

Major Global Climate Change Policies: Nepal's Policy Response

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LETTER OF RECOMMENDATION

I certify that this dissertation entitled “Major Global Climate Change Policies: Nepal’s Policy Response” has been prepared by Deepnarsingh Basnet under my supervision. I hereby recommend this dissertation for final examination by the research committee at the Department of International Relations and Diplomacy, Faculty of Humanities and Social Sciences, Tribhuvan University in the fulfillment of the requirements for MIRD 526 Thesis for the Master’s Degree in International Relations and Diplomacy.

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Research Supervisor

May 2022

DECLARATION

I hereby declare that the work has been done by myself and no portion of the work contained in this document has been published or submitted in support of any application for any other degree or qualification of this or any other university or institution of learning. In case of other authors' information, ideas and arguments, the sources have been duly cited and acknowledged as per the requirements. The copyright of this research work belongs to the author.

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ABSTRACT

Climate Change is one of the rising issues in contemporary world. A slew of severe climatic consequences emerges, including disturbance of the hydrological cycle, fast glacier melting, and extreme and unpredictable weather patterns. These fast climatic changes are limiting human existence and have significant ramifications for critical supplies of livelihood and development such as water, food, and energy. Adapting to severe climatic consequences while also transforming its development model to efficient and renewable energy sources in order to meet the long-term goal of the Paris Climate Agreement (2015) is difficult. Climate change issue came into debate after Stockholm Conference, 1972. United Nation is biggest platform to deal with climate change with making difference treaties and accords and is helping to make policies internationally and domestically. Intergovernmental Panel on Climate Change (IPCC), U N Framework Convention on Climate Change (UNFCCC), Kyoto Protocol, and Paris agreement are key policies making base regarding climate change. Despite having huge consensus on those agreements and accords, still difficult on implementation and this is major challenge of global climate change policies.

Nepal must adapt to these negative climatic changes while still contributing successfully to the 2015 Paris Climate Agreement targets without jeopardizing its economic development. Being much vulnerable in case of climate change, Nepal successfully working with policies and different institutional mechanism more on adaptation. Nepal's National Climate Change Policy (2019), Fifteenth Periodic Plan and Sustainable development goals focus on attaining long-term development via climate resilience. Climate resilient development, on the other hand, necessitates specific measurable and achievable mitigation and adaptation targets, as well as a well-coordinated institutional structure of tracking and facilitation from the center and a well-informed and resourceful climate response structure at the local level. In policy frameworks, such an integrated and inclusive approach exists, but it is not successfully incorporated in the institutional structure.

Keywords: Climate Change Policy, Nepal, Mitigation, Adaptation

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LIST OF ABBREVIATIONS

AOSIS- Alliance of Small Island States
CO₂- Carbon Dioxide
CDM -Clean Development Mechanism
CBDR-Common but Differentiated Responsibility
CBDR-RC- Common But Differentiated Responsibilities and Respective Capabilities
COP-Conference of Parties
DIRD-Department of Department of International Relations and Diplomacy
DRRM- Disaster Risk Reduction Management
EIA- Environmental Impact Assessment
EU- European Union
GARP-Global Atmospheric Research Programme
GEF -Global Environment Facility Trust Fund
GMACC -Global Military Advisory Council on Climate Change
GHGs - Greenhouse Gases
GDP- Gross domestic product
HST - Hegemonic Stability Theory
IPPC - Intergovernmental Panel on Climate Change
ICSU - International Council of Scientific Union
IMO - International Meteorological Organization
IMF - International Monetary Fund
IR - International Relations
INDCs - Intended Nationally Determined Contributions
JUSCANZ - Japan, US, Canada, Australia, and New Zealand
LULUCF - Land Use, Land- Use Change and Forestry
MoPE - Ministry of Population and Environment
LAPA - National Framework for Local Adaptation Plan for Action
NCCP - Nepal National Climate Change Policy
NGOs - Non-Governmental Organization

QELRC - Quantified Emission Limitation and Reductions Commitments
REDD+ - Reducing Emissions from Deforestation and Forest Degradation plus
SBTA - Scientific and Technological Advice
SCOPE - Scientific Committee on Problems of the Environment
SMIC - Study on Man's Impact on Climate
SBI - Subsidiary Body for Implementation
SDGs - Sustainable Development Goals
SCEP - The Study of Critical Environmental Problems
UNCED - UN Conference on Environment and Development
UNGA - UN General Assembly
UNEP - United Nations Environmental Program
UNEP - United Nations Environmental Protection
UNFCCC - United Nations Framework Convention on Climate Change
UNO - United Nations Organization
WCP - World Climate Program
WCED - World Commission on Environment and Development
WMO - World Meteorological Organization
WTO - World Trade Organisation

CHAPTER 1

Introduction

Climate change is a distinctively global concern due to its massive negative consequences across globe. The formation of a collective will and reaction in the age of globalization is complicated by the diffuse structure of international decision-making. Because of the scope and complexity of climate change, no state can successfully combat its consequences. Thus, to produce collaborative efforts for its solution, international climate change regime needs a worldwide consensual climate change policy more accurately. The same complexity has sparked convoluted political disagreements among international players, including states and non-state groups, complicating the international climate change system. Understanding the international climate change regime, its formation, and limitations necessitates not only an understanding of the science that has brought this issue to international attention, but also an understanding of the political and economic foundations that underpin interstate negotiations.

The primary goal of climate change policy is to reduce greenhouse gas (GHG) emissions into the atmosphere via mitigation and to strengthen vulnerable populations' capabilities through adaptation (IPCC, 2015). The fossil-based contemporary and industrialized economic systems that rely on cheap but filthy energy and power sources like coal, oil, and gas are the major producers of greenhouse gases. This conventional western paradigm of development, which focuses on the forces of production and consumption using the environment and its resources, is regarded as the essential path to growth, and hence aspired by both rich developed and poor emerging countries. The unbreakable link between fossil fuels, contemporary civilization, and climate change cannot be denied. The statement's underlying assumption is obvious: modern technological society is based on fossil fuels, and a successful climate change regime aimed at naturally acceptable levels of greenhouse emissions necessitates replacing fossil fuels with alternative energy sources to power modern civilization. Attributing contemporary technological civilization to fossil fuels is in a sense, admitting that the western industrialized states are substantially to blame for the

accumulating greenhouse gases that cause global warming and eventually climate change. This also means that measures to reduce fossil fuel emissions, known as mitigation, will degrade quality of life in western industrialized states, which are commonly referred to as the North due to their geographic position (Archer, 2001). Mitigation will also limit the Southern emerging states' ability to grow in accordance with the Western model of development, which encourages the extraction of fossil fuels, oil, gas, and coal—all of which are rich sources of greenhouse emissions (Archer, 2001).

Climate change has a wide range of consequences, both beneficial and bad, that vary by location and are equally dependent on a state's financial capacities (The science, 2015). Temperature rises in some locations, such as the Arctic, may open up new prospects for life and growth in previously uninhabited areas (Paterson, 1996). However, the negative consequences are catastrophic, such as rising sea levels that wipe out coastal regions and, most significantly, tiny island nations, resulting in mass environmental refugees, new illnesses, and biodiversity loss (Paterson, 1996). Furthermore, rising temperatures would cause glaciers to melt, which is a renewable source of electricity and irrigation for many locations, disrupting the natural flow of water and agricultural output. Because of their inadequate political and economic infrastructure, underdeveloped countries would be severely impacted.

Environmental pollution's transboundary consequences and bilateral conflicts over natural resource usage between surrounding nations have made sustainable development a topic of major concern and interest for international relations scholars. Since 1972, this connection has been acknowledged worldwide, and it began a diplomatic process in partnership with the United Nations Environmental Program (UNEP) that resulted in a number of international accords (O'Neill, 2009). Global climate change as a threat to mankind as a whole has yet to be fully understood and prioritized as a security concern, because threat in international relations is still mostly defined in terms of another state in an anarchic international system. The emerging idea that environmental concerns, particularly climate change and the resulting calamities as 'apocalypse,' are a threat to all and a duty of all challenges this old notion of security (Carey, 2000). In light of the new natural risks, this new idea of security has to be evaluated.

Stopping harmful concentrations and inputs of greenhouse gases (GHGs) in the atmosphere, as well as reducing the negative and unavoidable repercussions of climate change, are at the heart of international climate change policy. The United Nations Framework Convention on Climate Change (UNFCCC) created "mitigation" and "adaptation" techniques for these aims (Labatt, 2007). Mitigation is more contentious than adaptation since it has a direct impact on state economies; nonetheless, adaptation is not without political and economic complexities. Adaptation and mitigation are now deemed essential, especially with the publishing of the Stern Review, which estimates that climate change ramifications might cost up to 5 percent of global GDP per year, while decreasing emissions would cost less than 1 percent. (Review, 2009). Understanding mitigation and adaptation plans, which are at the heart of international climate change policy, is critical not just for assessing state cooperation, but also for gaining insight into how development and the environment interact in poor nations.

1.1 Nepal's Policy Response

Nepal is a developing country. Agriculture is the country's principal source of revenue. As a developing nation with massive trade imbalance, insufficient infrastructure, bad governance, antiquated technology, lack of ability and pervasive poverty—it shares all the problems of Southern countries about climate change (Karki, 2022). It features a diverse terrain of plateaus, plains, and mountains, with a mostly chilly temperature. Air, water, and soil pollution, as well as a lack of effective mechanisms and political will to address them, have already caused significant environmental concerns (Karki, 2022). Nepal faces both difficulties and possibilities as a result of global climate change. Due to climate change and Nepal's unique geology, the Intergovernmental Panel on Climate Change (IPCC) explicitly stated in its 2001 and 2007 findings that the Himalayan area and Nepal will experience extreme weather events (Karki, 2022). Nepal has challenges in adapting to climate change consequences such as the melting of its glaciers, which had previously served as a renewable source of freshwater supply. This will result in water scarcity, low agricultural yields, negative impacts on livestock and biodiversity, the appearance of new illnesses, the endangerment of the country's coastal areas, population relocation, and overall environmental and economic degradation. Several devastating floods have hit Nepal, virtually paralyzing the country's infrastructure and exposing its vulnerabilities. According to Mandal, the floods cost

Nepali Rupees (NRs.) 841 million between April 2016 and April 2017 (Mandal, 2019). Financial losses of this size spark a debate about whether the ecological version of state security should be included (Mandal, 2019).

