by global warming, which is occurring at global scale. While debates over the existence of climate change and the magnitude of its consequences continue, it is generally acknowledged that these phenomena are caused by human activity. (anthropogenic). If immediate and adequate action is not taken by individuals, societies, states and the international community, the effects of climate change will be extremely worse. Global climate change is accelerating as international negotiations on the issue continue and its effects are getting worse. Security concerns are raised because of climate change, which has become a threat to people, society, states, and the ecosystem as a whole. However, environmental issues have long been acknowledged as a security issue, while not receiving as much attention.

In the next section, the causes, evidence, and effects of climate change will be examined first, then, the negotiation process, which started with the alertness of climate change in the international community will be discussed and efforts and arguments aimed at reducing or preventing change will be examined first within the environmental security approach, then climate change within traditional security, common security, humanitarian security, and ecological security approaches.

2.7.1 The Causes And Effects Of Global Climate Change

Global climate change is a complex issue with various internal dynamics, the causes, evidence, and effects are intertwined. Therefore, each of them will be examined under separate headings.

2.7.1.1 Definition of climate change

There have been ice ages and tropical climates on Earth for 4.5 billion years, but climate change refers to broad, everlasting changes in the planet's weather conditions or average temperatures. These climatic changes across the planet have varied with temperature rise

and decrease. During the Holocene Age, which has been going on since the ice age (Pleistocene Age), which ended about 11,000 years ago; temperatures have remained relatively stable (compared to the previous age), except for a few periods (Holocene glaciation) but average temperatures have increased in recent years.³²

It is important to state that there is a difference among the terms of climate change, weather, and global warming before discussing the issue of climate change in general. The main difference between weather and climate is the duration of the catastrophe. While climate refers to long-term trends and averages, weather is mainly about the daily, short-term fluctuations in atmospheric conditions. Although they are sometimes used interchangeably, global warming and climate change are two distinct ideas with distinct meanings. The main difference between climate change and global warming is how they differ in scope. Global warming exclusively focuses on the rise in the planet's average surface temperature, whereas climate change encompasses a wider variety of modifications in the Earth's climate system.³³

In summary, global warming is a type of climate change that can lead to extraordinary disasters on the planet. The most striking details about the planet's warming emerge with the temperature on the Earth's surface increasing by 0.85 degrees from 1880 when measurements began in 2012.³⁴ The standard surface temperature of the Earth continues to rise due to human activity in 2020, systematically tying 2016 as the warmest year recorded. NASA.³⁵

2.7.1.2 Natural variables

In terms of interactions between the atmosphere, ocean, and land as well as variations in the Number of solar radiations that reaches the globe, climate change is a typical component of the planet's natural variability. Significant evidence for historical global-scale climate shifts can be found in the geological records. [33] Many natural factors affect the climate. Any direct or indirect effect of these factors leads to changes in the climate. The natural conditions

³² Ç. Vural, "Küresel iklim değişikliği ve güvenlik," Güvenlik Bilimleri Dergisi, vol. 7, no. 1, pp. 57-85, 2018.

³³ NOAA's "Ten Signs of a Warming World: Global Sea Level." [Online]. Available: <https://cpo.noaa.gov/warmingworld> Accessed: Jul. 01, 2023.

³⁴ IPCC Climate change 2013 : "The physical science basis" [Online]. Available: <https://www.ipcc.ch> (accessed Jul. 01, 2023).

³⁵ Earth System Science | NASA Science – "Climate Change: Vital Signs of the Planet. " [Online]. Available: <https://climate.nasa.gov> (accessed Jul. 01, 2023).

affecting the climate can be listed as follows: Variations in the Earth's orbit and axis in solar energy, reflection and clouds, greenhouse gases in the atmosphere, tidal events, and impact of the moon on climate, ocean and atmospheric events, tectonic movements, volcanoes, geological processes, plankton, and microbes.

The climate on Earth has also changed a long time before human activities began to affect the Earth. Changes in the world's radiation balance have been the main driving source of climate changes on a global basis in the past but the reasons for such changes are diverse. All the previously mentioned natural states affecting the climate (changes in the earth's orbit and axis, ocean, atmospheric events, etc) have played a role in climate change in the past.³⁶

2.7.1.3 Impacts of human activities

Human activities have contributed to climate change due to the increase of GHG, aerosols, and cloudiness in Earth's atmosphere. The fossil fuel caused CO₂ gas and its release into the atmosphere which leads to global warming. Greenhouse gases and aerosols affect the climate and the energy balance of the earth by changing solar radiation and outgoing infrared radiation. The richness and properties of different gases and particles in the atmosphere change the cool or warmth of climate system. Human activities, which have increased since the beginning of the Industrial Revolution, have had a warming effect on climates.³⁷ The human influence that caused the change of the climate of these periods is largely above the influence of natural causes such as volcanic eruption and tectonic processes. [36] Most scientists think that this warming process which triggers climate change is because of the greenhouse gas emissions contributed by humans.³⁸

Four major greenhouse gas emissions are brought on by human activity. These include halocarbons (a class of gases that includes fluorine, chlorine, and bromine), methane (CH₄), nitrous oxide (N₂O), and carbon dioxide (CO₂). The density of these gases, which exist in the atmosphere, their increased accumulation cause more emission. In this sense, the most important increase in atmosphere, accumulation and density of gases was experienced in the industrial age. [36] It can be stated by considering all these; human activities have changed

³⁶ IPCC (2007), "Climate Change ." [Online]. Available: <https://wedocs.unep.org/> (accessed Jul. 01, 2023).

³⁷ J. B. Foster, "Marx's Ecology: Materialism and Nature," NYU Press, 2000.

³⁸ Evidence | "Facts – Climate Change: Vital Signs of the Planet". [Online]. Available: "<https://climate.nasa.gov/evidence/> (accessed Jul. 01, 2023).

the natural soil cover of the world with the changes in crop area, pastures, and forests in the process from the industrial revolution till the present day. It also caused the reflective properties of the abdomen and ice change. [36] The causes of global climate change has addressed. In the next section, scientific data revealed that climate change which occurs because of human activities and natural causes will be examined.

2.7.1.4 Evidence and effects of global climate change

The increase in average temperatures and others can be understood by measurements from the atmosphere and satellite data. while addressing evidence of climate change, Data from centres including NSDIC (National Snow and Ice Data Centre) and Met Office Hadley Center as well as NOAA (National Oceanic and Atmospheric Administration), NASA (National Aeronautics and Space Administration), and others were used. The following scientific evidence supports the idea that climate change and global warming are actual phenomena:

Global temperature rise: According to independent research by centres such as NASA and NOAA, Earth's surface temperatures reached the highest temperature record since 1880, when measurements began to be made in 2016. [38] This shows almost the warming has occurred in the last 36 years. In addition, 2015 is the first date when the global average temperature was 1 degree and above, from the average range of 1880-1889.

Rising sea level: Tide indicators and satellites show sea levels rising globally. [33]The spherical sea level has risen by about 17cm in the previous century. Furthermore, the rise is almost twice in rate as compared to previous century. [38] Rising waters threaten ecosystems, freshwater resources, and human development on the coast. [33]

Ocean warming: The rising temperature of the oceans is one of the foremost fragment pieces of evidence of global climate change. According to experts, increased solar heat is increasingly absorbed by the ocean ³⁹ Thermometers on ships show that air near the ocean surface warms up, increasing the evaporation of water. This situation creates an intense increase in precipitation events and as result floods and floods on land. [33]

³⁹ N. N. W. S. US Department of Commerce, "Weather History". Available [Online] <https://www.weather.gov/> (accessed Jul. 01, 2023).

Changing Ice sheets: Greenland and Antarctic glaciers which contain a large scale of fresh water on Earth are shrinking at an accelerating rate. [39]

Melting Arctic Glaciers: According to data received by satellite, ice-covered areas are decreasing in the Arctic Ocean. Glaciers in this region have deteriorated rapidly over the previous decades, both in scope and thickness. [38] In January 2017, record low levels were also observed in the Southern Hemisphere glacier areas, (based on the same month in the past). with the effect of all these, globally, the glacial cover in the seas is recorded as low and remained at that level. ⁴⁰

The shrinking of Glacier Masses: The situation that occurs when glaciers melt or disappear faster than the accumulation of snowfall and the formation of new glaciers is the withdrawal event. Higher temperatures and less snowfall have caused the glaciers on Earth to withdraw recently. [40]

Snow Cover Reduction: According to data from satellites, the snow-covered area is getting smaller and smaller in the Northern Hemisphere in the spring months. Accordingly, the amount of snow cover has decreased at large rates in the last 50 years and started to melt earlier. [38] The situation where is ecological diversity is decreasing may cause climate change. In cities and rural areas, the pressure of agriculture and industry on habitat (natural environment) causes a decrease in the diversity of genetics, species and ecosystem or life forms found all over the world (biodiversity). People are directly through actions such as biodiversity, cutting trees, and the habitat of other living things; they also indirectly affect through their impact on the global climate. ⁴¹

Extreme weather events: At global level, the frequency and severity of extreme weather events including tropical storms and hurricanes, heat waves, droughts, forest fires, and floods are increasing. Since 1950 the temperature of United States has been increased and the low temperature has been decreased. [38]

Ocean Acidification: The surface water of ocean has become more acidic than it was at the beginning of industrial revolution. As the result of human activities CO₂ is being produced

⁴⁰ Science of Glaciers | "National Snow and Ice Data Center. " Available [Online] <https://nsidc.org> (Accessed Jul. 01, 2023).

⁴¹ "Global Change Project, Biodiversity Loss" [Online]. Available <http://www.priweb.org/globalchange> Accessed: 26 May 2023

more and its consumption in atmosphere hence, more carbon dioxide is consuming in ocean. Every year, the top layer of the seas absorbs an additional 2 billion tons of carbon dioxide. The marine environment is harmed by this acidity. In solving the problem, all units, from individuals to states and more, are significant; but in general, because states are the most important decision-makers, The process of international negotiations on this issue is critical for global climate change. In the next section, the processes from the moment the issue of global climate change begins to take the attention of the world will be examined and the negotiations that take place in the international environment will be focused.

2.8 INTERNATIONAL NEGOTIATIONS ON CLIMATE CHANGE

Climate change is a global issue, so it requires a solution on a global basis. The discussion on the subject continues. Since the beginning of industrial revolution, the consumption of greenhouse gases into atmosphere the countries involved have had to change; but due to the transboundary impact of greenhouse gas emissions in terms of global climate change, its emergence in London or Beijing does not change anything and is distributed in different regions in the atmosphere. In this sense, the effort of a country to minimise the use of greenhouse gas emissions means little to stop or slow down heating unless other countries make the same effort. To reach a solution, all countries and individuals must act by making the same effort.⁴²

COP stands for Conference of the Parties. It refers to an annual meeting of all countries that are parties to the United Nations Framework Convention on Climate Change (UNFCCC). The UNFCCC is an international treaty established in 1992 to address global climate change. Countries can discuss and negotiate accords relating to the climate on a form provided by the COP meetings.

Several significant COP meetings were held before the adaption of Paris Agreement in 2015 to set the basis for international climate action. The significant COP summits that preceded the Paris Summit are listed below:

⁴²C2ES - "Center for Climate and Energy Solutions Center for Climate and Energy Solutions. " [Online]. Available: <https://www.c2es.org> (accessed Jul. 02, 2023).

COP1 (1995, Berlin, Germany): The UNFCCC's parties met for the first time at COP1. It concentrated on creating the UNFCCC's institutional and organizational framework and starting conversations about significant climate challenges.⁴³

COP3 (1997, Kyoto, Japan): The Kyoto Protocol, a global accord that established industrialised nations' legally force to decrease their greenhouse gas emissions, was adopted as a result of COP3. According to the protocol, the initial commitment period ran from 2008 to 2012.⁴⁴

COP11 (2005, Montreal, Canada): Discussions at COP11 focused on the Kyoto Protocol's extension beyond its initial commitment term. The "Montreal Action Plan," which was adopted by the parties, led to the launch of negotiations for a new international climate agreement that would involve all countries, including major emitters like China and the United States.⁴⁵

COP15 (2009, Copenhagen, Denmark): COP15 was a key meeting to advance the Kyoto Protocol's goal of a worldwide climate accord. The Copenhagen Accord was formed, however, there were difficulties in the discussions, and it was not a formal contract.⁴⁶

COP16 (2010, Cancun, Mexico): The Cancun Agreements, which were the result of COP16, provided a framework for pursuing global climate action. Decisions were made about technology transfer, emission reductions, climate financing, and help for poor nations.⁴⁷

COP17 (2011, Durban, South Africa): COP17 saw the approval of the Durban Platform, which started discussions on a new international climate accord that would be adopted by 2015 and implemented from 2020 onwards.⁴⁸

⁴³ "UNITED NATIONS Framework Convention on Climate Change, " (1995), [Online]. Available <https://unfccc.int/> (accessed Jul. 02, 2023).

⁴⁴ "COP 3 | UNFCCC. " [Online]. Available <https://unfccc.int/event/cop-3> (accessed Jul. 01, 2023).

⁴⁵ "Conference of the Parties to the United Nations Framework Convention on Climate Change " (11th sess. : 2005 : Montréal [Online]. Available: <https://digitallibrary.un.org> Accessed: Jul. 02, 2023

⁴⁶ "Copenhagen Climate Change Conference" – (Dec 2009), [Online]. Available: <https://unfccc.int/conference/copenhagen-> (accessed Jul. 02, 2023).

⁴⁷ "United Nations Framework Convention on Climate Change" (16th session. : 2010 : Cancun [Online]. Available: <https://digitallibrary.un.org> (Accessed Jul. 02, 2023).

⁴⁸ COP17 / "CMP7, Durban, South Africa" [Online]. Available: UNFCCC." <https://unfccc.int/news/cop17-cmp7-durban-south-africa> (accessed Jul. 01, 2023).

These COP meetings were crucial in shaping global climate discussions and laying the groundwork for the 2015 Paris Summit. The Paris Agreement, which was agreed at COP21, established a thorough and inclusive framework for all nations to take climate action, marking a critical milestone in global efforts to address climate change.

2.8.1 The Paris Conference Of The Parties

The Paris Conference of the Parties (COP21) held in Paris, France, between November 30 and December 12. An important turning point in the history of global climate negotiations was the Paris Summit, which resulted in the adoption of the Paris Agreement, a historic worldwide agreement to combat climate change.

Paris Agreement: The approval of the Paris Agreement was the main result of COP21. The accord made a framework for international cooperation to keep global warming below 2 degrees Celsius over pre-industrial levels and to continue efforts to restrict the increase of temperature. It points out the necessity of acting against global warming, including capacity-building, financing, technological transfer, and mitigation.

Nationally Determined Contributions (NDCs): As part of the Paris Agreement, each signatory nation is expected to submit a voluntary climate action plan known as an NDC. In these strategies, the plan was to decrease the use greenhouse emission. Every five years, NDCs are evaluated and amended to increase ambition.⁴⁹ (Article-3 Page no.2)

Long-Term Objectives: The Paris Agreement demands a satisfactory agreement between human-caused greenhouse gas emissions and removals by the middle of this century. This objective is often referred to as achieving "climate neutrality" or "net-zero emissions," respectively. Additionally, it highlights the significance of increasing adaptive capacity, boosting resilience, and decreasing susceptibility to the effects of climate change.

Financial Assistance: The Paris Agreement recognizes the importance of financial assistance in supporting the efforts made by developing countries to tackle climate change. By 2020, rich countries hope to spend \$100 billion yearly to support underdeveloped countries' efforts

⁴⁹ "Paris Agreement" (2015). [Online]. Available: "Paris Agreement English" (unfccc.int) (accessed Jul. 01, 2023).

at mitigation and adaptation. The agreement also highlights the requirement to increase funding after 2020. (Article 13 (9) Page 11)

Transparency and Accountability; To improve the clarity, transparency, and understanding of nations' climate activities, the Paris Agreement established a strong transparency framework. As part of it, greenhouse gas emissions and NDC progress are routinely reported. Every five years, a global stocktake process is also managed to evaluate overall progress and guide further measures. (Article 13 no.10)

The Paris Conference of the Parties marked a significant turning point in international climate efforts since it brought nearly all countries together in a single commitment to combat climate change. The agreement's broad acceptance and emphasis on voluntary, nationally defined initiatives have helped give the fight against climate change more global impetus. In this section important developments in the process of international negotiations on climate change were discussed. In the next section, the connection between the effects of global climate change and security will be examined and the security approaches that stand out against the negative effects of climate change will be addressed.

2.9 GLOBAL CLIMATE CHANGE AND SECURITY

Climate change is a global problem. It's predicted that it has physical, social, political, economic, and environmental effects in countries. Therefore, it will cause various vulnerabilities for all living and non-living beings.

2.9.1 The Effects Of Global Climate Change On Security

Climate change has several uncertainties in terms of the details of the situation it will cause. Despite the uncertainties, it will affect all units of nations and international relations politically, economically, and socially. This is where global climate change interacts with the concept of security. Numerous studies have highlighted the possible threats and difficulties, notwithstanding the complexity and context-specificity of the causal relationships between climate change and security. Here is an in-depth examination of how security may be impacted by global climate change.

Resource Scarcity and rivalry: Because of climate change, there may be more rivalry for scarce resources and even potential violence. Some significant effects include.

Water Scarcity: As temperatures rise, changing precipitation patterns and increasing evaporation may cause water supplies to become scarce. Especially in areas already experiencing water stress, this may escalate tensions and disputes over water supplies. According to the World Bank, more than 40% of the global population may experience water scarcity by 2050.⁵⁰

Food Scarcity: Climate change consequences including extreme weather occurrences, shifting rainfall patterns, and temperature variations may have a considerable impact on agricultural production, endangering the security of the food supply. Food insecurity and even social unrest may result from this. The IPCC predicts that climate change will have a negative influence on crop yields, particularly in tropical regions IPCC.⁵¹

Migration and population displacement; Environmental changes caused by climate change may result in migration and demographic shift, which might be problematic for regional dynamics and societal stability. Major effects include.

Climate refugees: Increasing frequency of extreme weather events, eroding coastlines, and rising sea levels can make certain locations untenable and cause people to flee their homes. Low-lying coastal regions and small island countries are particularly at risk. According to the Internal Displacement Monitoring Centre, 26.4 million people were uprooted by climate-related events in 2020.⁵²

Resource-Driven Migration: People may migrate in search of greater liveable circumstances and access to resources because of environmental deterioration and resource shortages, such as land degradation or water stress. This may put a burden on the host countries, heighten social unrest, and even cause resource-related wars in target regions. By 2050, the World Bank predicts that climate change may cause 140 million people to be uprooted from their homes in Sub-Saharan Africa, South Asia, and Latin America.⁵³

⁵⁰ World Bank Group (2019) "Working-Together-for-a-Water-Secure-World". [Online]. Available: <https://documents1.worldbank.org/> (accessed Jul. 02, 2023).

⁵¹ IPCC 2019 Chapter 5: "Food Security" [Online]. Available: <https://www.ipcc.ch> (accessed Jul. 02, 2023).

⁵² IDMC 2021 "GLOBAL REPORT ON INTERNAL DISPLACEMENT" [Online]. Available: <https://www.internal-displacement.org> (accessed Jul. 02, 2023).

⁵³ "UNITED NATIONS WORLD MIGRATION REPORT 2018. UNITED NATIONS PUBNS", 2018[Online]. Available: <https://www.iom.int> accessed Jul. 02, 2023).

Political Instability and Conflict: Through several ways, climate change can worsen current conflict dynamics and contribute to political instability:

Resource-Related Conflicts: Rivalry over limited resources can exacerbate already-existing tensions or trigger new conflicts. Land, water, and energy access disputes may cause small-scale wars or worsen racial and political tensions. Over 40% of domestic conflicts in the previous 60 years have been linked to natural resources, according to the Baste et al.⁵⁴

Migration-Induced Conflict: Large-scale migration caused by climate change can put a burden on host communities, heighten social tensions, and even lead to violence between migrant groups and locals. According to research, an inflow of migrants may put a burden on public services, increase economic inequality, and fuel social unrest and political instability in the communities they settled in.⁵⁵

State Fragility: States that are in a vulnerable situation may be disproportionately affected by climate change, such as severe weather conditions and increase of sea level. This weakness may result in internal strife, unstable political conditions, and even state failure. The Fragile Nations Index emphasizes how vulnerable fragile countries are to the consequences of climate change and their low potential for adaptation.⁵⁶ These impacts are interconnected with security and influenced by socio-economic and political factors. In the next section, prominent security approaches to eliminate the effects of climate change that threaten these factors will be examined.

2.10 SECURITY APPROACHES TO GLOBAL CLIMATE CHANGE

Global climate change affects all systems directly or indirectly. It creates different security problems for states, nations, communities, and individuals. For example, sea level rise in atoll countries such as Tuvalu and Kiribati poses a threat to people's survival on their islands. Again, because of climate change impacts, In Bangladesh the families who are residents on low deltas are at the risk of flood. Similarly, many examples can be given; therefore, due to climate change the security of the world is at stake. Not for certain communities, cultures,

⁵⁴ I. A. Baste et al, "Making peace with nature: a scientific blueprint to tackle the climate, biodiversity, and pollution emergencies," United Nations Environment Programme, 2021.

⁵⁵ M. Letta and R. S. J. Tol, "Weather, climate and total factor productivity," Environmental and Resource Economics, vol. 73, no. 1, pp. 283-305, 2019.

⁵⁶ "FRAGILE STATES INDEX ANNUAL REPORT" (2021), [Online]. Available: www.fundforpeace.org (accessed Jul. 02, 2023).

and countries, but for the whole world with the its effects. [27] However, as detailed in the first chapter, the problems caused by environmental hazards, terrorism, etc remained overshadowed by national security issues until a certain period; especially with the increase in climate change concerns and the observation of their effects, global climate change has been included in the “security” process. According to the David King the main scientific advisor to the UK government, climate change poses a much larger threat than international terrorism.⁵⁷

The physical implications of global climate change have been briefly discussed, including melting glaciers, rising sea levels, loss of island coast lanes, less-usable soils, drought, disease spread, and changes in planting and harvesting seasons. These tangible consequences include less access to fresh water, decreased trade, decreased physical security, less trade, less access to food, heighten social tension, degradation of human health, greater widespread poverty, and increased immigration [41]. Global climate change, a direct danger to environmental security, is viewed as such by conventional, common, human, and ecological security perspectives. In terms of the actor and reference object, different dimensions were considered. (As detailed in the first section). In the study, the issue of climate change will be discussed primarily within the environmental security approach and the with other approaches as its direct effects are on environmental security.

2.10.1 Environmental security and global climate change

The IPCC Report in 2007, where anthropogenic influences on global climate change were unequivocally acknowledged, the topic of environmental security, which has been addressed since the early 1990s, became more serious and difficult. In addition, the withdrawal of the US emphasis on the "war on terror" allowed other security agendas to step forward. Several studies drew attention to the climate change can cause an increase in conflict and migration and reinforced the urgency of environmental security.⁵⁸ Climate change and security-related problems are not new. In the talks on the implications and adaptation of climate change, scientists and policymakers have underlined that the effects will be detrimental to human health. They did this in a way consistent with environmental security discourse. As examined

⁵⁷ BBC NEWS | "Science/Nature | Global warming 'biggest threat. " [Online]. Available: <http://news.bbc.co.uk/2/hi/3381425.stm> (accessed Jul. 02, 2023).

⁵⁸ S. Dalby, "Climate Change: New Dimensions of Environmental Security," *The RUSI Journal*, vol. 158, no. 3, pp. 34-43, 2013.

in the first section (environmental security), while the process of formation of the word security is addressed, pay attention to the links between environmental destruction and human well-being, especially in respect of access to food and water.⁵⁹

Apart from the physical effects of global climate change, environmental security is also associated with situations caused by these effects. In this sense, concerns about resource scarcity are also the subject of environmental security discussions. The number of disputes that appear in regions where there are no effective governmental regulations is not low, according to research on resource scarcity and the conflict it produces. This has brought new challenges to environmental security discussions.⁶⁰ Thus, links to national security and environmental security have also come to the fore. Likewise, the humanitarian security and environmental security link has drawn attention to poor people who have experienced more vulnerability to extreme nature events (drought, floods, storms, etc.) in recent years [68]. Here we also come across issues of justice and equality. The biggest responsible for greenhouse gas emissions which are the cause of global climate change are industrialized countries. Poor people in unindustrialized on the other hand are more vulnerable due to poverty and subdevelopment in the face of the consequences of global climate change⁶¹ It was stated that global climate change engages in environmental security because it contains environmental threats and reflects directly on the environment. The four discourses on climate security that I discuss here are chosen and categorized based on how they define the referent object, or whose security is being considered. The valid answers to this question are "people" (human security), "nation-states" (national security), "the international community" (international security), and "ecosystem" (ecological security"), which are mentioned here.⁶²

2.10.2 Traditional Security And Global Climate Change

Among the leading discourses of global climate change, it is seen that the emphasis is on the importance of the threats that climate change will pose to the nation-state security. [62] In the traditional approach to security, the state is seen as the main actor and the unity that

⁵⁹ N. Detraz and M. M. Betsill, "Climate Change and Environmental Security: For Whom the Discourse Shifts," *International Studies Perspectives*, vol. 10, no. 3, pp. 303-320, 2009.

⁶⁰ S. Dalby, "Climate Change: New Dimensions of Environmental Security," *The RUSI Journal*, vol. 158, no. 3, pp. 34-43, 2013.

⁶¹ "Paleontological Research Institution." [Online]. Available: <https://www.priweb.org> accessed Jul. 02, 2023).

⁶² M. McDonald, "Discourses of Climate Security," *Political Geography*, vol. 33, pp. 42-51, 2013.

provides security in international politics and according to this approach, national security must be ensured first.⁶³ Global climate change, on the other hand, will be able to affect national security in three ways; weakening elements of national power, contributing to the failure of the state or leading to violent conflict, and triggering conflicts. National power is the result of various factors. These variables usually include environmental elements such as geography and resource ability (military capacity, intellectual capacity, population size and the size of the national economy).⁶⁴ Any of these national power elements will be damaged by the impact of global climate change. For example, if military forces are wanted to be used in drought conditions or flooded terrain difficulties will be faced in designing and planning power. perhaps the biggest predictable danger is related to the economic development of climate change to what extent it will negatively affect, mostly in the underdeveloped or fragile countries of the world.⁶⁵ In this sense, it is widely accepted that developing countries will suffer more from the changes that will occur due to their dependence on natural resources due to climate change and lack of finance and infrastructure for adaptation.⁶⁶

The long-term effects of climate change on national security are related to conflicts. The prediction that resources scarcity that arises due to changes will cause conflicts has been expressed by some researchers.⁶⁷ Global climate change will affect national security in these three ways as mentioned. Since the application object that dominates security discourse and politics in traditional security is the nation-state, strategies will be followed in this direction, considering the outcomes of global climate change as a national security issue.⁶⁸

2.10.3 Common Security And Global Climate Change

In common security approach, environmental changes and disruptions are seen as integral parts of national security issues. Yet, it is suggested that global responses are needed to deal

⁶³ Dergisi. (2018), "Jandarma ve Sahil Güvenlik Akademisi Güvenlik Bilimleri Enstitüsü," [Online]. Available: www.jsga.edu.tr Accessed: Jul. 02, 2023.