As a developing country, it is the least responsible for climate change, with only 0.027 percent of worldwide greenhouse gas emissions (MoPE, 2015). Nonetheless, Nepal would be severely impacted by climate change (ranked fourth and thirty-first in terms of climate change susceptibility and flood hazards, respectively) (UNDP, 2015). As a result, it is entitled to all necessary technical and financial adaptation and mitigation support in order to strengthen its capability without jeopardizing its development efforts. As a result, Nepal must base its growth on a solid foundation of environmentally sustainable alternative energies. The Clean Development Mechanism (CDM), in particular, allows industrialized nations to earn carbon credits by investing in emission-reduction initiatives in developing countries (Grover, 2008). This necessitates a national policy response to international climate change policy that is largely centered on the objectives of capacity building and sustainable development.

2. Statement of the problem

Climate change is global problem due to its impacts and consequences. Each developed and developing states are responsible for anthropogenic climate change. After scientific research and collected data on impacts of climate change directed way to resolve climate change internationally (IPPC, 2015). Under United Nation, several policies regarding climate change made essential steps and global agreements to mitigate and adaptation. Despites of long run of international debates and disagreements, global climate change policies have been developed with slow process. Now, United Nation Framework Convention of Climate Change (UNFCCC) made international environmental treaty to combat "dangerous human interference with the climate system", in part by stabilizing greenhouse gas concentrations in the atmosphere (UNFCC, nd). Kyoto protocol and Paris agreement are two important treaties that directed by UNFCCC (Paris agreement is legally binding), pave global consensus on climate change. It covers climate change mitigation, adaptation, and finance and agreement was negotiated by 196 parties at the 2015 (UNFCCC, nd).

To achieve sustainable goal, mitigation and adaptation on climate change consequences, these agreements are important and guiding for climate change policy making process.

Natural catastrophes such as floods, which are mostly related to global climate change and severely harmed its infrastructure and lives. As it is believed that global climate change with its inescapable devastating consequences could further incapacitate Nepal's growth. Nepal started to address such problems and climate change policy from early time of international conventions. Nepal recently replaced Nepal Climate Change Policy (2012) by National Climate Change Policy (2019) to secure climate resilient development and achieve sustainable development (NCCP, 2019). Nepal's climate policy goal of climate resilient development is evaluated in light of the required essentials of the concept, the 15th periodic plan and Sustainable Development Goals (SDGs) Status and Roadmap: 2016 -2030 strength of its policy frames and operational viability and infrastructure (NPC, 2019).

3. Research Questions

The research questions on politics of climate change in major global climate change policy: Nepal's policy responses are:

1. How major global climate change policy has been developed?
2. What are the major achievements of global climate change policy?
3. How Nepal is responding global climate change policy?

4. Objectives of Study

The study is focused on the following objectives:

- I. To research development of global climate change policy
- II. To draw attention to the consequences of climate change for Nepal and the current gaps in its policy response;
- III. To investigate solutions for Nepal's capacity building and sustainable development within the framework of worldwide climate change policy design.

5. Significance of Study

The research makes a significant contribution to the fields of international relations and environmental science. There are few studies on the subject of establishing connections between these two, and they frequently lack a viewpoint from developing countries (Karki, 2022). It contains an evaluation of the local and international efforts on global climate change regime, as well as an assessment of climate change consequences and prospects for Nepal. The shortcomings in policy and government infrastructure that have been revealed will aid authorities in reevaluating and closing the gaps. At this point, the current study is not only a source of information for students in both disciplines, but also a helpful document for Nepalese policymakers and stakeholders.

CHAPTER 2

Literature Review

The majority of the studies focus on several components of the intended study, including the scientific dimension of climate change, the political and economic underpinnings of international climate change policymaking, and, last but not least, the evaluation of Nepal's climate change policy. Dana Desonie's book *Climate: Origins and Impacts of Climate Change* provides a thorough examination of the causes and effects of climate change (Desonie, 2008). Natural and human-induced influences are discussed. Finally, strategies such as adaptation and mitigation measures were investigated. It is a crucial contribution and source for the planned research since it contains a full scientific explanation of global warming, the carbon cycle, and greenhouse gases, as well as how to resist them. All of the above topics are accompanied by several graphs and illustrations that help to simplify the science of global climate change. Jerry Silver's book: *Global Warming and Climate Change*, is another noteworthy contribution to understanding the science of global climate change, with an emphasis on greenhouse gas emissions (Jerry, 2008).

Similarly, Julie Kerr Casper's book *Greenhouse Gases: Worldwide Impacts*, emphasizes greenhouse gases (Julie, 2010). In addition, the impact of climate change, carbon sequestration, and mitigation and adaptation programs are discussed. Natelie Goldstein's book *Worldwide Warming* examines not just the scientific aspects of climate change, but also international environmental documents to show how climate change became a global concern (Goldstein, 2009). Berz Metz addresses scientific elements of climate change and makes connections between climate change, development, and energy (Metz, 2009). Though Frances Drake's book *Global*

Warming: The Science of Climate Change covers hard scientific nuances of climate change that will not be discussed, the last chapters are on the indirect effects of climate change and governmental responses to them. The importance of a consensual policy has been stressed by the author (Drake, 2000).

Different writers have discussed the political and economic basis of international environmental politics in general, and climate change policy in particular. Peter Dauvergne's edited work, *Handbook of Environmental Politics*, is a significant contribution to the knowledge of environmental politics. It begins with the tragedy of the commons, then moves on to North-South conflicts, environmental governance, and finally, the impact of scientific communities on environmental politics (Dauvergne, 2005). J Frances Drake's book *Climate of Injustice, Global Inequality, North-South Politics, and Climate Policy* provides insight into the glaring economic inequality between the North and the South, as well as the politics and roadblocks it has created in the development of international climate change policy (Drake, 2000). To help readers grasp inertia, many explanations have been provided. It is a commendable effort to bridge the divide between the two parties. Finally, the author emphasizes the importance of sensible international climate policy. Kate O Neil's book, *Environment and International Relations*, aids in comprehending the link between the environment and international relations. The book delves into the many political and economic bases of the two's interplay, as well as international institutions and ideas that explain how they interact (Neil's, 2009). Mathew Paterson's book *Global Warming and Global Politics* delves at the complexities of environmental politics in the context of international relations (Paterson, 1996).

The most prominent writer on environmental politics is Mathew Paterson. The intricacy of international climate policy is examined in light of all existing theories of international relations in this book. Furthermore, the political and economic factors that are impeding the establishment of a worldwide climate policy are investigated. Michele M. Betsill, Kathryn Hochstetler, and Demetris Stevis edited book *International Environmental Politics*, which is divided into three parts: the context of the study of international environmental politics, the forces that shape international environmental politics, and the normative frameworks for evaluating international environmental politics (Betsill, 2006). The book is a distillation of international environmental political disputes, and it will be heavily used in the proposed research.

While talking about The Paris Agreement (PA), 2015, this aims to counterbalance the threat of climate change by maintaining global temperature well below 2 degree Celsius made numerous publications on climate change adaptation but where Nepal was not excused. Many research and investment environment were created for national policy frameworks to adopt climate change adaptation policy such as: 15th Periodic Plan (2019/2020–2023/24), National Adaptation Programme of Action (NAPA) (2010), LAPA (2011) and Climate Change Policy (2011) (GoN 2019). Nepal developed a National Framework on LAPA in 2011 to undertake adaptation efforts at the local level and guarantee climate change adaptation inclusion at all levels of the national planning process which enabled open space for climate change adaptation and was facilitate to research by project investment and funding (Regmi and Karki 2010). These process support to research on advancement of adaptation that connect the sustainability, needs of society and further study. A multidisciplinary or interdisciplinary approach, in which disciplinary knowledge is exchanged or integrated, is deemed necessary to ensure that resources are properly invested,

research is conducted, and knowledge of present status and gaps in adaptation action is regularly updated and used to inform at all level of government (Karki, 2022).

Nepal is making strong efforts to address climate change through policy design, institutional arrangements and strengthening, program creation, and implementation in response to regional and international initiatives (MoPE, 2016). With the adoption of the United Nations Framework Convention on Climate Change (UNFCCC) in 1992, national governments were urged to implement a variety of policies to limit the average global temperature increase and mitigate the unavoidable consequences (UN, 1992). Many governments have established adaptation policies and plans at various levels to respond to climate change consequences, and these policies and plans have been incorporated into wider development plans and agendas (IPCC, 2014). Nepal also created and submitted a National Adaptation Programme of Action (NAPA) to the United Nations Framework Convention on Climate Change (UNFCCC) in 2010, outlining its national adaptation goals in response to such climate risks and hazards (MoE, 2010). In addition, in 2011, the Government of Nepal (GoN) approved a national climate change strategy and a National Framework of Local Adaptation Plan of Action (LAPA) to carry out the NAPA priorities (Regmi, 2010). Recognizing the need to transition to low-carbon, climate-resilient development, Nepal adopted a National REDD+ policy in 2018 to assist govern REDD+ programs in the country (MoFE, 2018).

Kunwar in his article “Study and review CCA interventions and researches in Nepal” states that climate change impacts always bridges the health, habitat, livelihood and environmental hospitality sectors (Kunwar, 2020). He further concludes that most of the significant gaps and challenges in the successful implementation of climate change adaptation and mitigation programs

include a lack of understanding of the consequences of climate change on species and ecosystems, a weak assessment and learning process, and insufficient capacity (Kunwar, 2020). Climate change adaptation has become a priority together with mitigation in international and national policy agendas to handle this problem. In AR5 report of IPCC adaptation defines as the process of adjustment to actual or expected climate and its effects (Pachauri, 2007). But Swart analyses that there are many challenges and hurdles in implementation process of abundance adaptation strategies (Swart et al. 2014).

In recent years, scientific efforts to understand many aspects of climate change adaptation policy have risen significantly in line with policy development (Thapa et al. 2020). According to Ensor et al the IPCC AR5 working group II (WG II) compiled the most recent scientific evaluation of adaption progress. Too frequently, adaptation research and practice ignores the larger social milieu in which climate change is understood (Ensor et al. 2019). Ely further explains that be opened up to climate change adaptation policy alternatives to address the context and drivers of climate change, adaptation research and practice must grow and be established in a larger framework (Ely et al. 2014).