⁶⁴ R. Floyd and R. Matthew, "Environmental Security: Approaches and Issues," Routledge, 2013a.

⁶⁵ R. Floyd and R. Matthew, "Environmental Security: Approaches and Issues," Routledge, 2013b.

⁶⁶ C. McSweeney, et al, "Improving the Accessibility of Observed and Projected Climate Information for Studies of Climate Change in Developing Countries," Journal of American Meteorological Society, vol. 91, no. 2, pp. 157-166, 2010.

⁶⁷ R. Floyd and R. Matthew, "Environmental Security: Approaches and Issues," Routledge, 2013c.

⁶⁸ J. Barnett, "The Meaning of Environmental Security: Ecological Politics and Policy in the New Security Era," Zed Books, 2001.

with this problem. [28] Global climate change is a significant issue. It is rapidly producing bad results across the world. In this regard, it is crucial to pinpoint potential climate vulnerabilities and strains in regions where these pressures would have the most impacts on both national and global security.

In terms of national security, five crucial areas are particularly at risk due to climate change: agricultural production, freshwater resource availability and quality, vital mineral access, and sea level rise. and a decline in political ties with other nations as a result of differences over global policy. ⁶⁹ Political disputes between countries are remarkable at this point. International meetings are held particularly regarding reducing GHG, which is the biggest cause of global climate change. In the ongoing disagreements in these meetings, the changes will accelerate and worsen due to the inability to act towards a solution. Climate change will affect the entire planet. In this sense, it is important to develop international mechanisms for greenhouse gas emission reduction and cooperation strategies to be made will be the most crucial step in reducing climate change impacts. [69] While highlighting the risks that climate change poses to national security and stability, it also makes the case for the need for international and global collaboration to combat the menace of climate change. The international community is the security component, and the rules of this community are viewed as being threatened by climate change. International cooperation is deemed to be especially crucial in attempts to alleviate the consequences of climate change and adapt. [62]

2.10.4 Humanitarian Security And Global Climate Change

The humanitarian security approach takes people as the main reference object of security and accepts environmental living space as a key factor for people according to Ak.[37]. Global climate change is at a level that will affect the entire environmental habitat. At the district and local levels, scientists, decision-makers, and practitioners come together at the realization that the commonly and severity of extreme weather events will increase their potentially disastrous economic and social repercussions. Due to the combined consequences of extensive environmental, economic, social, demographic, and technological changes, disasters will not only occur with these threats but also by widening

⁶⁹ Ç. VURAL. "KÜRESEL İKLİM DEĞİŞİKLİĞİ VE GÜVENLİK," The Journal of Security Sciences, vol. 7, no. 1, pp. 57–85, 2018.

the spectrum of hazards. In this sense, climate change effects bring critical thresholds for human security eventually.⁷⁰

Broadly defined, human security means ensuring fundamental rights and livelihoods and looking for opportunities for self-realization and development.⁷¹ In this way, there is a complicated interdependence between the global climate and human security. For instance, the detrimental consequences of climate change on food security eventually will result in future generations having more urgent food needs. One of the most serious threats to human security that comes from climate change is the likelihood of mass migration as a result of biophysical and ecological degradation. [70]

2.10.5 Ecological Security And Global Climate Change

The ecological security approach is like environmental security in terms of emergence points, development processes and actual applications and differs in some basic points. The most significant difference is that the ecological security approach takes ecosystems, including humans as reference objects. [69] The core of ecological security is a need for radical rebalance and interaction between people and environment. It both isolates' people from the environment and highlights the necessity of reevaluating the social, political, and economic systems that contribute to environmental changes. In this way, ecological security promotes a reconsideration of how people interact with the environment. [62]

The basis of ecological security discourse is based on the ecosystem's resistance to time and species. This resilience is based on the capacity to make life sustainable and to maintain organizational structure and functionality, even in the event of a disorder and changes. The most critical point in this regard is the ability of actors to adapt, which requires strict compliance, continuous communication, and modesty. Because the ecosystem is too complicated for harsh policies. So, the principles to be applied should be re-evaluated according to local knowledge, management, understanding and values.⁷²

⁷⁰ K. O'Brien, et al, "Disaster Risk Reduction, Climate Change Adaptation and Human Security: A Commissioned Report for the Norwegian Ministry of Foreign Affairs," in Disaster Risk Reduction, Climate Change Adaptation and Human Security: A Commissioned Report for the Norwegian Ministry of Foreign Affairs, 2008, pp. 78-78.

⁷¹ W. N. Adger, et al, "Human Security," in Cambridge University Press, 2014.

⁷² M. McDonald, "Ecological Security," E-International Relations, 2015. [Online]. Available: <http://www.e-ir.info/2015/11/28/ecological-security/> (Accessed: June. 27, 2023).

In the previous section, the causes, evidence, and effects of climate change have been examined in depth . Climate change caused by human activities is the most urgent problem for the entire world. While the negotiation processes conducted within the framework ongoing discussions of the states, climate change is accelerating even more. Nevertheless, the environmental security perceptions of countries and the climate change policies they implement with this perception is important. In the next chapter, the potential impact of environmental security perception in the climate change process in Pakistan's case study will be examined.



3. CASE STUDY OF PAKISTAN

Climate change is one of the most significant global environmental issues faced by nations and especially people with its effects on natural ecosystems, food production, freshwater supply, health, etc. According to the most recent scientific assessments and the IPCC Reports mentioned in the previous chapter), climate systems are different at global and regional level. As the biggest cause of climate change are human activities. Historically, developed nations have been primarily responsible for rising greenhouse gas emissions; however, developing nations are also anticipated to contribute to a growing rate of emissions in coming years. One of the actions to solve climate change is the effort to put development in a sustainable shape. When regularly incorporated into broad initiatives intended to increase the sustainability of domestic and local development trajectories, climate policies will be more effective. The ability of countries to accomplish the goals of sustainable development will be compressed by climate change, its effects, climate policy responses, and concomitant socioeconomic development. Pakistan is one of the developing countries in this category. With its population, geographical location, and political turmoil Pakistan is a crucially important case when it comes to climate change. Indeed, it is a country where the physical effects of climate change are seen intensely.

Due to their stated sensitive situation, Pakistan is an example of analysing security and climate change impacts in research. In this sense, the general, historical, political, and administrative structures of Pakistan will be addressed briefly. Then, Pakistan's domestic, regional, and global security problems will be examined. Then, the physical, social, political, and economic effects of climate change, which are involved in these security problems will be discussed in detail. Finally, the focus will be on Pakistan's policies against climate change impacts.

3.1 LITERATURE REVIEW

Countries located in the region of south Asia are thought to be the most susceptible to climate change. Despite all of its weaknesses, Pakistan has grown its role in climate change, but in many small communities around the nation, the situation is getting worse due to a lack of

knowledge and ignorance. The level of policy implementation and mitigation in South Asia must be improved by national and international policymakers. [1]

The South Asian region has seen annual climatic extremes in the worst ways possible, including rising temperatures, rising sea levels, and retreating glaciers. The yearly variation in rainfall is proof of this climate change.⁷³ The living conditions of the impoverished in these locations are impacted by this type of climate change.⁷⁴ Geographically, Pakistan is sited in a region where the effects of climate change are already rather strongly felt.

According to the Global Climate Risk Pakistan is in the list of top 5 countries that are most vulnerable towards climate change⁷⁵. According to Eckstein et al.[8] catastrophic weather events between 1994 and 2013 resulted in up to 450 fatalities per year and an average economic loss of USD 3.99 billion. Drought (1997-2004 and 2013-2014), floods (2005, 2008, 2011, 2012 and 2013), the super flood of 2010 and 2022, and the greatest snowfall in the northern mountains (2005-2013) were among the extreme climate occurrences. Landslides, hurricanes (in 2007, 2010, 2013, and 2015), intense rainstorms, glacial lake outburst floods (GLOFs), and heat waves.⁷⁶ Because of the drastic climate change, every sector has been severely impacted. According to research by Parry⁷⁷ productivity and biodiversity are the most susceptible sectors globally. Several deaths and injuries were brought on by extreme weather.

Socioeconomic, agricultural, and community mobility losses are additional losses. The National Disaster Management Authority (NDMA) found that between 1994 and 2013 there was an average annual economic loss of USD 3.99 billion due to climate change in its first Intended Nationality Determined Contribution (INDC) research MOCC⁷⁸. The five floods that occurred repeatedly between 2010 and 2014 cost 18 billion USD in damages and had an impact on 38.12 million people. Flooding affected more than 10.63 million acres of agricultural land. Similar to this, the Centre for Disaster Philanthropy (2022) post-disaster

⁷³ C. S.-O. P. and P. C. C. 2011 "Review of climate change adaptation practices in South Asia," [Online]. Available: <http://dpanther.fiu.edu> (Accessed: Jul. 02, 2023)

⁷⁴ "J. M.-P. of the national academy 2007", . [Online]. Available: <https://www.pnas.org> (Accessed: Jul. 02, 2023)

⁷⁵ Eckstein et al. 2019 "Global climate risk index 2020,"

⁷⁶ Rehman et al , "Bulletin of the Atomic Scientists", vol. 72, no. 6, pp. 396–401, 2016.

⁷⁷ J.-E. Parry,(2016) "Review of current and planned adaptation action in Pakistan," , Accessed: Jul. 02, 2023. [Online]. Available: <https://idl-bnc-idrc.dspacedirect.org>

⁷⁸ Pak-IND (2022). [Online]. Available: <https://unfccc.int> (Accessed 23 June, 2023)

needs assessment states that the flooding resulted in infrastructure damages worth 14.9 billion USD, economic losses of 15.2 billion USD, and a need for humanitarian assistance of 18.20 million individuals. Flooding has devastated 8.2 million acres. It is critical to emphasise that there is little research on climate change adaptation, the suffering and loss that the country is experiencing in the current situation. In Pakistan, environmental degradation is an increasing issue and a non-traditional security threat.⁷⁹ Climate change is causing severe harm to Pakistan. Pakistan has implemented policies to address this, but more has to be done.

The effects of climate change have been felt everywhere on earth. To address the practical effects of climate change, adaptation policy implementation has received substantially less attention than mitigation policy implementation. In comparison to mitigation projects, adaptation-related projects are less common and given less attention globally.⁸⁰ The implications of climate change, which require policy adaptation, are just one of many related concerns that surround the evaluation of climate change policies.

In 2012, Pakistan presented its first climate change policy. The National Climate Change Policy (NCCP) was an initial step towards tackling climate change in the country. More than 120 policy initiatives from various fields are included in the proposal. A multi-sector policy called the NCCP offers mitigation and adaptation measures. The strategy puts a lot of emphasis on the development of sectors like forestry, agriculture, transportation, health care, and disaster preparedness. A big focus of the policy is focused on institutional development, capacity building, and technology transfer. Plans for regional and international cooperation, as well as inter-ministerial interaction, are also included in the policy. An NCCP with multiple sectors allows both adaptation and mitigation. The NCCP lists several important policy developments as well. To take advantage of global financial processes and the establishment of various financial organizations, for example, emphasises regional and international collaboration on climate change. One of the developing nations with such a

⁷⁹ M. A. Khan, et al, "The Challenge of Climate Change and Policy Response in Pakistan," *Environmental Earth Sciences*, vol. 75, pp. 1-16, 2016.

⁸⁰ G. Bachner, et al, "How does climate change adaptation affect public budgets? Development of an assessment framework and a demonstration for Austria," *Mitigation and Adaptation Strategies for Global Change*, vol. 24, pp. 1325-1341, 2019.

climate change policy is Pakistan. Additionally, it's crucial to assess the policy to ensure better application.

Similarly, there is a large data available on climate change policy, development aid and adaptation in poor countries.⁸¹ Bhavé et al.⁸² have written to support the climate change adaptation in the under developing countries. Bachner et al.[13] has discussed the mitigation projection and how they are addressed less seriously. How vulnerable is South Asia? It is important to note that Pakistan is most affected country towards climate change and draws attention to the less awareness of adapting and mitigating the effects of climate change policy⁸³. Another research carried out on the adverse effect of climate change on Pakistan, it ranks 135th in terms of global greenhouse gases but ranks 16th in terms of vulnerability to climate change. Eskstein et al.[8] briefly explains that in the GCRI that developing countries suffered more in terms of climate change as compared to the developed world. Many other researchers Morton [7] find out that the situation of the South Asian region has been worse than any other region⁸⁴. The implication of climate change and its effects on developing world like Pakistan are worse in terms of environmental and human security. The damages and climate change's negative consequences in Pakistan like the rise of temperature, heat waves, receding glaciers, and the lives of poor people of the country has become worse. [6]

There is a huge data available on the implications of climate change globally. Many reports and research papers are published in this context but most of them are described the impacts of climate change at the global level. Many researchers explained the impacts of climate change on developing and underdeveloped countries but there is very limited data on specific case studies of an under developing country like Pakistan.

3.2 ISLAMIC REPUBLIC OF PAKISTAN

Islamic Republic of Pakistan; general information, a brief overview of Pakistan's history, and politics and will be examined under the headings of the administrative structure.

⁸¹ C. Betzold and F. Weiler, "Development Aid and Adaptation to Climate Change in Developing Countries," Springer, 2018.

⁸² A. G. Bhavé, D. Conway, S. Dessai, and D. A. Stainforth, "Climate Risk Management," 2016.

⁸³ Hussain. M et al, "Energy and Environment", vol. 29, no. 2, pp. 184-203, 2018.

⁸⁴ M. A. Khan, J. A. Khan, Z. Ali, I. Ahmad, and M. N. Ahmad, "The Challenge of Climate Change and Policy Response in Pakistan," Environmental Earth Sciences, vol. 75, pp. 1-16, 2016.

Located in the southeast Asia, Pakistan is an independent country. With India on its eastern, Afghanistan and Iran on its western, and China on its northern border, the nation is bound by these countries as well. According to the latest recent figures from 2021, Pakistan has an estimated 233 million people, making it the sixth most populous nation in the world. One of Pakistan's largest cities, Karachi, is situated in the country's southern region close to the Arabian Sea. Pakistan has a surface area of 796,095 sq km, of which 25,220 are water-covered. 35.2% of the land in the agricultural nation of Pakistan is irrigated. The population is growing at a rate of 2.07% annually, with 36% of people aged 0 to 14 and 34% between 25 and 54. The majority of the educated male population has a literacy rate of 59%. ⁸⁵ Islam is the dominant religion in Pakistan, which has a majority of Muslims. Religion has a big impact on Pakistani society.

Table 3.1:Brief information about Pakistan

Capital	Islamabad	Independence Year	1947
Population	233,351,081 (233)	Religion	Muslim (official) 96.5% (Sunni 85-90%, Shia 10-15%), other (includes Christian and Hindu) 3.5%
Area	796,095 km ²	Head of State	Arif Alvi
Official Languages	Urdu English	Prime Minister	Shahbaz Sharif

Brief information about the country is given in the above table. According to these, the majority of the religion is Muslim (96.5), and the rest of the numbers are the minority (Hindu Christians and others). There are over 70 local languages still use in Pakistan. Urdu and English are generally official languages, and the most spoken local language in each

⁸⁵ "Pakistan - The World Factbook." <https://www.cia.gov/the-world-factbook/countries/pakistan/> (accessed Jul. 02, 2023).

province is also considered the third language [3]. Pakistan has a diverse climate, with hot, dry conditions in the south and frigid, mountainous conditions in the north. Four distinct seasons exist. (December to February) Winter (March through May) (June through September) Fall (October to November).⁸⁶

Pakistan has a complicated and hierarchical system of social stratification known as the caste system, which is based on occupation, genealogy, and religion. Although it is less rigorous, as compared to the caste system in India. Even though the government of Pakistan does not formally acknowledge the caste system, it continues to be a significant part of Pakistani society.⁸⁷

3.3 BRIEF HISTORY OF PAKISTAN

The area that is now Pakistan has a long and illustrious history. The Indus valley which is located in Pakistan is one of the earliest civilizations of the world. The region was dominated by several dynasties and kingdoms throughout the years, including the Maurya Empire, Gupta Empire, Islamic caliphates, Delhi Sultanate, and Mughal Empire.⁸⁸ Eventually, the British East India Company seized control of the Indian continent, including modern-day Pakistan, in the 18th and 19th centuries. Following the Indian Rebellion of 1857, direct British colonial administration over the area began in 1858. [88]. The desire for a distinct country for Muslims in the subcontinent gave rise to the Pakistan Movement, which was led by Muhammad Ali Jinnah, at the beginning of the 20th century. Under Jinnah's direction, the All-India Muslim League promoted the establishment of a sovereign Muslim state⁸⁹. On August 15, 1947, the British colonial era ended, as India and Pakistan became independent. Following the division of British India, two new countries were formed: India, which has the most Hindus, and Pakistan, which has the most Muslims. [89] West Pakistan, which includes the present-day nation of Pakistan, and East Pakistan, which includes the nation of Bangladesh today, once made-up Pakistan. Pakistan's early years were characterized by

⁸⁶ "Pakistan Meteorological Department. " [Online]. Available: <https://www.pmd.gov.pk/en/> (accessed Jul. 01, 2023).

⁸⁷ "Climate Change and Migration in Pakistan – The Diplomat".(2017) [Online]. Available: <https://thediplomat.com/2017/08/climate-change-and-migration-in-pakistan/> (accessed Jul. 01, 2023).

⁸⁸ L. Ziring, "Pakistan in the Twentieth Century: A Political History," 1997.

⁸⁹ A. Jalal, "The Sole Spokesman: Jinnah, the Muslim League and the Demand for Pakistan," Cambridge University Press, 1994.

difficulties with administration, economic growth, and the blending of many ethnic and linguistic groupings [89]. Over the years, Pakistan and India have fought various battles, notably the Indo-Pakistani battles of 1947–1948, 1965, and 1971 (It led to the separation of East Pakistan and the founding of Bangladesh.). Jammu and Kashmir's continuing dispute continues to be a sensitive subject. [90] In Pakistan, there have been periods of both civilian and military administration. Throughout the history of the nation, there have been several constitutional changes and political alterations.⁹⁰ In addition to socioeconomic problems, terrorism, sectarian strife, and regional geopolitical dynamics, Pakistan has had to deal with several other domestic and external concerns. Economic and social inequities have been addressed, and efforts have been made to deepen democracy and enhance governance.⁹¹

3.4 POLITICAL AND ADMINISTRATIVE STRUCTURE

A parliamentary democracy, the Dominion of Pakistan was established with a head of government (the Prime Minister) and a ceremonial head of state (the Governor-General). The interim constitution was based on the Government of India Act of 1935, with modifications made to fit the needs of the newly created state. Power was split between the federal government and the provinces in Pakistan.⁹² Pakistan became an Islamic nation in 1956 after adopting its first constitution. As head of state, the President took the role of the Governor-General. The Prime Minister retained his executive power in his position as head of state. The Constitution established a parliamentary system and a bicameral legislature. Following a military takeover in 1958, this constitution was annulled. [92] There were two periods of military control in Pakistan: from 1977 to 1988 under General Zia-ul-Haq and from 1958 to 1971 under General Ayub Khan. In military regimes, the military leadership had a disproportionate amount of authority, and democratic institutions were restricted. The country was governed by presidential decrees and martial law. President Zulfikar Ali Bhutto oversaw Pakistan's switch to a presidential government after East Pakistan's partition and the

⁹⁰J. Ferreira, "Book Review: Ian Talbot. 2015. Pakistan: A New History," SAGE Publications Sage India: New Delhi, India, 2016.

⁹¹ M. Ahmad & S. Akhtar, "Development of Insecticide Resistance in Field Populations of *Brevicoryne brassicae* (Hemiptera: Aphididae) in Pakistan," *Journal of Economic Entomology*, vol. 106, no. 2, pp. 954-958, 2013.

⁹² N. Islam, "Colonial Legacy, Administrative Reform and Politics: Pakistan 1947-1987," *Public Administration & Development*, vol. 9, no. 3, pp. 271, 1989.

creation of Bangladesh in 1971.⁹³ A unicameral National Assembly was constituted, and the President had substantial executive authority. Pakistan has mostly been governed under a parliamentary democratic system since 1988. The president is the chief of the state while the Prime Minister is in charge of the government. The President's role is mostly ceremonial, whereas the Prime Minister has executive responsibility. The National Assembly, which is the lower house, and the Senate, which is the upper chamber, make up Pakistan's bicameral legislature. The provinces contribute to a federal system by having their own legislative bodies and chief ministers. [93]

Information on the general, historical, political, and administrative structure of Pakistan is briefly presented. Security concerns about Pakistan will be addressed in the next section.

3.5 PAKISTAN AND SECURITY CONCERNS

Pakistan's domestic and regional dynamics have been affected by a variety of security concerns ⁹⁴. While the opening of the political sphere to new social groups deepened democracy in Pakistan, violent political disintegration has created obstacles to policymaking. In the territory that Pakistan occupies; it is exposed to security threats caused by unstable and weak states such as Afghanistan, Iran, and India. In addition, Pakistan and India have a complicated relationship, and the ongoing conflict over the Jammu and Kashmir area has long been a source of hostility between the two countries. [94] Although persistent structural issues are the cause of Pakistan's severe economic challenges. ⁹⁵ It is experiencing internal and external security challenges that may increase even more in the coming years. Pakistan and security issues will be examined in two categories: internal security issues and external security issues.

3.5.1 Internal Security Issues

Due to its strategic location on the international map, Pakistan has experienced several security issues. Pakistan is currently dealing with several issues that pose a constant threat

⁹³ M. Z. I. Jadoon & N. Jabeen, "Administrative Reforms in Pakistan," in *Public Administration in South Asia*, Routledge, 2017, pp. 439-451.

⁹⁴ I. Basit, et al "Religious Extremism in Pakistan: A Review Paper," *PalArch's Journal of Archaeology of Egypt/Egyptology*, vol. 18, no. 10, pp. 1791-1800, 2021.

⁹⁵ A. Arsianti, "Recent Economic Developments, Outlook, and Risks" [Online]. Available: www.shutterstock.com. (Accessed: Jul. 02, 2023)

to its security arrangements, such as the environment, drug trafficking, terrorism, separatist movements, disarmament, the spread of Weapons of Mass Destruction (WMDs), and personal and legal issues relating to gender.⁹⁶ Internal security challenges to Pakistan are primarily influenced by factors including ethnicity, sectarianism, and economic instability. The negative effects of religious extremism have left Pakistan with a poor reputation in the eyes of the rest of the globe. Interprovincial disputes might also possibly do considerable harm to the federation. Despite recent economic growth and prudent macroeconomic policies, Pakistan's lack of true socioeconomic progress has given regional powers and ethno-sectarian actors a pretext to abuse the country and weaken its internal defences. This contends that ethnic and religious conflicts pose serious security risks to Pakistan and continue to a big obstacle to the country's aspirations for economic progress. This approach focuses on the interdependence of these diverse threats and how they affect internal security.⁹⁷ Following are the three main internal security issues of Pakistan.

Insurgency in Baluchistan: Baluch nationalist parties have been fighting for more political autonomy, resource rights, and redress for perceived discrimination for a long time in the region of Baluchistan. Baloch militant organizations, notably the Baluchistan Liberation Army (BLA) and Baloch Republican Army (BRA) have committed violent crimes, attacking security personnel, elected officials, and public property. Enforced disappearances, extrajudicial murders, and claims of human rights violations by both rebels and security personnel have all been characteristics of the insurgency.⁹⁸

Sectarian Violence: Between various religious and sectarian groupings, particularly Sunni and Shia populations, there have been problems in Pakistan. Sectarian violence has caused many fatalities and widened socioeconomic gaps, including targeted assassinations, bombs at religious events, and attacks on houses of worship. Theological disagreements, political rivalries, and outside forces all contribute to sectarian conflict.⁹⁹

⁹⁶ Z. Yaseen & M. Muzaffar, "Extremism in Pakistan: Issues and Challenges," *Journal of Politics and International Studies*, vol. 4, no. 1, pp. 31-42, 2018.

⁹⁷ I. Khalid, "Restructuring the Image of Pakistan: Internal Challenges and External Pressures," *Dialogue*, vol. 8, no. 1, p. 18, 2013.

⁹⁸ B. Zahoor and R. Rumi, "Rethinking Pakistan: A 21st Century Perspective," Anthem Press, 2020.

⁹⁹ M. Q. Zaman, "Sectarianism in Pakistan: The Radicalization of Shi 'i and Sunni Identities," *Modern Asian Studies*, vol. 32, no. 3, pp. 689-716, 1998.

Ethnic and political unrest: Ethnic tensions and political unrest have periodically surfaced in several regions of Pakistan, including Sindh, Khyber Pakhtunkhwa, and Gilgit-Baltistan. Protests, strikes, and even violent outbursts have been sparked by grievances about political representation, resource allocation, and identity concerns. [97]

3.5.2 External Security Issues

Pakistan is countering with regional security concerns in many areas since its inception. There were various elements that made the country unstable (threatened) state, which not only generated difficulties for leadership but also a scared atmosphere among the populace, and the Pakistani State is currently facing significant difficulties. Protracted disputes among South Asian states are another source of Pakistan's instability. ¹⁰⁰

Indo-Pak conflict: The historical animosity between Pakistan and India, as well as India's power projection in the area, render Pakistan susceptible, while Sino-Indian competition makes A battleground is Pakistan. India is always hatching schemes and interfering in Pakistan to sow unrest and forward its agenda of demonizing Pakistan as a failed state and heaven for terrorists. India's backing of Baloch militants is meant to prevent China from accessing the deep sea through Gwadar Port ¹⁰¹Kashmir issue: Because Pakistan is an agricultural country and Kashmir is its watergate, India has seized Pakistan's jugular vein since its independence in 1947. In 1948, Pakistan and India had war over Indian side of Kashmir. "India has completed its dam constructions, which may permanently harm Pakistan's agricultural industry, precipitating the worst economic disaster in the country's history. ¹⁰² Indian violence and savagery could not be found in any other part of the world; hence India turned a paradise into a hell. This factual research, which states that "from 1989 to June 30, 2010, there have been 93,274 deaths of innocent Kashmiris," gives an idea of human rights violations that are occurring in Indian-occupied Kashmir. In addition to the horrifying number of open executions carried out by its security personnel, there have been 6,969 deaths in custody, 117,345 arrests, and 105,861 homes and other physical structures

¹⁰⁰ M. S. Malik & H. U. Khan, "Regional Security Threats to Pakistan: A Critical Review," *Pakistan Journal of History and Culture*, vol. 39, no. 2, pp. 159-175, 2018.

¹⁰¹ S. Bose, "Kashmir: Roots of Conflict, Paths to Peace," Harvard University Press, 2005.