Ford analyses that climate change policy researches are limited in developing and least developed countries (Ford et al. 2015). While looking in Nepal's context: Because of the small amount of scientific research done, the IPCC AR4 Report identified the Himalaya, including Nepal, as a "white spot" (IPCC, nd). Adaptation is required in different places based on the degree of sensitivity and vulnerability to climate change (Sarkodie and Strezov 2019). Bhattacharjee further provides conclusion in his article named "the impact of climate change on biodiversity in Nepal: current knowledge, lacunae, and opportunities," that there is limited research on climate change

adaptation policy which discourage to respond climate change impacts (Bhattacharjee et al., 2017). Adaptation issues increase in proportion to the size and rate of climate change, and they concentrate in places where management techniques have broken down. Adaptation is thus particularly crucial in underdeveloped nations, where resources are scarce and the consequences of climate change are amplified (UNFCCC, 2011).

As climate change continues to pose a threat to global development, it is critical to do research that examines the state of climate adaptation knowledge and the extent to which it is being incorporated into regional, national, and international policies and practices (Chaudhury et al., 2016). Similarly, SDPI (2003)'s *Sustainable Development and Southern Realities: Past and Future in South Asia* is a collection of essays produced by various sustainable development experts. Gyanendra Kumar Karki's essay on the South's worry over the North's refusal to comply with the promised international norms adopted at the 1992 Rio Earth Summit is a valuable resource for the suggested research (Karki, 2021). However, there is certain comprehensive analysis of Nepal's climate change situation in the publication.

Except for a few journal papers and reports produced by researchers and NGOs, there is a severe lack of quality works on Nepal's climate change policy. The average number of published papers was 32.8 per year during the peak period (2015–2020), and 25.4 per year within a decade (2010–2020). After 2018, the trend was seen to be deteriorating. However, because the sample was confined to July 2020, the authors must acknowledge that alternative trends may exist (Karki, 2022). Sapkota and experts examine several important focuses on climate change policy formulation and restrictions in Nepal, whereas there are numerous research examining the impact of climate change on biodiversity in Nepal (Sapkota, 2019; Bhattacharjee, 2017). Nepal's limited

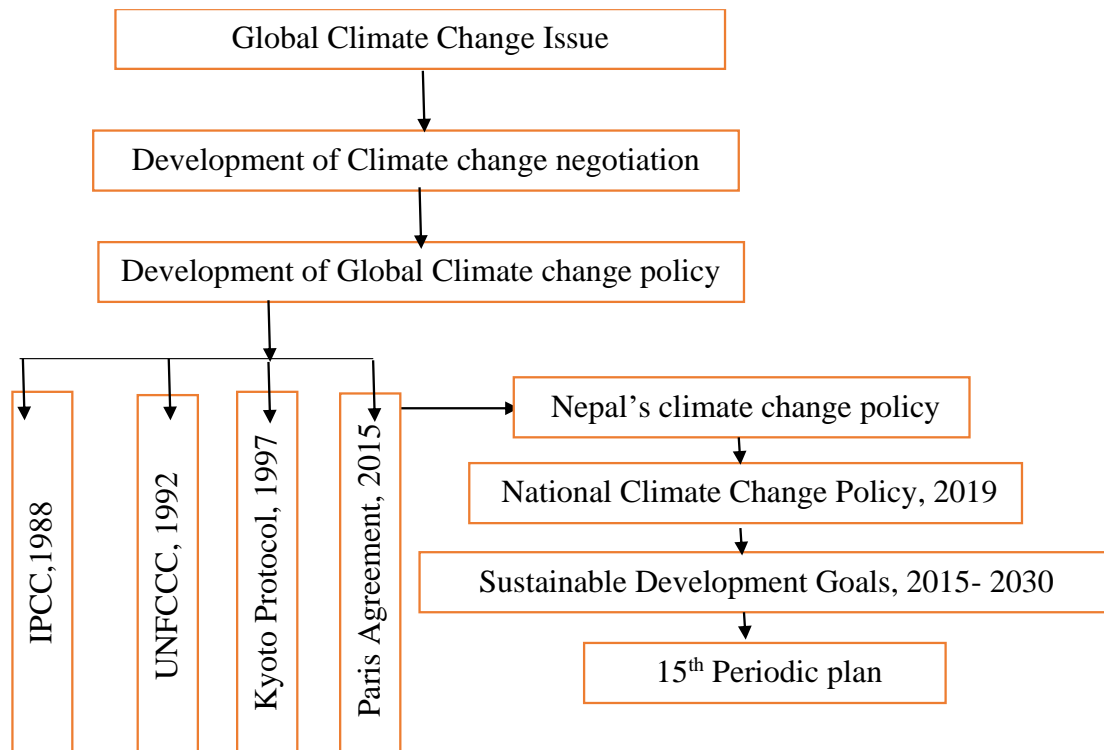
climate change literature focuses on planning and implementation due to its geographical location, complex weather and socioeconomic diversity (Gentle, 2012; ADB, 2022). However, it lacks a comprehensive study and assessment of Nepal's international climate change strategy and policy response.

Only a few research in Nepal have looked at how policy and institutional structure impact adaptation measures against climate change. The majority of past research has focused on either adaptive measures or policy action. For example: Adger, Hug; Ford and Pearce have only emphasized the needs of adaptation actions to reduce the effect of climate change (Adger et al., 2003; Ford et al., 2010). Likewise, Ojha, Ghimire, Pain, Khatri and Dhungana only observed into the policy dimensions on climate change adaptation policies into several sectors (Ojha et al., 2016). Agrawal have focused on institutional part of climate change adaptation (Agrawal, 2010). At the same time, Maharjan and Maharjan have emphasized the decisive role of climate policies and institutions in effective adaptation to climate change in Nepal (Maharjan, 2017). Not policy and institutional arrangements, but also the implementing element with different sector on climate change is important. Therefore, this paper focuses more insight on policy formation and gap mentioned above by authors and researchers.

CHAPTER 3

Conceptual Framework/ Research Methodology

3.1 Conceptual Framework



3.2 Research Design

The proposed study will be primarily based on both qualitative research but few quantitative research design will be used for climate change data analysis. It will adopt descriptive, critical and comparative methods for the analysis. Climate change politics as a central part, will serve as an independent variable to the research and international relations theories and approaches are as a dependent variable.

3.3 Research Site:

Research will be conducted in Nepal with visit to departments, libraries and essential places needed to retrieve essential information and data.

3.4 Data Collection Methods:

The secondary data will be employed for the research purpose whereas primary data will be sought only if required. The collection of the secondary data will be done through books, journals' paper, research articles, theses, and official reports of United Nations (UN), publications of think tanks, the newspaper articles, relevant blogs and websites along with the other relevant and reliable sources. In case of requirement, primary data will be collected by unstructured interviews with the experts, scholars and diplomats.

3.5 Data Analysis Methods:

Data retrieved will be critically analyzed and arguments will be developed based on the comparative interpretation of the data obtained. The data obtained will be subjected to in-depth analysis and extraction of major findings based on the comparative study of international relations theories on climate change.

3.6 Ethical Issues:

Since the study is based on general theoretical and evidence-based interpretation and analysis. There are few risks of ethical concern to be arising however, in case of intellectual property rights and plagiarism, the research will try to mitigate that issue considering the ethics in research

CHAPTER 4

Global Climate Change Policy

The politics of global climate change are more complicated than the science. It is difficult but not impossible, to bring sovereign nations with conflicting interests and alternative interpretations of contentious concepts into a coherent policy framework. This chapter traces the history of these challenges, highlighting the role of international actors in leveraging their clout, impacts of technological innovations and environmental institutions on shaping ideas, identities, outcomes, and the role of international institutions in bringing these disparate interests together under one collective will. After realizing the severe effects of global climate change, it was debated whether emission reduction should be established worldwide and made mandatory or should be determined locally while taking into account the state's resources, constraints, and development goals. As previously indicated, the question of financial and technological aid to emerging countries in order to achieve clean development has been equally important.

4.1 Evolution

Technological advancements and the advent of multinational organizations have profoundly impacted the modern world. Increased awareness of environmental issues and greatly increased international collaboration between governments and non-state entities have been made feasible by technological advancements. Environmental issues and their consequences on human civilizations were modified by refined scientific examination and dissemination of such information. Along with advances in science and technology, a revolutionary awareness of the indisputable, unavoidable necessity for international organization to combat or minimize potential disorder in the international system's anarchic structure was equally astounding. The overarching ideology of international organizations was to provide a much-needed platform for finding peaceful solutions to global crises and inter-state disputes, and to substitute measures such as balance of power with collective security in order to sustain international order (Best, 2004; Shah, 2003). Furthermore, international organizations such as the United Nations Organization (UNO), which were originally established to peacefully resolve grave issues of war and peace, high

politics, have evolved into a forum for international actors to discuss global economics, widespread poverty, environmental, and health concerns, as previously defined (Genest, 1996). The International Meteorological Organization (IMO), which has been assessing weather across states since 1787, became more successful when the United Nations Organization (UNO) was established in 1945 (Paterson, 1996). With improved technology and intergovernmental cooperation, the IMO evolved into the World Meteorological Organization (WMO), which now has a wider global reach and more capabilities.

Two scientific studies, "The Study of Critical Environmental Problems (SCEP)" in 1970 and "Study on Man's Impact on Climate (SMIC)" in 1971, are credited with laying the intellectual foundation for the 1972 Stockholm Conference on Human Environment, which resulted in the United Nations Environmental Protection (UNEP) (Soltau, 2009). These two studies discuss the consequences of growing CO₂ levels in the atmosphere (Bolin, 2007; Paterson, 1996). The Stockholm conference focused mostly on environmental pollutants, but it came to the conclusion that comprehensive and well-coordinated efforts are required to understand and track climate change. By 1973, GARP's objectives had shifted from researching atmospheric circulation to investigating the causes of human-caused climate change (Bolin, 2007). Under the auspices of International Council for Science (ICSU), the Scientific Committee on Environmental Problems (SCOPE) assembled ecologists and geologists concerned about growing carbon concentrations in the atmosphere. SCOPE began a thorough examination of atmospheric circulation in light of biogeochemical cycles such as carbon, nitrogen, and phosphorus. The need for a concerted worldwide effort led to a series of world conferences on water, food, desertification, and eventually climate in June 1979, which founded the World Climate Program (WCP) (Paterson, 1996). WCP moved its attention away from daily weather variations and toward long-term climate trends.

Despite intensive scientific attempts to learn more about the causes and repercussions of climate change, politicians and statesmen were more interested in learning about the well-known negative consequences of climate change, such as increased weather severity, drought, and flooding. In other words, they were concerned with assessing potential hazards (Joyce, 2015). A key factor for this thinking might be entrenched security anxiety in the often chaotic international system.

Environmental and geographical limits, vulnerabilities, and advantages, on the other hand, have traditionally played a key role in global realpolitik and are thus an integral aspect of international relations. Natural milieu, etymologically defined as surrounds, is an important aspect of the environment in which decision-makers must evaluate their alternatives (Vogler, 1996). Natural geographical position, notably superior command at sea, has been regarded a major power determinant by geopolitical scientists like as Alfred Thayer Mahan and Halford Mackinder (Chapman, 2011). Geographical dynamics, with their inherent rigidity were once thought to be deterministic; nonetheless, climatic changes throughout time were quickly shown to have significant consequences. Huntington and Wheeler, as referenced in Vogler, discovered "tides of climatic change" that might lead to the rise and fall of states and empires (Vogler, 1996, p. 57).

The Bolin's paper looked at how the globe is fast changing at the expense of natural resources and habitat. It underlined growing disparities between wealthy and poor, rapid environmental deterioration, and rising atmospheric concentrations of greenhouse gases and sea level, with hopeful food production, increased literacy, and decreasing infant mortality (Bolin, 2007). Unpredictable and disturbing changeable climatic changes are known to have a negative impact on the country's economy and socio-political stability. Despite these dire forecasts, Bolin concludes that the study sparked discussion and a strategy for long-term economic growth that would extend the natural resource base. The study was welcomed by the UN General Assembly, where vulnerable states to floods and droughts, such as the Maldives and Botswana, respectively, demanded international climate change action (Bolin, 2007).

Similarly, unfavorable weather patterns in the 1980s and ozone depletion, a result of rising greenhouse gas levels, upset global governments, and the Montreal Protocol was enacted in 1987 after the Vienna Convention in 1985 (Paterson, 1996). Following the success of the Montreal Protocol, agreement was reached on a similar measure to combat climate change. However, a consensus approach on climate change has been hampered by a lack of clear threat perception and more economic ramifications in the case of implementing adaptation and mitigation strategies than in the case of protecting the ozone layer. Paterson, Bolin and Soltau describe several conferences organized to bring disparate viewpoints together into a single policy framework. In 1988, the Toronto Conference on "The Changing Atmosphere: Implications for Global Security," which

included scientists, governmental and non-state officials, proposed concrete actions (Bates, 2008). Climate change has serious consequences, and initiatives to reduce CO₂ levels in the atmosphere, as well as "World Atmospheric Fund" for impoverished countries, have been proposed. The burden of proof was put on wealthy countries during the New Delhi summit in 1989, and developing countries tried to resolve the problem in the framework of the North-South divide. Green Summit, July 1989; Non-Aligned Countries, September 1989; Noordwijk Conference, November 1989; and a conference of the Alliance of Small Island States in the same month represent a year in which global warming and its ramifications are addressed on many venues by various players (AOSIS) (Bates, 2008). Small island states underscored the importance of rich governments' obligation to vulnerable developing states during these summits. They both stressed the significance of an international framework for enhancing collaboration among many parties in dealing with a complicated subject like climate change.

Despite the worrisome finding of the scientific body WG-1, little homogeneity in reaction tactics was detected (Paterson, 1996). Instead of focusing on specific targets, the United States pursued national plans. These differing perspectives forced the creation of an international agreement. On December 21, 1990, the United Nations General Assembly (UNGA) passed Resolution 45/212, calling for climate protection and preservation and establishing an International Negotiation Committee (INC) to implement the International Framework Convention on Climate Change (Paterson, 1996). After nearly seventeen months of talks and five tense committee sessions, the group came up with the proposed climate regime (Soltau, 2009). The United Nations Framework Convention on Climate Change (UNFCCC) was ratified at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro, with developed countries agreeing to reduce emissions of all greenhouse gases not covered by the Montreal Protocol to 1990 levels and assist developing countries in improving their adaptation capacity (Paterson, 1996; Boisson nd., 2011).

The international climate change regime's undercurrents progressively developed from the perception of climate change as a growing threat to the requirement for the establishment of a global climate convention. Since the Villach Conference in 1985, Bodansky has listed the outcomes of numerous conferences, emphasizing the likelihood of a changing climate and the

necessity for a global climate convention (Bodansky, 2001). When the United Nations General Assembly declared climate change "a shared concern" in 1988, the Toronto Conference actively pursued a 20 percent decrease in CO₂ emissions. Similarly, the Noordwijk greenhouse conference calls for developed nations to stabilize greenhouse gas emissions, and the first IPCC report, released in 1990, expressed alarm about a predicted rise of 0.3°C every decade (Bodansky, 2001). Bodansky has presented the specifics of the different events until the implementation of the Framework Convention on Climate Change (1992), as well as the organizers and outcomes of these events, in the Annexure.

4.2 Intergovernmental Panel on Climate Change (IPCC):

After the establishment of the United Nation (UN), many organizations were established to solve relevant problems as common. In the context of climate change, the establishment of the IPCC was endorsed by the UN General Assembly in 1988. Its initial task, as outlined in UN General Assembly Resolution 43/53 of 6 December 1988, basic principle was to prepare a comprehensive review and recommendations with respect to the state of knowledge of the science of climate change; the social and economic impact of climate change, and potential response strategies and elements for inclusion in a possible future international convention on climate (IPCC, 2015). According to Principles Governing IPCC work that approved at fourteenth session (Vienna, 1-3 October 1998), the role of IPCC is

".....to assess on a comprehensive, objective, open and transparent basis the scientific, technical and socio-economic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts and options for adaptation and mitigation. IPCC reports should be neutral with respect to policy, although they may need to deal objectively with scientific, technical and socio-economic factors relevant to the application of particular policies (IPCC-Principles, 1998, p. 1)."

The IPCC is a globally recognized institution on climate change, and its findings are largely accepted by top climate scientists and governments (France 24, 2021). In the policy making process, the Assessment Reports and most comprehensive scientific reports on climate change ever published are important and these are released on a regular basis. It has also answered requests for scientific and technical information from the UNFCCC, countries and international organizations through Methodology Reports and Special Reports, as well as Special Reports and Technical

Papers. Methodology Reports serve as recommendations and methodology to assist UNFCCC Parties in preparing their national greenhouse gas (GHGs) assessments (IPCC-Principles, 1998, p. 2). Since IPCC establishment, it has published five assessment reports, which publishes every seven years regularly (About, 2015).

4.2 United Nations Framework Convention on Climate Change (UNFCCC)

UNFCCC plays a key role on climate change policy making and coordination process. The UNFCCC created an international environmental pact to counteract "dangerous human interference with the climate system," in part by stabilizing greenhouse gas concentrations in the atmosphere (UNFCCC, 1992). Besides the common aim of reducing greenhouse gas emissions to a level that is safe for the climate system, the UNFCCC is also focused on the equally lofty goals of ensuring food security and economic development.

In article 2, the UNFCCC recommends limiting "dangerous anthropogenic interference" with the climate system through greenhouse gas stabilization and blames climate changes to human activities, rather than natural fluctuations, that are changing the atmospheric composition of greenhouse gases (Boisson, 2008; Baker, 2006). Article 2 is crucial since it illustrates the framework's essence. Article 2 depersonalizes:

“stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic (man-made) interference with the climate system. Such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner (Jaggard, 2007, p. 43).

Apart from the common aim of reducing greenhouse gas emissions to a level that is safe for the climate system, the UNFCCC is also focused on the equally lofty goals of ensuring food security and economic development. Sustainable development is at the heart of this strategy, emphasizing long-term economic growth while also ensuring environmental sustainability and poverty eradication. However, the lack of clear defining criteria for the objectives and ways to achieve them leads to ambiguity and debate. The ultimate goal of averting "dangerous anthropogenic

interference," according to Yamin, is largely focused on mitigation methods without weakening the need for critical adaptation (Yamin, 2005). Because of the inherent ambiguity of the term "dangerous," the convention is restricted, prone to numerous interpretations, and a source of policy uncertainty (Mabey, 1997). As a result, international climate change policy is a "constant dialogue" (Jaggard, 2007).

The UNFCCC has effectively replaced the concept of waiting and seeing till actual incontrovertible scientific evidences appear with the understanding of adopting preventative actions to combat climate change (Pittock, 2009). According to Soltau, a thorough debate resulted in a "specialized" framework that addressed the concerns and requirements of developing countries (Soltau, 2009). States' uneven contributions to climate change were acknowledged in conformity with the principles of justice and sustainable development. The CBDR principle cleared the road for climate cooperation and implementation by taking into consideration the individual vulnerabilities and requirements of the parties involved (Pittock, 2009; Yamin, 2005). Because of their past and ongoing contributions to the problem, as well as their technological and financial expertise in combating it, industrialized countries are saddled with onerous climate protection duties (Yamin, 2005; Pittock, 2009; Jaggard, 2007). In distributing tasks, convention takes into account the unique conditions, regional and economic weaknesses, and transitional market economies. States that are vulnerable to adverse climate change, such as small islands, low-lying states, semi-arid areas, and those that may suffer as a result of adopted regimes and countermeasures, such as those with fossil-fuel-dependent economies, should be given special consideration due to their emission limits (Paterson, 1996; Boisson, 2008).

All promises are distinguished based on the principles of equity and CB. The convention is separated into general and particular commitments, with the former being applicable to all and the latter containing requirements for industrialized countries in Annex 1 and a smaller set in Annex 11 (Yamin, 2005; Boisson, 2008). Annex 1 states include the Organization for Economic Cooperation and Development (OECD) and Economies in Transition (EITs), whereas Annex 11 states are largely developing countries (Eliasch, 2008). These pledges are described in Yamin (2005). The pact, which includes 41 industrialized countries in Annex 1, aims to reduce greenhouse gas emissions to 1990 levels, either individually or collectively. Every three years, Annex 1 nations

submit an annual progress report on emission restriction, known as a national communication, which is examined by specialists. The Annex 1's more prosperous developed states are moved to Annex 11 and given the additional responsibility of providing developing countries with the financial and technological resources they need to prepare their national communication reports, meet their commitments, and strengthen their capacity to deal with the negative effects of climate change (Yamin, 2005).