¹⁰² W. A. Qureshi, "Water as a Human Right: A Case Study of the Pakistan-India Water Conflict," *Penn St. JL & Int'l Aff.*, vol. 5, p. 374, 2017.

demolished or destroyed for communal use ¹⁰³. The three Indo-Pakistani confrontations (1947-48, 1965, and 1971) were all distinguished by a low level of violence, a narrow scope, and a brief length. The present resurgence of violence in Kashmir is unlikely to result in another full-scale conflict between India and Pakistan because, strangely, the region's impending nuclearization has introduced a modicum of stability at greater levels of violence.¹⁰⁴ Pak-Afghan border; The major issue in the conflict between Pakistan and Afghanistan is the legal status of the Pakistan-Afghanistan border. The withdrawal of NATO troops from Afghanistan in December 2014, there was a lack of leadership and political instability, which could compromise regional security, particularly in Pakistan.¹⁰⁵ The Pakistan-Afghanistan border is delicate; thus, it must be managed to ensure the long-term stability of the two countries and the region. However, there are still certain problems with the border's legal and historical features, with the Pashtun Community of Afghanistan's perspective, they will be separated from their Pashtun relatives.¹⁰⁶ Two different perspectives on each side of the border have shaped this relationship: Pakistan wants a friendly Kabul government to prevent the Pak-Afghan border from becoming a hotbed of chauvinistic and jingoistic Pashtun nationalism, while Kabul wants to use the border to advance its interests by questioning its legitimacy. ¹⁰⁷ Securing its western border, while on the other hand its eastern border is already under attack from threats and dangers. Pakistan's main objective in establishing a favourable administration in Kabul. The idea of strategic scope or seeking refuge in Afghanistan in the event of an Indian army strike, is another issue that worries Pakistan. Strategic depth has not yet been beneficial to Pakistan; on the contrary, it has almost always had the opposite impact. ¹⁰⁸ It was frequently utilized by Afghanistan to conduct terrorist operations in Pakistan before seeking refuge in the mountains and then

¹⁰³ R. Moorthy, H. K. Sum, & G. Benny, "Power Asymmetry and Nuclear Option in India-Pakistan Security Relations," Asian Network for Scientific Information, 2015. [Online]. Available: <https://doaj.org/toc/1992-1454>.

¹⁰⁴ R. Paris, "Human Security: Paradigm Shift or Hot Air?," International Security, vol. 26, no. 2, pp. 87-102, 2001.

¹⁰⁵ J. Khalil, et al, "Afghanistan's Political and Economic Condition: An Appraisal of Likely Situation at NATO-Drawdown," FWU Journal of Social Sciences, vol. 1, no. 1, p. 2.6, 2015.

¹⁰⁶ Z. U. A. Malik & H. Zhilong, "Present Scenario of Central Asia with respect to Pakistan and Afghanistan in the Light of Security Challenges," International Journal of Political Science, vol. 4, no. 1-4, 2018.

¹⁰⁷ S. Afzal, et al, "Terrorism and Extremism as a Non-Traditional Security Threat Post 9/11: Implications for Pakistan's Security," International Journal of Business and Social Science, vol. 3, no. 24, pp. 194-203, 2012.

¹⁰⁸ Z. U. A. Malik, et al, "Terrorism: The Biggest Security Challenge to the Integrity of Pakistan," Orient Research Journal of Social Sciences, vol. 4, no. 1, pp. 96-106, 2019.

returning to Afghanistan. This was clear in several instances, such as the attack on the Army Public School in Peshawar, where it was claimed the culprit had sought asylum in Afghanistan.¹⁰⁹

Pakistan's internal and external security issues are generally stated. All these security problems are intertwined. A security problem can trigger or increase another security problem. In this sense, the problem of climate change will also affect many points in terms of Pakistan's internal affairs, and regional and external terms of security problems. In the next section, the effect of climate change on Pakistan will be examined.

3.6 EFFECTS OF CLIMATE CHANGE ON PAKISTAN

The IPCC's 5th Assessment Report reiterated that climate change is real, and its effect is immediately necessary to limit the atmospheric density of greenhouse gases. Reduction means a shift from the current energy system to a fundamentally different non-carbon energy system and this change requires cost. The cost of reducing greenhouse gas emissions prevents many governments from investing to accelerate efforts required to combat climate change. There is a global issue with climate change mitigation, but the effects will vary by region. The Global Climate Risk identified Pakistan as the fifth most climate change-vulnerable nation. (GCRI). According to the GCRI Pakistan is the 5th most effected state towards climate change.¹¹⁰ The geographical location of Pakistan in the region where it is situated is will have severe consequences of climate change.¹¹¹ In this sense, in this section, first, the predicted changes in Pakistan's climate change and their effects on the ecosystem will be examined. Then the effects of all these changes on social and economic systems will be examined.

3.6.1 Projected Climate Change And Its Effects On The Ecosystem

Under the following headings, the impacts of global climate change on Pakistan's ecosystem will be discussed.

¹⁰⁹ M. A. Muzafar, "Terrorism in South Asia: Anatomy and the Root Causes," *Journal of Humanities and Social Sciences*, vol. 20, no. 1, pp. 1-7, 2015.

¹¹⁰ D. Eckstein, M.-L. Hutfils, and M. Wings, "Global Climate Risk Index 2019: Who Suffers Most from Extreme Weather Events," p. 36, 2018.

¹¹¹ C. B. Field & V. R. Barros, "Climate Change 2014 – Impacts, Adaptation and Vulnerability: Regional Aspects," Cambridge University Press, 2014.

Temperature changes: Pakistan is the country where the temperature rises dramatically each year. In contrast to June, when the average maximum temperature is 36°C, the year maximum temperature is roughly 27°C. High temperatures can generate heat waves, which often result in fatalities. In Karachi alone, about 700 people died from heat strokes in 2015, and roughly 1200 people died in Pakistan as a result of heat waves. Pakistan saw more than 136 extremely hot periods between 1997 and 2021.¹¹² Agriculture suffers from heat waves because they destroy crops, animals, people's health, and forests. For countries like Pakistan, it further dries out the land, where agriculture is the major source of revenue. Heat waves have an impact on food safety and security in Pakistan. Crops begin to rot in some areas, while in others, the harvesting season is pushed forward. [107]

Sea level changes: Pakistan is the country where the change in weather is due to rising sea levels. According to a research report from Pakistan¹¹³ the sea level is rising by around 1.1 millimetres each year. Because around ten percent of country's population lives along the shore, rising sea levels have a direct impact on them. Many coastal areas, such as Soomar, are losing land as sea levels rise. To prevent erosion, the government built a wall along the shore in the 1990s. The Pakistani government hasn't done much to prevent coastal erosion since then. Residents of coastal communities often turn to fishing when they lose their land to rising sea levels. This puts aquatic life in jeopardy and leads to the extinction of several fish species. Fishing is their sole source of income, but because of overfishing, which puts some fish species at risk of going wiped out, the government has banned fishing in certain marine areas. People in Pakistan who live along the coast in are impoverished, illiterate, and have health and financial issues. People were compelled to leave coastal communities in pursuit of employment, schools, and adequate health care due to coastal erosion and a fishing prohibition.¹¹⁴

Droughts: Droughts in Pakistan have become more frequent, linger longer, and are more severe because of climate change and overuse of water resources. [58] Three times in the past ten years, drought has been the most common natural hazard in Pakistan. A succession

¹¹² Ashraf Hussain et al, "Climate Change and Its Impacts on Pakistan," *Journal of Positive School Psychology*, vol. 6, no. 8, pp. 9195-9217, 2022.

¹¹³ F. A. Khan, et al, "Complex Extreme Sea Levels Prediction Analysis: Karachi Coast Case Study," *Entropy*, vol. 22, no. 5, p. 549, 2020.

¹¹⁴ M. Rabbani, et al, "The Impact of Sea Level Rise on Pakistan's Coastal Zones—In a Climate Change Scenario," in *Proceedings of the 2nd International Maritime Conference, Karachi, Pakistan, 2008*, pp. 25-27.

of severe floods has affected Punjab and Baluchistan since 2000. Droughts are quite likely for those who live in deserts. The Thar Desert is experiencing severe drought, which has resulted in starvation. As a result, many individuals have perished, and newborns are becoming ill due to a shortage of food. Animals are harmed by drought in different ways. People of Thar and Cholistan deserts are dealing with intense heatwaves and water shortages because of insufficient rainfall. Droughts that endure for an extended period leave people without adequate water or food, and they harm agriculture by decreasing crop yields and killing animals and humans.¹¹⁵

Melting glaciers: Melting glaciers have a huge influence on Pakistan, reducing freshwater supplies, and agriculture, and contributing to floods. Here are some of the effects of melting glaciers on Pakistan: Glaciers are an important source of freshwater for Pakistan, supplying water to agriculture, industry, and its people. However, increasing glacier melting is diminishing the country's freshwater supply, which might have dire consequences for the country's water security. [115] Glacier meltwater flows into rivers, giving drinking water for humans and animals as well as irrigation water for crops. Reduced freshwater availability due to melting glaciers might result in water shortages, which can harm agricultural and food security in Pakistan. [115] Flooding in Pakistan is being exacerbated by melting glaciers. Pakistan has approximately 7,200 glaciers, and rising temperatures related to climate change are causing many of them to melt quicker and sooner, adding water to already bloated rivers and streams.¹¹⁶ Melting glaciers can also result in the creation of glacial lakes, which can rupture and generate flash floods.¹¹⁷

Flood raids: There have been more floods in Pakistan in recent years. Monsoon rains cause the majority of floods in Sindh and Punjab. In KPK, Baluchistan, and Gilgit Baltistan—all hilly regions—hill torrent flooding is the most prevalent. Due to monsoon rains, the majority of floods happen around the end of summer. However, certain floods can occur as a result of high temperatures that force glaciers to break. Various aspects of the economy, infrastructure,

¹¹⁵ S. Ali et al., "Future Climatic Changes, Extreme Events, Related Uncertainties, and Policy Recommendations in the Hindu Kush Sub-regions of Pakistan," *Theoretical and Applied Climatology*, vol. 143, pp. 193-209, 2021.

¹¹⁶ Pakistan flooding: (2022). "How melting glaciers fuelled the disaster" -[Online]. Available Vox." <https://www.vox.com>

¹¹⁷ Zaman, (2022, July.). "In the mouth of dragons': Melting glaciers threaten Pakistan's north" [Online]. Available <https://phys.org>

agriculture, and lives of people are negatively impacted by floods. Massive flooding decimated Pakistan in 2010. Numerous people were slain, and their homes, crops, and animals were all destroyed. Another Chenab River flood in 2015 caused property destruction and hundreds of fatalities in Pakistan. Only three days of rain in August 2020 caused considerable damage. There were many fatalities, as well as numerous injuries and the destruction of homes, cattle, and crops. The floods affected 33 million people, with over 1,730 people killed. Floodwaters are still standing in many regions, which is permitting the development of water-borne and vector-borne diseases, and the situation is continuing to develop. The floods disproportionately hit the poorest and most vulnerable districts. The floods have resulted in about USD 30 billion in economic damage and over USD 16 billion in reconstruction costs. The floods had a long-term impact on Pakistan, which is still rebuilding from the devastation inflicted by the floods.¹¹⁸

3.6.2 Effects Of Climate Change On Social And Economic Systems

The effects of climate change on social and economic systems will be examined under the headings of agriculture, food security, water security, energy security, health and humanitarian security, economic development and growth, migration, and conflict.

Agriculture: Climate change is having a substantial influence on Pakistani agriculture, altering crop production, water supplies, and food security. Here are a few examples of how climate change is influencing agriculture in Pakistan:

Climate change is altering land usage and land cover, causing agricultural patterns to shift. Growers may switch from traditional crops to ones that adapted to climate change.¹¹⁹ Growth in agricultural water demand poses a danger to Pakistan's water resource management. Droughts, floods, warming, and changes in precipitation all have a direct influence on agricultural productivity. Only a few crops, such as wheat and barley, are more resistant to climate change.¹²⁰ Pakistan's economy is largely agrarian and dependent on

¹¹⁸ "Pakistan New Assessment" (Oct. 2022): "Flood Damages and Economic Losses Over USD 30 billion and Reconstruction Needs Over USD 16 billion" [Online]. Available <https://www.worldbank.org>.

¹¹⁹ U. Mustafa, et al, "Impacts of Climate Change on Agricultural Sector of Pakistan: Status, Consequences, and Adoption Options," in *Emerging Challenges to Food Production and Security in Asia, Middle East, and Africa: Climate Risks and Resource Scarcity*, 2021, pp. 43-64, Springer.

¹²⁰ M. A. Imran, et al, "Impact of Climate Smart Agriculture (CSA) practices on cotton production and livelihood of farmers in Punjab, Pakistan," *Sustainability*, vol. 10, no. 6, p. 2101, 2018.

agriculture, which generates 19.2% of the nation's GDP. Agricultural countries are particularly vulnerable to climate change since it frequently encounters extreme weather conditions like flooding, droughts, and heatwaves.¹²¹ Climate change generates novel agricultural, cultivation, and human and animal disease patterns, posing new threats to food security, safety, and human health.¹²² The main climatic factors that will strain agriculture include rising temperatures in fertile places, altered heavy dew, and the increased frequency and intensity of severe weather events such as floods and droughts, and heatwaves.¹²³ Climate change thus has a significant impact on Pakistani agriculture, changing crop yields, water supplies, and food security.

Food security: Climate change has had a substantial influence on Pakistan's food security, influencing agricultural production, water resources, and human health. Here are some ways in which country's food security is harmed by climate change. Climate change is often regarded as the main source of food insecurity in Pakistan. Temperature, rainfall, water availability, and population expansion have all contributed to a shortage of food output and a rise in food costs.¹²⁴ In Pakistan, the disastrous impacts of climate change have resulted in increased food insecurity. Fifty percent of the country's population is food insecure, and the condition is anticipated to deteriorate because of climate change.¹²⁵ Climate change generates novel agricultural, cultivation, and human and animal disease patterns, posing new threats to food security, safety, and human health. [123] Climate change is a significant threat to country's food supply. Himalayan glaciers, which provide the country's main water source (the Indus Basin), have lost more mass since 2000 than the previous century. The retreat of glaciers can cause water scarcity, which can harm agriculture and food security in Pakistan.¹²⁶ Climate change reduces agricultural production, increasing food insecurity and

¹²¹ M. A. Weiss, "Asian infrastructure investment bank (AIIB)," Congressional Research Service, Washington, DC, 2017.