The states took three approaches to setting objectives. Intra-North and North-South schisms were visible (Boisson, 2008b; Paterson, 1996.). While conceding the insufficiency of the objectives, Japan, the United States, Canada, Australia, and New Zealand (JUSCANZ) were hesitant to enhance them (Verheyen, 2005). They requested commitment from developing countries, particularly wealthy ones (Boisson, 2008b). In particular, the United States fought hard line industrially restrictive accords, disputing the appropriateness of the precautionary principle in the absence of solid scientific certainty (Jaggard, 2007). Developing countries, on the other hand, were successful in prohibiting binding emission limits and seeking fulfillment and implementation of existing commitments, with the exception of the Alliance of Small Island States (AOSIS), which sought binding commitments for all in light of the existential threat posed by rising sea levels (Boisson, 2008.). Despite its failure to achieve universal carbon reduction objectives, the UNFCCC has symbolic value that will encourage poor countries to cooperate internationally if wealthier countries honor their pledges (Mabey et al., 1997).

4.2.1 Institutional Mechanisms

The Convention also establishes institutional and financial mechanisms, with the Conference of Parties (COP) as the ultimate body and four other associated entities charged with monitoring policy implementation and facilitating effective cooperation among participants (Yamin, 2005). The COP, in collaboration with its two subsidiary advisory bodies—the Subsidiary Body for Implementation (SBI) and the Subsidiary Body for Scientific and Technological Advice (SBTA), executes decisions and reviews their efficacy on a regular basis (Barnett & Campbell, 2010).

Though criticized, a temporary financing framework was set up under the World Bank's Global Environmental Facility (GEF), UNEP, and the UN Development Program to assist poor countries technically and financially (Paterson, 1996). According to Streck and Lattanzio, Management of financial mechanisms through an independent GEF or as a subsidiary organization of the Conference of Parties (COP) has been a topic of contention between rich and developing countries (Lattanzio, 2013). Because of the one-member-one-vote structure, developing countries preferred GEF to be a subsidiary organization of COP, because an independent GEF under the control of the World Bank would be governed only by wealthy countries. The GEF was later reorganized and recognized as an independent financial mechanism of the convention by resolution 3/CP.4, 1998 (Boisson, 2008; Review of the Financial Mechanism, 1998). However, this does not imply that it is today less reliant on donor countries, particularly the United States (Lattanzio, 2013). Apart from the financial mandate, poor countries, particularly tiny island governments, have expressed concerns about the GEF's mitigation-focused financing, which does not adequately address their adaptation requirements (Barnett & Campbell, 2010). The GEF has achieved autonomous status, with fair representation from developing and developed countries, as well as active engagement from NGOs; nevertheless, more reorganization is required to make it more effective and acceptable to poor countries (Streck, 2011).

4.2.2 Evaluation

Despite the fact that the UNFCCC and Kyoto are the outcome of fifteen years of arduous talks, Barnett and Campbell see them as "complicated organizations." The convention was criticized for missing a concrete commitment to stabilization, an insurance fund, a technology transfer framework, and no specific pledges from poor countries (Soltau, 2009). The lack of consensus on these complicated and sensitive topics is mostly due to governments' differing interests. Environmental non-governmental organizations (NGOs) identified faults in players and processes that hampered the efficiency of climate change policymaking (Boisson, 2008). They chastised the conference for focusing on procedural issues such as chairing committee disputes and disagreements, particularly between the US and other states, over favorable terminology and words in the text. The United States was singled out as a key impediment to achieving defined objectives; nevertheless, it significantly softened its attitude by recognising and restricting CO₂ as

a major greenhouse gas, aside from those covered by the Montreal Protocol, and agreeing to include target dates in the convention. Despite its shortcomings, the UNFCCC has made a significant contribution to building an understanding and a means of engagement for the creation of future policy frameworks. Policy negotiations for the convention are shaped by differences in state interests and ambitions. The policy debate's multifaceted character might be seen as a choice between a broad framework with specialized procedures or an exclusively assigned one that is fully devoted to climate change

4.3 Kyoto Protocol

The Kyoto Protocol was signed on December 11, 1997. It took effect on February 16, 2005, after a lengthy ratification procedure. The Kyoto Protocol now has 192 signatories (UNFCCC, n.d.). In a nutshell, the Kyoto Protocol puts the United Nations Framework Convention on Climate Change into action by committing developed and developing nations to limit and reduce greenhouse gas (GHG) emissions in line with agreed-upon individual objectives. The Convention merely requires such nations to establish mitigation plans and actions and to report on a regular basis (UNFCCC, n.d.).

The Kyoto Protocol is founded on the Convention's principles and provisions, and it has an annex-based structure. Because it recognizes that industrialized nations are mostly responsible for the existing high levels of GHG emissions in the atmosphere, it only binds them and lays a larger weight on them under the CBDR principle. The Kyoto Protocol's Annex B (UN, 1997, p. 24) establishes binding carbon reduction objectives for 37 industrialized and developing nations, as well as the European Union. Over the five-year period 2008–2012, these objectives sum up to an average 5percent decrease in emissions relative to 1990 levels (the first commitment period) (UNFCCC, n.d.).

The rise in transboundary environmental challenges over the last half-century has highlighted the need for effective international mechanisms. International environmental agreements (IEA) assist transnational collaboration in the fight against global environmental deterioration (Mitchell, 2003). Countries can adopt one or more IEAs to pledge to safeguard the environment (Caldwell, 1990). As the number of IEAs grows, so does the number of research looking into and analyzing their

performance. Scholars have used a variety of approaches and data sets to undertake quantitative assessments to quantify the impact of IEAs. However, the findings of past investigations are still debatable. Advocates claim that an IEA will have a considerable positive impact on improving the environmental quality (UNFCCC, 2012). The endemic character of international policy—for example, multiple participants, varying socioeconomic situations across parties, analysis, and data sets on the subject—has hindered its development. Opponents see it as a zero-sum game that will cost a lot of money to accomplish (Böhringer, 2003).

The Protocol examines disparities in emissions, wealth, and ability for change when assigning duties toward emission reductions across parties, according to the core premise of the UNFCCC, 1992, termed "common but differentiated responsibilities and respective capabilities (CBDR-RC) (Grubb, 2004)." The main sources of GHG emissions are outlined in Annex I of the Protocol. At the time, the list included members of the Organization for Economic Cooperation and Development as well as nations in transition. As a result, Annex I countries face a greater burden of globally mandated carbon reduction commitments. Furthermore, this Protocol introduces three market-based tools to assist nations in meeting their carbon reduction targets: International Emissions Trading, the Clean Development Mechanism (CDM), and Joint Implementation (Almer, 2017). These flexible market methods assist Annex I parties in more cost-effectively achieving their reduction requirements (Chazournes, 1998).

Recent research has largely looked at the effects of IEAs from an environmental standpoint. While some studies show that CO₂ emissions have dropped as a result of the Protocol (Almer, 2017), the Protocol's environmental impact is still debated. Previous studies on the Protocol's impact have had inconsistent findings, with the majority unable to discriminate between CO₂ emission reductions and other socioeconomic implications. To evaluate the influence of the Protocol alone, a proper model is required (UNFCCC, 2012). From the perspective of sustainable development, the Protocol can be analyzed. Because of technological problems and economic limits, Annex I parties with obligatory emission reduction requirements may experience some economic loss (Babiker, 2000).

To conclude, it is hard to ascertain countries' net impact because a variety of external circumstances, such as socioeconomic situations specific to each nation, might alter the Protocol's outcomes in those countries. Furthermore, while some earlier studies have looked at the Protocol's economic implications, none have looked at its environmental and economic repercussions in the same way. To build the most effective international environmental policies for attaining sustainable development, it is critical to assess both the environmental and economic impacts.

4.3.1 Evaluation

Despite the availability of the required flexibility measures, the Kyoto Protocol failed to get US acceptance (Davenport, 2008). Baker claims that the US exit inspires others, particularly EU nations, to implement the climate policy. Although the Protocol is seen as more favorable and hopeful than the Convention, it is not without flaws and requires ongoing development in order to effectively reduce world emissions (Babiker, 2000).

Boisson considers Kyoto's "legal reach" compromised (Boisson, 2011). Subscribing to this view, Davenport terms the prescribed commitment for Annex-1 states inadequate in presence of scientific requirement. Lack of a unanimous standard and procedure for QELRC allows states to choose its own preferred standard. The loopholes in the market based mechanisms are highlighted by Baker and evaluated with extensive detail by Yamin (Yamin, 2005). Boisson states that with an understanding that some of the developing states are undergoing rapid industrialization, not asking them to commit to emission reduction based on common but differentiated responsibility principle has made Kyoto Protocol a less effective instrument. This realization resulted in initiation of a two track process: establishing an ad-hoc working group to realize further commitments on Annex-I states, and continued discussion to enhance cooperative action.

4.4 Paris Agreement 2015

Climate change is a major global emergency that transcends national boundaries. It's a problem which calls globally at all levels for cooperation and coordinated responses. The Paris Agreement, the result of a decade's worth of work, brought together state, non-governmental, and well-known persons. Nonetheless, given the numerous roadblocks in the way of this extraordinary

achievement, the Paris Agreement, the slow pace of advancement is acceptable. The Paris Agreement marks the conclusion of the third phase of the UN's climate change policy (United Nation, 2016). The UNFCCC was negotiated, adopted, and entered into force during the first phase, which lasted from 1990 to 1995. From the start of the Kyoto Protocol discussions through its coming into effect, the second decade covered the years 1995–2004. The present phase has centered on adopting a more global strategy that controls all nations' greenhouse gas (GHG) emissions. To tackle climate change and its negative impacts, world leaders at the UN Climate Change Conference (COP21) in Paris reached a breakthrough on 12 December 2015: the historic Paris Agreement (UN., n.d.). The Paris Agreement is a legally binding international treaty. It entered into force on 4 November 2016. Today, 193 Parties (192 countries plus the European Union) have joined the Paris Agreement (UN., n.d.). Since then, more nations have ratified the Agreement, bringing the total number of parties to 125 in early 2017. The Agreement includes pledges from all nations to decrease emissions and collaborate to adapt to the effects of climate change, as well as a call for governments to improve their pledges over time. The agreement paves the door for wealthier countries to help poor countries with climate reduction and adaptation measures while also establishing a framework for transparent monitoring and reporting of governments' climate target (UNFCCC, n.d.).

The Paris Agreement sets long-term goals to guide all nations:

- substantially reduce global greenhouse gas emissions to limit the global temperature increase in this century to 2 degrees Celsius while pursuing efforts to limit the increase even further to 1.5 degrees (United Nation, 2016);
- review countries' commitments every five years; Nationally Determined Contribution (NDC)
- provide financing to developing countries to mitigate climate change, strengthen resilience and enhance abilities to adapt to climate impacts.

The Paris Agreement provides a long-term framework for steering the global effort. It is the start of a transition to a world with zero emissions. The Agreement's implementation is also critical for achieving the Sustainable Development Goals as well (Paris Agreement, 2016, p. 5).

A work program was initiated in Paris to establish mechanisms, methods, and recommendations on a wide range of topics in order to fully operationalize the Paris Agreement. Parties have been cooperating in subsidiary entities (APA, SBSTA, and SBI) and different formed bodies since 2016. The Conference of the Parties acting as the meeting of the Parties to the Paris Agreement (CMA) convened for the first time in November 2016 in Marrakesh, Morocco, in conjunction with COP 22. By 2018, the work program expected to be finished (Paris Agreement, 2016).

The Paris Agreement adopted through COP21 to addresses decisive areas necessary to combat climate change.

Table 1 Key Aspects of Paris Agreement.

Goal	Article No.	Addressing Goals
Long term temperature goal	Art. 2	limiting global temperature increase to well below 2 degrees Celsius,
Global peaking and 'climate neutrality'	Art. 4	Parties aim to reach global peaking of greenhouse gas emissions (GHGs) as soon as possible, recognizing peaking will take longer for developing country Parties, so as to achieve a balance between anthropogenic emissions by sources and removals by sinks of GHGs in the second half of the century.
Mitigation	Art. 4	Commitment to prepare, communicate and maintain a nationally determined contribution (NDC) and to pursue domestic measures to achieve them
Sinks and reservoirs	Art.5	To encourage Parties to conserve and enhance, as appropriate, sinks and reservoirs of GHGs as referred to in Article 4, <i>paragraph 1(d)</i> of the Convention.

<p>Voluntary cooperation/Market- and non-market-based approaches</p>	<p>Art. 6</p>	<ul style="list-style-type: none"> - To recognize the possibility of voluntary cooperation – including environmental integrity, transparency and robust accounting – for any cooperation that involves internationally transferal of mitigation outcomes. - It establishes a mechanism to contribute to the mitigation of GHG emissions and support sustainable development, and defines a framework for non-market approaches to sustainable development.
<p>Adaptation</p>	<p>Art. 7</p>	<p>Enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change.</p> <p>All Parties should engage in adaptation, including by formulating and implementing National Adaptation Plans, and should submit and periodically update an adaptation communication describing their priorities, needs, plans and actions.</p>
<p>Loss and damage</p>	<p>Art. 8</p>	<p>The Paris Agreement recognizes the importance of averting, minimizing and addressing loss and damage associated with the adverse effects of climate change, including extreme weather events and slow onset events, and the role of sustainable development in reducing the risk of loss and damage. Parties are to enhance understanding, action and support, including through the Warsaw International Mechanism, on a cooperative and facilitative basis with respect to loss and damage associated with the adverse effects of climate change.</p>

Finance, technology and capacity-building support	Art. 9, 10 and 11	The Paris Agreement reaffirms the obligations of developed countries to support the efforts of developing country Parties to build clean, climate-resilient futures, while for the first time encouraging voluntary contributions by other Parties. The agreement also provides that the Financial Mechanism of the Convention, including the Green Climate Fund (GCF), shall serve the Agreement
Climate change education, training, public awareness, public participation and public access to information	Art 12	is also to be enhanced under the Agreement
Transparency implementation and compliance	(Art. 13), (Art. 15)	The Paris Agreement relies on a robust transparency and accounting system to provide clarity on action and support by Parties, with flexibility for their differing capabilities of Parties. In addition to reporting information on mitigation, adaptation and support, the Agreement requires that the information submitted by each Party undergoes international technical expert review.
Global Stocktake	Art. 14	A “global stocktake”, to take place in 2023 and every 5 years thereafter, will assess collective progress toward achieving the purpose of the Agreement in a comprehensive and facilitative manner. It will be based on the best available science and its long-term global goal. Its outcome will inform Parties in updating and enhancing their actions and support and enhancing international cooperation on climate action.

Source: (UNFCCC, n.d.)

There are certain restrictions to the Paris Agreement. It might be argued that it is scientifically flawed, because the objective of keeping the earth's surface temperature below 2°C, preferable 1.5°C, is impracticable in light of the nations' INDCs. The Paris Pact has also been chastised for including stated objectives of "climate justice and sustainable development" in the preamble but not in the agreement itself. Similarly, explicit actions to operationalize the concepts of "equity" and "Common but Differentiated Responsibility" are missing (India missed out on the opportunity to assert its right to development in Paris, 2016). These limits, as well as specifics on transparency mechanisms, Monitoring, Reporting, and Verification, will be resolved at future Conference of Parties sessions (UNFCCC, 1994). Despite its present shortcomings, the Paris Agreement has been a huge political triumph. Previously divided by self-centered national conduct, the nations agree in the Paris Agreement to produce a decided collective effort based on national considerations, subjected to public openness and continuing progressive improvement on the agreed contribution. The Paris accord, like a soft regime in its early stages, relies on a naming and shaming strategy and consensual binding to ensure compliance. However, increasing looming negative effects of climate change, expanding expansion and influence of environmental organizations, and technical breakthroughs in the production and availability of renewable energy sources are some of the primary elements that will shift fossil-based economic society. This evolution might eventually turn this soft regime into a legally enforceable worldwide framework. The chances of the Paris Agreement succeeding in the future will improve if it is followed in documents and spirit (United Nation, 2016).

CHAPTER 5

Nepal's Policy Response on Climate Resilience

It is claimed that 70 percent of world states recognize climate change as a security threat (Khan, 2015). It is important to remember that climate change, with its severe life-limiting effects, might threaten Nepal's survival or, at the very least, seriously damage its governance structure, exacerbating the country's socio-political difficulties due to its insufficient adaptive capacity. In the 2014 worldwide index of fragile states, it is ranked fourth among the most vulnerable states (UNDP, n.d.). Climate change is a major issue in Nepal, and it is regarded as a "fundamental component" of the country's economic growth model, which includes decreased poverty and improved human situations (Agrawala, 2003). As a result, climate change is inextricably linked to all key national economic initiatives, including the Fifteen Periodic Plan (2019/20-2023/24). The inclusion of climate change in various policy frameworks demonstrates the magnitude of the problem and underscores the importance of a multi-sectoral response including stakeholders from the federal to local, public to private sectors. Despite rising recognition that climate change is a national security concern, the urgency and dedication required to address a securitized issue are still largely absent from Nepal's decision-making processes.

On October 10, 2016, Nepal joined the Paris Agreement, pledging to keep global temperatures below 2 degrees Celsius (Nepal ratifies Paris climate agreement, 2016). This chapter, based on notable policy documents such as the National Climate Change Policy (NCCP, 2019), National Framework for Local Adaptation Plan for Action (LAPA, 2011), Nepal SDGs Status and Roadmap 2016-2030, and the Fifteenth Periodic Plan (2019/2020-2023/2024), examines Nepal's policy response for sustainable development in the context of climate change. The topic matter of the submitted Intended Nationally Determined Contribution (INDC) 2016 is mostly derived from the policy papers listed.

In Nepal's policy line, however, the INDC is more plain and explicit. Economic growth is a goal, but the country also needs foreign assistance in attaining climate-friendly, long-term development.

An "overarching framework," as defined by the NCCP, stresses the negative effects of climate change and the necessary mitigation actions. It's a basic policy document with a clear aim and set of objectives. The SDGs Status and Roadmap (2016-2030) delineates the implications of climate change on several sectors and offers appropriate adaptation and mitigation actions. The subject of climate change outreach is derived from these two documents and is included into numerous national policy documents. Despite the existence of current critical policies and structures such as a ministry, a climate change strategy, and an implementation framework, climate change necessitates a proactive response in the face of oncoming risks. Climate change, with its far-reaching consequences, necessitates its mainstreaming in sectoral policymaking, particularly in the most sensitive sectors of energy, water, and agriculture (NCCP, 2019).

The NCCP and the fifteenth periodic plan (2019/2020-2023/2024) provide measures to mitigate the effects of climate change, whereas the SDGs Status and Roadmap (2016-2030) in terms of climate change is primarily concerned with maintaining consistent economic growth in the climate-driven age of implications. The goal of the fifteenth periodic plan is to evolve a just and harmonious society in the country through promotion of a vibrant and equitable economic growth without overexploitation of natural resources and fair distribution of development dividends to all; in particular to the marginalized, poor, and vulnerable in society and future generations. (NPC, 2019). The INDC (2016)'s highlighted goal encompasses both inter-generational and intra-generational equity. Inter-generational equity refers to the present generation's consideration of future generations' needs when exploiting natural resources, whereas intra-generational equity refers to bridging the resource scarcity gap between the affluent and poor of the current generation (Baker, 2006). The fifteenth periodic plan covers a wide range of issues that contribute to economic progress or, if left unaddressed, might halt it, as well as potential viable solutions for greater success. The fifteenth periodic plan covers economic, social, and environmental issues, with a distinct chapter on climate change, which is referred to as an "emerging issue" in the plan. The National Climate Change Policy (NCCP) is a critical step in realizing Nepal's environmental and development goals (NCCP, 2019). Its goal is to contribute to the nation's socioeconomic success by establishing a climate resilient society. Apart from this ideal, NCCP outlines seven goals, which are summarized in the table below:

Table 2 Seven Objectives of the NCCP (2019)

1	To enhance climate change adaptation capacity of persons, families, groups and communities vulnerable to, and at risk of climate change
2	To build resilience of ecosystems that are at risk of adverse impacts of climate change
3	To promote green economy by adopting the concept of low carbon emission development
4	To mobilize national and international financial resources for climate change mitigation and adaptation in just manner
5	To conduct research, make effective technology development and information service delivery related to climate change
6	To mainstream or integrate climate change issues into policies, strategies, plans and programs at all levels of State and sectoral areas
7	To mainstream gender equality and social inclusion (GESI) into climate change mitigation and adaptation programs"

Source: NCCP, 2019.