¹²² R. Menhas, et al, "Climate change and its impact on food and nutrition security in Pakistan," Iranian journal of public health, vol. 45, no. 4, pp. 549-550, 2016.

¹²³ S. Ullah, "Climate change impact on agriculture of Pakistan-A leading agent to food security," International Journal of Environmental Sciences & Natural Resources, vol. 6, no. 3, pp. 76-79, 2017.

¹²⁴ Javed Ahmad.(2022), , "CENTRE FOR STRATEGIC AND CONTEMPORARY RESEARCH NSP and Climate-Smart Agriculture in Pakistan, " [Online]. Available: <https://cscr.pk>

¹²⁵ Raza Abbas, "Food security," (2022, Sep.). [Online]. Available <https://www.nation.com.pk/20-Sep-2022/food-security> (accessed Jul. 02, 2023).

¹²⁶ Shahroo.(Aug. 2022) , "Climate Change and Food Insecurity in Pakistan – South Asian Voices," <https://southasianvoices.org> (accessed Jul. 02, 2023)

harming Pakistan's export business.¹²⁷ Severe heat waves and late rains have also had a negative influence on Pakistan's agricultural productivity, resulting in lower crop yields and food production. [127] Severe heat waves and late rains have also had a negative influence on Pakistan's agricultural productivity, resulting in lower crop yields and food production.

Water security: Climate change is having a substantial influence on Pakistan's water shortage, altering water supplies, water quality, and human health. Here are some examples of how Pakistan's water shortage is being impacted by climate change: Climate change has a deep impact on country's water resources since it impacts glacier behaviour, rainfall patterns, greenhouse gas emissions, biodiversity recurrence, watershed eco-degradation, and global glacial loss. Pakistan is among the most water-stressed countries in the world, with yearly water availability per person declining from 5140 m³ in 1950 to 1000 m³.¹²⁸ Climate change is creating exceptional heatwaves and droughts in Pakistan, followed by unusual rains and floods during the monsoon season, altering the country's water supply, consumption, and storage.¹²⁹ Growth in agricultural water demand poses a danger to Pakistan's water resource management. Droughts, floods, warming, and changes in precipitation all have a direct effect on agricultural production, influencing water supplies.¹³⁰ Climate change is changing the quality of water in Pakistan, posing health dangers to the people. Droughts and floods induced by climate change can contaminate water, which can be harmful to human health. [130] Thus, climate change is negatively affecting country's water supply, water quality, and human health, where there is a severe water deficit.

Energy security: Energy use and production are directly impacted by climate change, both locally and globally. The primary effect of climate change is an increase in energy consumption in homelands, workplaces, and industries for activities such as cooling enclosed spaces as temperatures rise, cooling industrial processes and refrigerators, pumping water for municipal and agricultural irrigation, and so on. The availability of energy and the types of fuels used, such as natural gas for heating and electricity for air conditioning, are

¹²⁷ Shuja. "Climate change and food security paradigms in Pakistan," (Aug.2022).
<https://tribune.com.pk/story> (accessed Jul. 02, 2023).

¹²⁸ M. Hussain & S. Mumtaz, "Climate change and managing water crisis: Pakistan's perspective," *Reviews on Environmental Health*, vol. 29, no. 1-2, pp. 71-77, 2014.

¹²⁹ W. Ishaque, et al, "Climate Change and Water Crises in Pakistan: Implications on Water Quality and Health Risks," *Journal of Environmental and Public Health*, vol. 2022, 2022.

¹³⁰ J. Y. William, et al, "Pakistan: Getting More from Water," World Bank: Washington, DC, USA, 2019.

also impacted. Three steps must be taken, according to Martin et al. to attain energy security.¹³¹ According to studies by the National Economy Environmental Development, Pakistan used 37.3 million tons of net energy in 2008. Energy needs were met by the use of gas (43.4%), oil (29%), electricity (91.53%), coal (10.4%), and LPG (1.5%). Together, these energy sources are responsible for 51% of the nation's greenhouse gas emissions. The use of petroleum has been increased by 0.5% annually over the last 10 years. Gas consumption has climbed by 9% during the last five years, coal consumption has increased by 1.5%, and oil consumption has fallen by 9.5%. Pakistan's energy security may be threatened by climate change, which could cost the nation more than 9% of its annual GDP. [127]

Health and Human Security: Heat-related disease and mortality are significant issues in Pakistan. The elderly are at risk. According to WHO, the number of fatalities due to heat among adults 65 and older increased from 10 per 100,000 to almost 63 per 100,000 in 2016. Energy sources are to blame for both climate change and local air pollution. Lung cancer, respiratory infections, and other heart issues may cause more local and global deaths as a result of air pollution.¹³² Using solid fuels indoors contaminates the air. These solid fuels are used to cook in 93% of Pakistani homes, while firewood provides the majority of the country's 91% of heating needs. [115] Approximately 326,000 people are killed by indoor air pollution each year¹³³ as a result of indoor air pollution women and children are more likely to become sick because they spend more time at homes. Due to indoor air pollution, more than 34,000 kids lose their lives to acute lower respiratory infections each year. [134]

Climate change also effect the mental health of those who relocate ¹³⁴ Diseases carried by insects and water induced by temperature and rainfall variations harm pregnant and breastfeeding women. Because of climate change, they are having problems with cleanliness, health, and sanitation.

¹³¹ S. Malik, et al "Energy security in Pakistan: A quantitative approach to a sustainable energy policy," ADBI Working Paper Series, 2019.

¹³² R. Somani, "Global Warming in Pakistan and Its Impact on Public Health as Viewed Through a Health Equity Lens," International Journal of Social Determinants of Health and Health Services, vol. 53, no. 2, pp. 154-157, 2023.

¹³³ "World Health Organization" (2022). [Online]. Available: <https://www.who.int> (accessed Jul. 01, 2023).

¹³⁴ V. M. Cvetković and L. Grbić, "Public perception of climate change and its impact on natural disasters," Journal of the Geographical Institute "Jovan Cvijić" SASA, vol. 71, no. 1, pp. 43-58, 2021.

Economic Development and Growth: Climate change has had a substantial influence on Pakistan's economic development and growth, impacting GDP, productivity, and sustainability. Here are some ways that climate change is harming country's economic growth and development. Climate change has an enormous effect on GDP and productivity across sectors, including agriculture, industry, and services.¹³⁵ Climate change is causing an economic imbalance in Pakistan, with certain economic sectors rising faster than others¹³⁶ Climate change is having an impact on economically critical areas such as agricultural production, the environment, fisheries, and human health, which can harm the country's economic development. [136] Pakistan would lose \$19.5 billion in real GDP as a result of reduced wheat and rice crop yields by 2050¹³⁷. Climate change is estimated to cost Pakistan up to \$3.8 billion in yearly economic losses over the next two decades, with temperatures rising by up to 2.5 degrees Celsius. Climate change is impacting the availability, use, and storage of water in Pakistan, which might harm the country's economy and force millions of people to relocate. [130] Climate change thus has significant effect on Pakistan's economic growth and development, affecting the nation's GDP, productivity, and sustainability.

Migration and conflict: In Pakistan, there is a substantial group of individuals who have relocated there from other regions of the country. These refugees and internally displaced person (IDPs) are significantly impacted by climate change. The majority of the people fetch up in rural areas. They do not have adequate, shelter, medical facilities, work, or food security. In Pakistan, climate change has had a substantial influence on migration and conflict, hurting communities, women, and vulnerable groups. Here are a few examples of how climate change is influencing migration and violence in country. Climate change is causing migration and violence in many regions of the world, and it is becoming a possibility in Pakistan.¹³⁸ Pakistani populations, particularly women, are becoming increasingly exposed to disaster-caused relocation, resulting in climate migration. Floods and heat stress are the primary causes of climate change-induced migration in Pakistan, forcing people to

¹³⁵ N. Akram & A. Hamid, "Climate change: A threat to the economic growth of Pakistan," *Progress in Development Studies*, vol. 15, no. 1, pp. 73-86, 2015.

¹³⁶ Adil, "Economy - Strafasia | "Strategy, analysis, News and insight of Emerging Asia". [Online]. Available: <https://strafasia.com>

¹³⁷ N. Khurshid, et al , "Impact of climate change shocks on economic growth: A new insight from non-linear analysis," *Frontiers in Environmental Science*, vol. 10, 2022.

¹³⁸ F. Ali, et al "Climate change-induced conflicts in Pakistan: from national to individual level," *Earth Systems and Environment*, vol. 2, pp. 573-599, 2018.

relocate either temporarily or permanently. [87] Climate catastrophes are anticipated to displace around 2 million people in Pakistan by 2050, and even with emission reductions, 600,000 people would be affected by climate events by 2030.¹³⁹ As migrants compete for limited resources, climate-induced migration in Pakistan can lead to disputes over resources such as water and land. [115] Climate change consequently harms communities, women, and vulnerable groups while having a significant impact on migration and conflict in Pakistan.

3.7 PAKISTAN'S CLIMATE CHANGE POLICIES

An economically suffering country Pakistan had taken several policy measures to tackle climate change. Having a small contribution in GHG emissions, Pakistan is one of the top countries, which is impacted by climate change, according to the Global Climate Risk Index.¹⁴⁰ Despite accounting for less than 1% of global greenhouse gas emissions, it has grown over time. Pakistan's CO₂ emissions in 2021 were 219.8 million tonnes, the highest amount in the country's history. [141] In the first section, Pakistan's rhetoric on climate change will be mentioned chronologically. Then the national action plan for the solution to climate change and its supportive policies will be examined. Finally based on the climate change policies its implements Pakistan's perception of security will be evaluated.

Climate change institutionalization in Pakistan has begun with early environmental activities reaching back to the mid-1970s. Between 1971 and 2001, Pakistan recognized and signed 14 international environmental agreements, including the Kyoto Protocol and the UNFCCC on Climate Change, which acted as impetuses for the nation's climate change policy procedures and actions. Establishing institutional frameworks to direct the nation's environmental endeavours has made significant development. However, after more than four decades, these initiatives remain scattered, with little coordination, political backing, and ownership.

Following the adoption of The Ministry of Environment was moved to the provinces as part of the 18th constitutional revision in 2010, and a new Ministry of Disaster Management was formed in 2011. In 2012, it was renamed the Ministry of Climate Change, elevating it to cabinet-level status. Climate Change lost its ministerial position in 2013 and was reduced to

¹³⁹ "Hunter Mary Pakistan and the Historic 'Loss and Damage' Deal - Centre for Strategic and Contemporary Research, " (2022, Dec.). [Online]. Available: <https://cscr.pk>

¹⁴⁰ UNFCCC (2021). "The National Climate Change Context National Vision For Climate Action". [Online]. Available: <https://unfccc.int>

a division of the Cabinet Secretariat, where it stayed until early 2015. Table 3.2 summarizes Pakistan's institutionalization of the environment and/or climate change.



Table 3.2: Brief History of Pakistan's Institutionalization of climate change

Year	Accomplishment	Purpose/ Function
1995	Cabinet Committee on Climate Change established	Acted as policy coordination forum for climate change
1997	Pakistan Environmental Protection Act enacted	First environmental act of the country
2002	Global Centre for Impact Studies on Climate Change established	This research centre on climate change functioned for 10 years as a development project
2004-2005	Prime Minister Committee on Climate Change Convenes National Environment Policy	Includes Prime Minister, Ministry of Water and Power, Food and Agriculture, Science and Technology, Environment, Planning Commission, Special Adviser to the Prime Minister
2006	National Energy Conservation Policy National Renewable Energy Policy Clean Development Mechanism National Operational Strategy	
2010	18th Amendment to the 1973 Constitution	Devolution of power to the provinces
2011	Ministry of Environment ceases to exist. The New Federal Ministry of Disaster Management established	Functions transferred to the Planning Commission
2012	Ministry of Disaster Management renamed to the Ministry of Climate Change National Climate Change Policy approved by Federal Cabinet Punjab and Balochistan Environmental Protection Act was prepared and enacted. “Green Benches” established in all High Courts and the Supreme Court of Pakistan by the Chief Justice of Pakistan National Disaster Management Plan approved. National Sustainable Development Strategy	Elevate climate change issues to a cabinet-level portfolio. A dedicated policy on climate change Deals with environmental cases; 2013 decision priorities environmental cases in High Court
2013	Ministry of Climate Change downgraded to Division of Climate Change Global Climate Change Impact Studies granted autonomous status. National Disaster Risk Reduction Policy approved	Becomes part of the Cabinet Secretariat Serves as the Secretariat for the Prime Minister Committee through “GCISC Act 2013
2014	Framework for Implementation of Climate Change Policy Adopted	
2015	The Division of Climate Change was renamed the Ministry of Climate Change.	Federal focal ministry on all climate change-related issues

¹⁴¹. A single institution's repeated shifts in status and policy emphasis send two meanings. First, significant policymakers and decision-makers are becoming more aware of the interconnectivity and interconnection of environmental concerns, starting with disaster management. The larger picture of climate change is another factor. This notion is supported by the consistent improvement in how climate change is conceptualised in major policy papers such as the Poverty Reduction Strategy Paper-II (2009), Framework for Economic Growth (2011), and the Economic Survey of Pakistan (2012–2014). Second, it suggests a reactive and fragmented approach to addressing environmental and climate change concerns, with no precise plan of action. This worries important policymakers when it comes to linking and separating the two issues, which can be linked back to the primary policy document. For example, since 2012, the Economic Survey of Pakistan (published by the Ministry of Finance) has acknowledged Climate Change Policy, although under the environment section.