Evaluating Nepal's reaction to sustainable development in the context of climate change necessitates evaluating the essence of climate resilient development, which is a key aim of the NCCP in connection to sustainable development. The comprehension of these two and their interaction will aid us in evaluating efforts for sustainable development in light of the policy stipulations outlined (NCCP, 2019).

5.1 Climate Resilient Development: Goal of National Climate Change Policy

As previously established, sustainable development entails achieving thriving social, economic, and ecological systems, all of which are intimately intertwined. The ecosystem ensures human's existence and prosperity by providing services such as clean air and water, food, and fuel. Excessive and irresponsible exploitation of natural resources by humans reduces the availability of essential ecosystem services, with negative consequences for human survival. Such negative implications, such as a shortage or lack of good ecosystem services, are referred to as "resilience loss" (Folke et al., 2002). As a result, resilience is employed as a frame to delimit the broader

dimensions of sustainable development, which include seventeen (17) development goals, one of which is climate action (Sustainable development goals 2015-2030, 2016).

Climate resilient development—National Nepal's Climate Change Policy goal—ensures continuous delivery of ecosystem services in the face of oncoming climate challenges without compromising economic growth. As a result, resilience is a cornerstone of long-term growth.

The idea of sustainable development was developed to address poor countries' concerns about attempts to stifle their right to growth on the basis of a healthy global environment (Schoenbaum, 2006). All main international environmental understandings recognize sustainable development, a conceptual attempt to integrate right to development in a symbiotic connection with environmental concerns: Climate change convention and Kyoto Protocol—Clean Development Mechanism (CDM) (Rogers, 2008).

Climate resilient development, on the other hand, refers to development paths that combine adaptation and mitigation with strong institutions to achieve long-term sustainability (Denton et al., 2014). It entails policies and measures to mitigate climate change and its effects, as well as effective adaptation and risk management in the face of climatic catastrophes. Brown (2016) claims that resilience is essential to conceiving and implementing sustainable development." Resilience is a novel approach to sustainable development that takes into consideration the complex interplay between climatic, social, and ecological development. It is defined as "iterative continuously changing systems for managing change (Denton et al., 2014).

A high-level panel study titled "Resilient People, Resilient Planet: A Future Worth Choosing (2012)" further strengthens the relationship between sustainable development and resilience . It describes resilience as at the very heart of sustainability (Brown, 2016). Brown connects resilience and sustainable development primarily because both are controversial concepts that are changeable, focus on technological solutions while downplaying social and political ones, and promote "business as usual" framing (Brown, 2016).

In essence, resilience is synonymous with adaptation to severe climatic effects, since it aims to preserve equilibrium in the face of danger, shock, and disruption. Climate resilient routes focus on

one distinguishing variable: vulnerability, in terms of risk reduction (Denton et al., 2014). It entails actions to reduce vulnerability in the context of development needs and resources; capacity building for vulnerability reduction and coping with unexpected threats; monitoring vulnerability reduction efforts; and consistent revision of such responses based on learned experiences for continued improvement. Brown and Denton remark that the idea of resilience has a much broader socio-ecological context since it includes the mitigation process (Brown , 2016; Denton, 2014). Brown defines resilience as having three primary dimensions: the ability to "bounce back" after a calamity, the ability to adjust to unpredictability and uncertainty, and the needed positive structural transformation (Brown, 2016). Brown, on the other hand, believes that this idea is not without social distinction and debate. Climate resilient development, at its core, is based on a number of complex concepts: mitigation to keep climate change moderate; adaptation, a response strategy to anticipate and cope with climate change impacts that are unavoidable or cannot be avoided for various reasons; and capacity for effective risk management measures (Denton, 2014).

In the context of climate change, the similar link between climate change and sustainable development is drawn (Rogers, Jalal, & Boyd, 2008). In a nutshell, Denton et al. and Brown (2016, p. 246) broadly agree and divide climate resilient development into two main action frames:

“ Actions to reduce human-induced climate change and its impacts, including both mitigation and adaptation toward achieving sustainable development

Actions to ensure that effective institutions, strategies, and choices for risk management will be identified, implemented, and sustained as an integrated part of achieving sustainable development.”

This comprehensive definition broadens the scope of stakeholders engaged in achieving successful resilience. It is necessary to improve capability against catastrophes and crises at all levels, from the state to local communities and people. Aside from the ability to withstand shocks and strains, the endangered system must recreate itself on more solid and stable foundations. Brown and Denton, emphasizes the three key elements of the Rockefeller Foundation definition: the ability to cope with disasters, the capacity to recover from them, and the equally important but often

overlooked third factor: the ability to transform—radically change in order to take advantage of new opportunities and new possibilities (Brown, 2016; Denton, 2014).

The Rockefeller Foundation concept, with its encompassing nature, represents the inherent needs of resilience, which requires a multi-faceted, multidisciplinary strategy, as Martin-Breen and Anderies point out in their review of resilience literature. Brown summarizes resilience as successful "proactive adaptation and anticipatory action"— "developing ability to deal with and influence change (Brown , 2016, p. 235)." Denton et al. concluded that climate change adaptation and mitigation, as well as sustainable development efforts, must complement and contribute successfully to one another, since one has the potential to negate the other (Denton, 2014).

Climate resilient paths usually need transformation—innovative systemic solutions that question some of the assumptions that underpin business-as-usual methods or gradual efforts to realize sustainable development (Denton et al., 2014). There's a difference between the two: Transformational adaptation entails altering the type, composition, or location of the vulnerable system, whereas incremental or business-as-usual adaptation focuses on current practices, techniques, and technology to handle present and projected challenges. In the absence of comprehensive climate resilience measures, such as mitigation to lower extreme climatic conditions and adaptation, as well as developing capacity to mitigate the consequences of remaining abrupt climate changes, climate change is seen as a danger to sustainable development (Denton et al., 2014).

It is critical to change the methods, procedures, and attitudes that impede good climate and social stability. The goal of climate resilient development is twofold: resilience and long-term sustainability. "A system's capacity to predict, mitigate, accommodate, and recover from disturbances in a timely, efficient, and equitable way," according to IPCC (2012), as cited by Denton (Denton, 2014). Simply put, sustainable development is "development that fulfills current demands without jeopardizing future generations' ability to satisfy their own needs."

For the ultimate objective of climate resilient development, these two connected and interdependent ideas must synchronize their suggested policies and practices. In order to achieve human well-being and a sustainable connection with a restricted physical environment, reconciling

trade-offs among economic, environmental and other social goals through fair and participatory institutional systems is required (Denton et al., 2014). These qualities underline the need for a coordinated, comprehensive strategy to climate resilient development that can bring diverse elements of development together and include different stakeholders on an equal footing. Equal participation encourages the growth process. Most importantly, climate resilient development is an evolutionary process that will improve its ability to prevent shocks and foster long-term growth as more knowledge is gained.

Carbon intensive development, or, as Baker puts it, the "traditional western development model," is not only contributing aggressively to adverse climate change, but it is also largely "incompatible" with the goals of sustainable development, such as poverty reduction, food and livelihood security, and improved human health (Baker, 2010. p. 234). Adopting consumption patterns that enrich socio-economic growth with decreased use of natural resources and continuing ecosystem services—thus, maybe less emission and kept healthy environmental adaptive capacity—is required to provide sustainable development and climate resilience. A distinction between human well-being and material consumption is required to pursue consumption dynamics that realize socio-economic growth without jeopardizing the sustainability of natural resources and ecological services (Baker, 2010).

Climate change resilience measures and development policies are inextricably connected. Climate change consequences, if not assessed and included into development policy, would hinder development efforts. Drawing a relationship between climate change, sustainable development, and disaster assistance, Christiana Figueres, executive secretary of the United Nations Framework Convention on Climate Change, underlines that the three are "all one and the same" (UNFCCC, 2015). She emphasizes that sustained growth and effective poverty reduction are hard to achieve in the face of catastrophic natural disasters that might wipe out whole provinces and displace millions.

Climate change mitigation minimizes harsh weather, but adaptation improves the ability to adapt to the remaining changes, resulting in a sound development. Another factor that establishes a cross-cutting link between development policies and climate mitigation or adaptation is a

reinforced understanding that development processes shape vulnerability determinants to adverse and abrupt climate changes, as well as the development of an effective response strategy for them. People and countries with limited resources, financial restraints, and political disturbances may see their issues worsen as a result of ignored climate change, which will act as a danger multiplier. The preceding chapter goes over climate change as a danger multiplier in depth (UNFCCC, 2012).

As a result, in addition to sudden and frequently detrimental climate changes, development strategy must include the socioeconomic restrictions of sensitive places as factors of susceptibility. Another compelling argument to link climate resilience and sustainable development is that many climate drivers—most notably, energy production and consumption—and mitigation strategies are essentially the same. Denton argues that emphasizing sustainable development in policy formulation will better serve climate change mitigation and adaptation in light of this reciprocal positive link (Denton, 2014). Furthermore, an integrated strategy to climate change mitigation and adaptation, with each aim contributing meaningfully to the other, would ensure that sustainable development is achieved.

It is critical to address developmental structural inadequacies that increase vulnerability and restrict adaptation capability of underprivileged parts of society in order for climate resilient development to emerge (Denton et al., 2014). Understanding structural disparities and their remedies has widened the definition of poverty to include its interconnections with socio-political variables such as political empowerment, participation, and individual dignity (Olsson et al., 2014). The notion of livelihood is also crucial. "Living conditions" are defined as "access to natural, human, physical, financial, social, and cultural capital (assets); the social relations people use to combine, integrate, and expand their assets; and the ways people deploy and enhance their capabilities to act and make lives meaningful" (Olsson et al., 2014, p. 124). A successful livelihood is defined as one that "transforms assets into income, dignity, and agency, to enhance living conditions, a precondition for poverty reduction, and is capable of responding to changing environments." Given the fact that climate change disproportionately affects the poorest members of society, achieving climate-resilient development involves extending the decision-making process to include more people—"deliberative democracy." Different stakeholders' beliefs,

concerns, and perceptions would raise "ethical effects," which are necessary for achieving agreement and taking urgent climate action (O'Neill, 2009).