The Pakistan Environmental Protection Ordinance (PEPO), Pakistan's first comprehensive environmental law, was adopted in 1983. It also created the Pakistan Environmental Protection Council (PEPC) and the Federal and Provincial Environmental Protection Agencies (EPAs). PEPO was eliminated in 1997 by the Pakistan Environmental Protection Act (PEPA). A national conservation strategy's implementation framework, provincial sustainable development funds, environmental tribunals, environmental magistrates for these, and the first environmental examination (EIA) were all formed by the PEPA.

At the federal and provincial levels, there are existing EPAs and councils. The PEPC, which has 35 members, including province chief ministers, is headed by the prime minister.¹⁴²

3.8 PAKISTAN'S ACTION PLAN FOR CLIMATE CHANGE

The main source of information for Pakistan's framework for a climate change policy is the NCCP. ¹⁴³The process of creating the nation's first climate change policy was launched by the Ministry of Environment in early 2011 in collaboration with UNDP Islamabad. After extensive consultation, it took about 1.5 years to develop the policy. It was approved by the Federal Cabinet in September 2012, and the newly created Ministry of Climate Change

¹⁴¹ I. Ahsan and S. Amin Khawaja, "Development of Environmental Laws and Jurisprudence in Pakistan" 2013, Accessed: Jul. 02, 2023. [Online]. Available: www.adb.org

¹⁴² A. Kundi, "Toothless Pakistan Environmental Protection Council," *Pakistan Today*, vol. 6, 2011.

¹⁴³ GOPMCC "NCCP" (2021) [Online]. Available: <https://mocc.gov.pk> (accessed Jul. 02, 2023)

began operations in February 2013. The main Objectives of National Climate Change Policy 2012 (NCCP) can be mentioned as follows:

- a. To achieve long-term economic growth while addressing climate change-related challenges.
- b. Integrating national policy on climate change with other related challenges.
- c. To prioritise pro-poor, gender-sensitive adaptation while encouraging mitigation to the greatest degree practicable and economically feasible.
- d. To construct climate-resilient infrastructure.
- e. Monitor how the country's water, food, and energy security is affected by climate change and develop corrective actions to support water, energy, and food policies.
- f. To lessen the risks brought on by an increase in the occurrence and intensity of extreme weather conditions such as floods, droughts, and tropical storms.
- g. To develop agricultural and food systems that are climate resilient across the whole agroecological zone of the nation.
- h. To promote the nation's shift to less carbon-intensive, emission-intensive, and dirty development.
- i. To hasten the integration and coherence of policies to fulfil the Sustainable Development Goals (SDGs) of the UN in light of SDR 2020 and our Nationally Determined Contributions.
- j. Streamline the processes for decision-making and coordination between ministries and provinces.
- k. To assist the optimal utilization of opportunities, particularly financial opportunities, accessible both domestically and globally.
- l. Encourage the development of appropriate financial incentives to encourage public and private sector investment in adaptation and mitigation measures.
- m. Improving institutional capability, institutional knowledge, and awareness among key stakeholders.
- n. To promote tree planting, resource conservation, environmentally friendly solutions, and long-term viability.¹⁴⁴

¹⁴⁴ GOPMCC NCCP (2021) [Online]. Available: <https://mocc.gov.pk> (accessed Jul. 02, 2023)

3.8.1 Challenges Of NCCP

After the 18th Constitutional Amendment, there is institutional overlap and confusion. There is institutional overlap and misunderstanding following the 18th Constitutional Amendment. The "Concurrent Legislative List" of Pakistan's 1973 Constitution covered the problem of "environmental pollution and ecology," which meant that legislation could be passed on it by both the National Assembly and the Provincial Assemblies. The provinces were given responsibility for "environmental pollution and ecology" as part of the 18th constitutional amendment, along with 46 other topics. However, as provided by Clause 6 of Article 270 AA (Declaration and Continuance of Laws, etc.), the federal power and jurisdiction persisted. This suggests that the federal government might still play a part in and be held accountable for environmental and climate change-related issues. Federal or provincial officials have not refuted or explained this circumstance. Institutional problems that are inherent. The numerous inherent difficulties that climate change presents to society generally limit the NCCP's ability to do its job. The impact of climate change has long-lasting effects that last for decades or even centuries. The government's existing planning framework makes it difficult for it to address such long-term problems. These difficulties include.

- a. While development plans normally cover a half-decade timeframe, the considerable time it takes for the consequences of climate change to appear and be felt is a barrier to successful policy design and implementation.
- b. An interdisciplinary and cross-sectoral strategy is necessary to comprehend the consequences of climate change and respond appropriately. Governmental organizations must have a diverse variety of skills and knowledge to address the various aspects of climate change.
- c. Strong interest groupings with fewer losers and many widely distributed winners.
- d. International and national authority

Difficulty to implement; The execution of climate change policy is the biggest challenge it faces. The NCCP requires the creation of an "action plan" at the federal, provincial, and local government levels before beginning the enormous task of implementing policy. Because of the enormous misunderstanding and lack of awareness of the administrative and legal authorities of the laws, policies, and programmes transmitted to the provinces, there appears

to be less interest in establishing a policy with less specific mandates. The administration also wants to deal with the country's most pressing issues, like terrorism, energy shortages, and financial crises. Based on Pakistan's climate change policy, an assessment of perceived environmental security. The provinces losing control over climate change policy because of the potential conflicts and overlapping goals, responsibilities, and priority difference between the provinces and federal government is another challenge.

The mainstreaming of NCCP in discussions in the public sector. Without significant vertical and horizontal coordination efforts involving all stakeholders from government, civil society, technocrats, commercial businesses, and the public, it would be hard to integrate NCCP into public sector discourse. Prior to now, formal institutionalized coordinating efforts were mostly horizontal and concentrated in the public sector. There hasn't yet been any vertical coordination between the federal, provincial, and local authorities.

Cabinet Committee on Climate Change; To coordinate government activities, the Cabinet Committee on Climate Change was established at the beginning of 1995. The "Prime Minister Committee on Climate Change" was eventually given this name in 2004. This group, which is supposed to convene yearly, constitutes the highest political authority in charge of coordinating climate actions. The prime minister of Pakistan was the head of the cabinet and the heads of departments the of water and electricity, food and agriculture, science and technology, and the environment, the special advisors of the committee. The committee's mandate is to provide direction for the nation's climate change policies. Due to its lack of sustainability, the body has been unable to forge ties among the ministers.

The Core Group on Climate Change was founded by the then-Ministry of Environment; It intended to shape Pakistan's strategy and policies toward the UNFCCC negotiations that have begun in response to the approval of the Bali Plan of Action (2007). The committee included people from think tanks, civil society organizations, and other ministries. The apparent lack of interest in the issue on the part of other pertinent ministries hindered this group's usefulness, and by the end of 2013, it had ceased to exist.

The provision of climate change data and information; Since it reduces uncertainty in decision-making processes, the availability of climate change data and information is regarded as a critical factor in mainstreaming the problem. Inadequate knowledge and

statistics on the consequences of climate change and related solutions is a major obstacle to NCCP implementation and mainstreaming in Pakistan. [117]

3.8.2 Other Supporting Policies And Framework

3.8.2.1 Framework for implementation of climate change policy (2013)

Since it reduces uncertainty in decision-making processes, The availability of climate change data and information is regarded as a critical factor in mainstreaming the issue. The lack of information and scaled-down data on the effects of climate change and related solutions is a major obstacle to NCCP implementation and mainstreaming in Pakistan. A national adaptation plan, nationally appropriate mitigation action, and submission of the second national communication to the UNFCCC are all intended outcomes of the framework document.

The framework includes crucial success-enabling elements including securing high-level government support, boosting donor community engagement, and attracting global climate money. (6.1-page no.31) The donor community's lack of interest in climate change-related activities is identified as a key implementation challenge for the NCCP's mainstreaming. In a similar vein, it highlights the significance of private sector involvement in the efficient execution of national climate change adaptation and mitigation efforts.¹⁴⁵

3.8.2.2 National disaster risk reduction policy (2013)

To improve vulnerability and risk assessment through a multihazard approach, assign roles and responsibilities that are clearly defined, foster inter-organizational partnership, accountability, and transparency, and lessen the nation's exposure to various hazards, the National Disaster Risk Reduction Policy (2013) seeks to strengthen community resilience. The policy aims are as follows, and they take climate change issues into account while planning for national growth and capacity building:

- a. Creating a national integrated capability to track liability and hazard trends, including any possible effects of climate change.

¹⁴⁵ "Framework for Implementation of Climate Change Policy" (2014-2030). [Online]. Available: <http://www.gcisc.org.pk>

- b. Encouraging disaster risk-aware development planning that addresses these risks along with environmental and climate change concerns.

Despite focusing on national resilience against both natural and man-made hazards, the vision statement ignores the strong correlation between climate change and the increasing frequency and intensity of catastrophes as well as their ability to undermine community resilience.

It is important to stress that the current policy statement is not in line with the NCCP's main objectives. The NCCP dedicates a separate section to disaster risk reduction, but the National Disaster Risk Reduction Policy, which was created after the NCCP, emphasizes climate change primarily concerning hydrometeorological hazards like floods, droughts, and the melting of northern glaciers.¹⁴⁶

3.8.2.3 National environmental policy document 2005

In 2005, the National Environment Policy was created at a time when the country's climate change challenges were not well understood by officials. The environment policy document points out several issues, such as desertification and diminishing water supplies, that may be related to Pakistan's vulnerability to the devastating effects of climate change. One of the main environmental issues covered in this policy document is climate change.

The issue of climate change is only explicitly discussed in previous section of the NCC policy, which is copied from the National Environment Policy document here: "Climate Change and Ozone Depletion." 3.6. To adequately address concerns about climate change and protect the ozone layer, the government must:

- a. Create and carry out a national action plan for combating climate change.
- b. Create the National Clean Development Mechanism (CDM) Authority.
- c. Establish and implement a policy and operational structure to manage the CDM process successfully.
- d. To promote the use of eco- friendly technology.

¹⁴⁶ GOP "MOCC NDMA" (2013). [Online]. Available: <https://cms.ndma.gov.pk> (accessed Jul. 02, 2023).

- e. Utilize ozone-depleting substances less frequently after the Montreal Protocol. (3.6 page 13-14)

This constrained strategy only considers CDM as a tool for mitigation and is limited to preserving quality of air, which is merely main manifestation of climate change. Although the requirement for a national climate change action plan is acknowledged, the significant cross-sector effects on Pakistan's vulnerable demographic profile are not taken into account.¹⁴⁷

3.8.2.4 Alternative and renewable energy policy document 2011

The Alternative and Renewable Energy (ARE) Policy 2011, published by the Ministry of Water and Power in 2011, offers a roadmap for maximizing ARE in Pakistan. The AEDB is given the authority to create the national strategy, policies, and programs for the use of ARE under the AEDB Act (2011). All ARE sources, including solar, wind, small-scale hydropower, biogas, biofuel, and energy from waste, are now covered under 2011 ARE Policy.

The ARE Policy 2011 develops new financial frameworks and addresses concerns like biofuels and rural energy services. Energy planning, as well as economic and social progress, must be completely mainstreamed and integrated, it aims to put the required infrastructure in place. Similarly, to that, it has sought to address concerns raised by stakeholders, handle policy-related issues, and contains plans to establish an Alternative Energy Development Fund to assist this sector of the economy.

When the NCCP was being prepared, stakeholder consultations for the ARE 2011 were already well underway. Thus, the ARE Policy 2011 complements the climate change policy.

The social and environmental effects of alternative fuels, notably supply networks for biodiesel, must also be considered. The EPA is listed in the alternative fuel section as the principal organization in charge of creating aldehyde and methanol production emissions restrictions.

¹⁴⁷ Government Of Pakistan Ministry of Environment "National Environmental Policy" (2005.). [Online]. Available: <https://pbit.punjab.gov.pk> (accessed Jul. 02, 2023)

To fund ARE projects, the ARE Policy focuses on obtaining carbon credits under the CDM. As part of its obligations under the CDM in this area, the AEDB is permitted to provide technical assistance to the (previous) Ministry of the Environment. The AEDB supports local CDM capacity building, CDM promotion, and ARE awareness.¹⁴⁸

3.8.2.5 National power policy (2013)

This Power Policy was established by the ministry of Water in 2013. This NPP Policy's main objective is to entice domestic and foreign investment to increase the nation's capacity for power generation, especially the provision of inexpensive electricity.

The National Power Policy plan attempts to shift Pakistan's energy balance in favour of affordable sources such as biomass, coal, natural gas, hydropower, and nuclear energy. Small- and medium-sized river hydel projects would face fierce competition from domestic and international investors. A few of the currently under-construction hydel projects will be privatized, and international organizations will be urged to collaborate on major hydroelectric infrastructure projects. The National Power Policy states that to prevent load shedding in Pakistan, 7,000 megawatts (MW) of power needed to add.

Specific objectives of the policy is to cover the demand-supply gap. The initiative, however, does not have a clear strategy for cutting emissions. The energy industry is leading the charge against climate change globally because of its significant share of GHG emissions.

Despite the fact that this sector accounts for more than half of all emissions in Pakistan, however it is not evaluated the inexpensive coal might influence the current low-emission position of country. It also not allow any proposals that would encourage renewable energy and increase energy efficiency by creating carbon pollution standards for high-emission subsectors.¹⁴⁹

¹⁴⁸ GOP "Alternative and Renewable Energy Policy" (2011.). [Online]. Available: <http://climateinfo.pk> (Accessed Jul. 02. 2023)

¹⁴⁹ GOP "National Power Policy" (2013.) [Online]. Available: <https://www.ppib.gov.pk> (accessed Jul. 02. 2023)

4. CONCLUSIONS

Environmental threats posed by global climate change threaten all living and inanimate beings. Threats, on the other hand, reveal the need for security. The emergence of the need for security dates back to ancient times, but the concept of security took its contemporary form, according to Arends, with the combination of three different uses that the Athenians tried to prevent the destruction of their empire, the religious emphasis of the Romans and the Hobbes philosophy described as the goal of preventing civil war. The need for security is the instinct to protect from danger. According to the definition that the environment is a whole of the mutual interactions of living and inanimate beings, any danger caused by interactions directly reveals the instinct of protection from these dangers. Accordingly, the safety of the environment has always existed with security until the periods when it entered the literature, and there is research linking the collapse of the ancient Sumerian, Mayan, and Roman Empires to environmental reasons. From this point of view, the relationship between environment and security becomes clearer. Although studies linking the environment and security have been conducted since the 1960s and 1970s, the entry of these links into the literature under the name of "environmental security" was with the Copenhagen School. The Copenhagen School asked the question of which of the various issues that fall within the scope of security for the solution of environmental problems and other problems that occur as a result of increasing interdependence in the globalization process can be seen as the matter of security. He presented the concept of "security" as a solution and analyzed security based on the sector as military, political, economic, social, and environmental security.

The environment came to the fore in security policies in the 1973 Oil Crisis. Due to the acceleration of climate change the ozone layer depleted in 1980s. Problems caused by environmental hazards have been overshadowed by national security issues such as terrorism, etc. until a certain period; but especially with the increase of climate change and the observation of global climate change has also been included in the 'security' process as a subject of the environment. However, since the 1970s, attention to environmental problems has been realized in the framework of national security. After the Cold War, people now more often associate security with everyone's safety, not simply the security of a specific state's population. The human and human environment has now started to be considered to

solve problems related to the environment and to ensure security, including creating a sustainable future.

With the introduction of the concept of environmental security into the literature, many definitions have been made. In recent years, environmental security has been understood as a comprehensive security for the environment, including human, physical, social, and economic well-being. After all, environmental security is a concept that has come to the fore for protection from environmental threats. State, human or ecosystem-based security research has generally been conducted on the concept of environmental security. In this sense, environmental security is discussed from different perspectives by traditional (national) security, common security, humanitarian security, and ecological security approaches in terms of security focus. These approaches differ in terms of the application object, which is the answer to the question of what should be ensured. The most important factor that ensures security in environmental security is the state; but over time, although the state is considered the biggest decision maker, international organizations, non-governmental organizations, societies, and individuals have also started to be accepted as important actors. In the traditional security approach, the main purpose of ensuring environmental security is to ensure national security, and the state is both ensuring security and security against environmental threats (object of application). In common security, the main purpose of ensuring environmental security is to ensure national and international security. Here, the object of the application whose security is ensured against environmental threats is also the state; but the actors that provide security are the state and international actors. The main purpose of ensuring environmental security in human security is to ensure that human life is maintained safely. The object of the application is the individual, and the actors who provide security are individuals, society, state, international organizations, and non-governmental organizations. Finally, the perspective of ecological security, the main purpose of ensuring environmental security is to ensure ecosystem security. The object of the application is ecological systems in which all species are considered equal including man; the actors are individuals, societies, states, non-governmental organizations, and international organizations.

The greatest danger to natural systems is the warming of the planet. Changes in climatic circumstances become the most important issue facing the international community as a

result of this global warming. Both natural and human-made factors contribute to the shift in the global climate. Since the Industrial Revolution, climate systems have changed as a result of the above-average rise in temperature caused by the buildup of GHG in the atmosphere. Nature, people, societies, states, and the global community are all impacted by the effects of climate change that are already occurring and are predicted to occur. In this sense, a negotiation process has been ongoing ever since the effects of climate change were recognized and included in the world community's agenda. The implications of global climate change are increasing as this negotiation process goes on.

It is getting worse. Although the first climate conference on the coming agenda of climate change was held in 1979 with the support of the World Meteorological Organization (WMO), the first important development on climate change took place at the 1992 Rio World Summit, known as the auspices of the UNEP. The UNFCCC was the most significant document to result from the conference, which was attended by both state and non-state entities. The UNFCCC is a convention that governs the tenets, plans, and commitments to halt global warming and cut GHG. In the contract, countries are burdened with "Common but differentiated responsibilities" according to their development status and special conditions. The idea behind "common but differentiated responsibilities" is that these nations should bear a greater share of the burden given the higher concentration of greenhouse gases some nations discharged into the atmosphere following the Industrial Revolution.

Since the beginning of the negotiations, the approval of the Kyoto Protocol in 1997 and the Paris Agreement in 2015 have been the two most significant events. With the adoption of the Kyoto Protocol at the conference held in 1997, for the first time, a legal document containing legally binding targets for reducing greenhouse gas emissions and preventing the threat of climate change, strengthened the commitments in the UNFCCC has been adopted. Industrialized countries have committed to balancing greenhouse gas emissions based on contract principles. The Convention itself only encourages countries to do so; it has no direct binding. Another important agreement is the Paris Agreement signed in 2015. The agreement forms the basis of the measures to be taken against climate change after 2020. The new agreement ends the tight separation between developed and developing countries that have determined previous efforts, instead establishing a common framework for all countries to make the best effort and further strengthen it in the future. The agreement put forward a

global action plan that will reduce warming below 2 degrees Celsius to prevent global warming and global climate change that threatens the world. It is predicted that irreversible climatic disasters will occur in the world if the temperature increase exceeds the critical threshold of 2 degrees. These disasters; will affect nature, individuals, societies, states, and all living and inanimate beings. Naturally, this situation will affect all units of nations and international relations in political, economic, social, and social terms. At this point, the relationship of global climate change with the concept of security is questioned. The IPCC research took security climate change interaction into account, and the Fourth and Fifth Assessment Reports contained noteworthy cautions on the topic.

Global climate change is involved in environmental security as it contains environmental threats and reflects its effects directly on the environment. For this reason, according to the answers to the question of whose or what security (object of application), the issue of climate change is treated by traditional, common, humanitarian, and ecological security approaches in a similar way to the concept of environmental security. Accordingly, the object of security within the framework of climate change; is states in traditional/national security, international society, individuals in humanitarian security and ecosystem in ecological security to ensure the security of states in international/common security. Among these four approaches, the approach that offers the most advantageous strategies for reducing the effects of climate change and eliminating the damage it causes is the ecological security approach. The multidimensional effects of climate change require an ecologically based understanding of security because the basis of ecological security discourse requires the ecosystem's resilience to time and species. This resilience, on the other hand, is based on the capacity to make life sustainable and maintain the organizational structure and functionality even in case of disorder of order and changes. The most important situation in this regard is the adaptability of the actors who will provide security. This requires strict compliance, constant communication, and modesty because the ecosystem is too complex for harsh policies. The principles of security to be applied naturally should be re-evaluated according to local knowledge, understanding and values. In this sense, ecological security principles are very effective in solving the global climate change problem.

It is of great importance for the whole world to adopt security understandings for the solution to climate change and to implement appropriate strategies and policies. In this sense, the

approaches of states, which are still defined as the biggest decision-makers in the international system, are important. Pakistan, located in South Asia, is one of the key countries on climate change with its population, geographical location, political turmoil, in short, geopolitics. It is a country where the physical effects of climate change are seen and will be seen intensively. The fact that it consists of a rich mosaic of ethnicity, culture and religion causes political disintegrations and domestic uprisings from time to time in terms of internal security problems. However, in the region where Pakistan is located; caused by unstable and weak states such as Afghanistan. It is also exposed to security threats. Pakistan is particularly focused on India and Afghanistan. The inability to develop relations between Pakistan and Afghanistan, and the future of cross-border conflicts, which are rising rapidly, could lead to major military threats for Pakistan. However, another regional threat element of Pakistan is India, which it has fought four times to this day. The two countries, which have problems due to the issue of Kashmir and the sharing of transboundary waters, are struggling with crises in the shadow of nuclear weapons. While these problems constitute Pakistan's regional problems, other problems in this sense, ethnic movements, separatist rebellions, the formation of new ethnic groups and religious conflicts.

On a global scale, Pakistan faces international terrorism, nuclear armament, threats caused by the challenge of the Asia-Pacific region and other countries at sea, environmental disruptions, energy problems, food problems and security problems related to climate change. The most important of the country's security problems is climate change, also given the possibility that it could increase the impact of current security problems. Pakistan is the vulnerable country to climate change effects due to its large population, rich biodiversity, long coastline, high-poor population, and large agricultural sector. With climate change, situations such as increasing temperatures in the Pakistan ecosystem, changes in precipitation models, rising sea levels, increasing droughts, melting glaciers, increasing floods, and decreasing groundwater levels are foreseen. Climate change will also negatively affect social and economic systems such as agriculture, food security, water security, energy security, health and humanitarian security, economic development and growth, migration, and conflict in Pakistan. For this reason, Pakistan's policies and strategies are important along with its perception of security towards climate change.

Climate change in Pakistan began to become apparent as a problem towards the end of the 1980s. Despite predictions that the impacts of climate change will be severe in Pakistan, and climate change discourses that affect policy eventually. A search of the Department of Defense and Ministry of Foreign Affairs of Pakistan's official websites turned up no studies, reports, or publications on the connection between climate change and security. It emphasizes how crucial it is for wealthy nations to support developing nations' attempts to minimize and adapt to climate change in the Third World Discourse by giving them financial and technological support. Sherry Rahman in the headline interview with the Guardian. We are all aware that the commitments made in international fora have not been kept. Additionally, she stated that wealthy polluting nations, who are mostly to blame for the nightmarish climatic breakdown, have broken their commitments to curb emissions and assist impoverished nations in adjusting to global warming, and that reparations were long overdue (Rahman, Sh, 2022). From this Pakistan expects financial help from developed countries. In the updated nationally determined contribution in 2021 Pakistan promises to reach the target aims to shift 60% renewable energy and reduce its projected emissions by 2030. In the Win-Win discourse, Pakistan's focus is on renewable energy development; however, Pakistan has also launched its "Green Pakistan Program" to expand its forest cover, lessen deforestation, and stop desertification. The "Clean Green Pakistan Movement" has also been developed across the nation to encourage sustainable practices and environmental cleanliness. Aiming to have 60% of its energy will be earned from renewable sources by 2030, Pakistan has also set ambitious goals for the production of renewable energy. Finally, the necessity for social justice and environmental sustainability among the underprivileged is prioritized in radical green discourse. Supposedly, the economy of the nation is in danger from climate change. Here, it's crucial to note that Pakistan requires a new approach to growth. Since 2012, the Third World and Win-Win discourses have dominated Pakistan. No instance of Radical Green Theory in front of policy practitioners has been uncovered in the research.

The policies implemented within the scope of Third World discourse in Pakistan are advocates of their welfares in the climate change negotiation process, making great efforts to add the principle of “inequalities between developed and under developing countries in terms of, technology, and economic power” to the UNFCCC. The security approach in which

these policies are harmonized has been determined as traditional security. The policies implemented within the scope of the Win-Win Discourse is such as establishing an NCCP 2012, presenting the (NCCP), the Action Plan sets out principles to ensure sustainable growth. The security approaches in which this process has harmonized have been traditional, common, and humanitarian. Policy practices within the scope of Radical Green Discourse have not been found in Pakistan. Based on this, Radical Green Discourse is Pakistan's perception of security as a state.

As examined in the case of Pakistan, the perception of environmental security usually stands out with practices aimed at ensuring the safety of people, whether it is the state or the individual. Even in the understanding of environmental security, the subject is human. When the reason for this is questioned, results such as culturally, socially, or religious-based people considering themselves superior to other beings can be achieved; but questioning this can be done more accurately within the fields of philosophy, etc. The important situation here is whether the ecological security approach, which is ecosystems whose subject includes people, can come to the fore over time. Shortly, it seems impossible for the ecological security approach to stand out before the states, the biggest decision makers. An ecologically based security approach to the solution of climate change by states through Pakistan. It is estimated that similar results will generally be achieved when their roles are evaluated upon prioritization. However, Pakistan is one of the countries which is most prone to adopting an ecologically based understanding of security due to its cultural and religious structure. Opinions from an ecological point of view, such as equal acceptance of species and respect for all beings in the universe, can be seen on the foundations of the belief in Muslims, which 95 % of Pakistan has. Despite this, this point of view has not passed to the level of the state, which is still considered the biggest decision maker, beyond being the views of local people and part of civil society.

It is predicted Pakistan will be in the top 5 heavily populated countries in the world. With its population of more than 300 million, the problems it will experience due to climate change, especially with conflict and migration problems, and cross-border damages can be caused. Moreover, Pakistan is one of the countries with less than 1% of GHG that cause climate change. The solution to this developing global problem requires global cooperation with states, from individuals to international organizations and non-governmental organizations.

In addition, climate change will affect all living and inanimate beings and all systems. A security approach that considers species equal is important for the liberation of the whole world. In addition, strategy practices and collaborations attended by all individuals from rural to cities and from local to national seem to be more realistic and possible for solving environmental problems. Security perceptions adopted all over the world so far are similar to Pakistan, but it has already become available because humanitarian interests are at the forefront regardless of national interest and fundamentals. Every damage done to nature and the environment in line with human interests has turned into greater harm to all beings with increasing effects. In this sense, the objects that are ensured should be not only humans or the state but also all ecological systems; only then will the security of all species and ecosystems be fully ensured. Considering that it is one of the parts of the ecosystem in its people and can survive in ecological balance, the security of all beings in this balance is equivalent to itself for a man within the framework of interdependence. If the perspective changes in terms of the security object in this way, more realistic policies can also be implemented to prevent climate change.

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