5.1.1 A Resilience Lens and Climate Change Sustainable Adaptation

From a resilience viewpoint, new insights for knowledge and policy are provided, and more transformational responses to environmental change are supported (Brown, 2016). It has not only become an essential component of sustainable development, but also a prism through which climate change adaptation has switched from reducing vulnerability to increasing adaptive capacity. In the context of the resilience framework, vulnerability is always present in the system (Nelson et al., 2007), and the goal of adaptation should be to eliminate sources of vulnerability, establish an acceptable norm, and develop appropriate responses to risks and shocks. The nature of these responses, whether short-term coping or long-term sustainability, is determined by three criteria (Brown, 2016).

At first place, it is critical to comprehend how the problem is defined, followed by an assessment of the institutional structure of the response process, and ultimately, feedback and its assimilation into actions. The final one is crucial since feedback leads to more detailed specification and improved complete social learning of the issue (Brown, 2016). In contrast to narrowly framed challenges, a comprehensive and inclusive approach to the multi-layered issue of climate change yields prospectively efficient and productive consequences.

Climate change adaptation, according to Brown, has become a "central concern" of international development. Its importance in a world endangered by catastrophes is recognized by development agencies ranging from international financial institutions to non-governmental organizations. The establishment of the Climate Change Adaptation Fund is a good example of the world's rising understanding and awareness of the need for coordinated adaptation measures to mitigate the negative effects of climate change. This initiative serves to galvanize efforts to operationalize and mainstream climate change adaptation into development frameworks (Brown, 2016).

Remarkably, the international climate change regime for addressing vulnerable population adaptation concerns primarily relies on transferring improved technological skills and financial

assistance to governments, while the underprivileged self-reliant threatened communities continue to lurch and rely on self-help (Brown, 2016). Because of the disparity between foreign finance, government development policies, and vulnerable populations, academics like as Jessica Ayers (2010) have questioned the supposed inclusive nature of common adaptation methods. Ayers claims that climate change policy agendas and actors seek adaptation focusing on "interventions" to alleviate the implications of climatic shocks for the most vulnerable populations, dividing it into three categories. The second method of adaptation aims to alter development patterns in order to make it more resilient. The third paradigm promoted by development organizations, on the other hand, views adaptation as development (Ayers, 2010).

The sustainable adaptation strategy connects climate change to other social and environmental challenges, necessitates a coordinated response, and "attempts" to position adaptation within a larger framework of sustainable development (Brown, 2016). The term "sustainable adaptation" was coined to describe a broad definition of vulnerability that includes poverty and inequality as fundamental causes. Climate change is a "systemic and basic problem" of unsustainable growth patterns, according to this notion of sustainable adaptation (Eriksen et al., 2011). Poverty, marginalization, and climate consequences are all connected, however with distinct dividing lines; the poor are not all equally affected by climate change. The impossible inseparability of poverty, vulnerability, and climate change impacts leads Tanner and Mitchell (2008) to advocate for pro-poor climate adaptation, a proactive process that would include measures such as social protection, conflict prevention, and service delivery in addition to addressing climate impacts. Pro-poor adaptation is defined as a holistic approach to the interrelationships of poverty, vulnerability, and adaptability that helps individuals escape chronic poverty.

5.2 Nepal's Path to Climate Resilient Development

The examination of climate resilient development in the context of resilience as a concept and its link to sustainable development leads to certain key conclusions. At the heart of sustainable development is the successful institutionalization of mitigation and adaptation measures with the support of competent institutions to offset adverse climate impacts and boost adaptive ability of vulnerable sectors of society. Climate change, as outlined in the preceding chapter, poses major

concerns and has resulted in catastrophic losses of life, infrastructure, and population displacement. In the lack of climate resiliency, development is unsustainable. Climate resilient development, which ensures sustainable growth in the face of climate hazards, necessitates a comprehensive plan, a multi-sectorial approach, and broader stakeholder participation, from the individual to the larger society. Another critical requirement is to address fundamental developmental weaknesses that restrict adaptive capacity and increase susceptibility, particularly among the less fortunate who are more vulnerable to climate change. It is critical to maintain these fundamental criteria for climate resilient development in mind in order to comprehend Nepal's policy aim of actualizing climate resilient development.

5.3 Review of Nepal's Policy Frame

In light of the disastrous effects of climate change, Nepal's response to climate change is described in the National Climate Change Policy and the Fifteen Periodical Plan as characterized by an appropriate policy with legal and institutional support and is streamlined into workable, implementing strategies and programs. However, a more complete strategy must keep up with changing technical advancements and social and economic imperatives and evolve accordingly. As previously stated, the NCCP and its Climate Change Implementation Framework provide an overall policy framework that highlights Nepal's vulnerable areas, including water, food, and energy, and proposes necessary remedies. A quick comparison of the NCCP to other policy instruments is offered below to demonstrate that the national climate policy is effective. The NCCP, a comprehensive policy document, is the result of multilevel implementation councils and working groups' lengthy debates (NCCP, 2019). NCCP lays out objectives, identifies upcoming risks to several susceptible sectors, including energy, food, and water scarcity, tourism, and health, and offers a variety of mitigation and adaptation actions in order to achieve climate resilient development. Apart from disaster preparedness and addressing socio-economic vulnerability to improve adaptive capacity, the adaptation strategies include actions linked to water resources, forestry, human health, biodiversity, agriculture and livestock, and fragile ecosystems.

5.4 Adaptation

5.4.1 Water Crises

Rising temperatures, along with increased evapotranspiration and glacier melting, will result in early bursts of flow, but eventually ebbing water availability. Changes in water supply, demand, and resource availability are all consequences of climate change on water resources (Nicol, 2020). In other parts of the world, however, climate change is expected to increase household and industrial water use by less than 5percent by the 2050s (Bates, 2008). Goal 6 of the Sustainable Development Goals (SDGs), clean water and sanitation, recognizes water security as a key life-sustaining asset. NCCP recommends numerous steps to assure water security and availability, which are essentially classified into four key goals: increase water storage and infrastructure, water conservation, a strong emphasis on an integrated water management system, and capacity enhancement. These four aims, which are closely related to effective water usage, distribution, and conservation, are believed to necessitate legislative framework and public awareness. The NCCP covers a wide range of actions to provide an effective and productive water management system in Nepal, from waste water recycling to improving current water distribution infrastructure to building water reservoirs. However, the policy framework is lacks the idea of water price, which is known to help with water conservation by encouraging efficient irrigation water usage and the development of water-efficient crops.

5.4.2 Agriculture and Livestock

Similarly, after emphasizing the importance of agriculture in Nepal's economy, the NCCP highlights the negative effects of climate change on agricultural and livestock. Ensured agricultural productivity is a precondition for achieving the non-SDG—no hunger. In the last chapter, we discussed how important agriculture is to Nepal's socioeconomic growth. Nepal is predominantly an agro-based economy, according to NCCP , with agriculture accounting for 26percent of GDP (Financial survey 2077/78). Aside from affecting water availability, higher temperatures would have an impact on agricultural growth cycles (NCCP, 2019). The policy recommendations for coping with negative climate impacts on agriculture are grouped into four areas. Impending implications on crop yields, novel crops that are more adaptive to such unfavorable impacts, and detecting patterns to unpredictable water supply are all critical research

areas to be investigated. The second feature of agricultural adaptation strategy is the acquisition of necessary technologies to implement effective water and cultivable land usage for increased production. Various adaptation strategies are recommended under the subtitle general management, ranging from expanded study on increased agricultural production and improved livestock to financial help to farmers for greater yield (NCCP, 2019).

5.4.3 Health and Forestry

NCCP includes health and forestry, as well as their susceptibility to climate change and recommended remedies. It discusses how rising temperatures, changing precipitation, and extreme weather events are putting Nepal's health at danger, resulting in deaths, injuries, and vector-borne illnesses. As an SDG 3, well health must have precedence. NCCP prioritizes developing adaptive capability in response to identified vulnerabilities, increasing public awareness, and incorporating them into national health policy (NCCP, 2019). Climate change would have a detrimental impact on Nepal's rapidly dwindling forest cover, another threatened resource. SDG 15, ensuring a healthy forest cover, is an important part of living on land. Receding forests results in less agriculture output, changed species' composition, more flood, and enhanced vulnerability to biodiversity. NCCP emphasizes the importance of research, public education, improved forest governance and management, and the prevention of soil erosion and other forest harms. The goal of these policies is to increase forest cover, enhance their potential benefits, and provide alternative resources to people who rely on them (NCCP, 2019).

5.4.4 Biodiversity and Vulnerable Ecosystem

According to NCCP, the SDG 15-life on land includes the protection of biodiversity and fragile ecosystems. Mountain regions, rangeland, desert and hyper-arid areas, and wetlands all face imminent risks to biodiversity and other fragile ecosystems. Nepal's rich but underdeveloped natural ecosystem has a lot to offer in terms of growth, development, and poverty reduction (Fifteenth Periodic Plan, 2019). The deterioration of natural resources—alarming deforestation, air, water, and soil pollution—makes disastrous climate change much more likely. Various studies, such as Nepal's Fifth National Report to the Convention on Biological Diversity, 2014, and the Rio Stocktaking Report, 2012, recognise this reality. Despite the existence of policies and

institutional frameworks, however, the continuous degradation of the natural ecosystem has not been adequately addressed (Kakakhel, 2012). Climate change and ecosystem and resource management are inextricably linked, since their mutually beneficial interaction leads to long-term growth. The rising threat of climate change will exacerbate the natural ecosystem's deterioration in Nepal, limiting choices for growth and development. With this understanding, the conversation around climate change and natural ecosystem preservation is shifting from "impact driven" to "green economy," in which "climate change effects are addressed by climate proofing economic sectors and the resources they rely on, and providing a policy and regulatory framework for low emissions innovation and green growth" (Fifteenth Periodic Plan, 2019). Such an idea, however, has not been adequately incorporated into the mainstream development paradigm. With an increasing knowledge of the link between poverty and environmental change, it is becoming more important to safeguard ecosystems, particularly those on which poor people rely. This necessitates a review of "ecosystem and natural resource management efficacy in terms of contributing to poor climate resilience" (Government of Nepal, 2014, p.15).

5.4.5 Disaster Management

The most significant part of climate resilient development is disaster preparedness, which is defined in the National Policy for Disaster Risk Reduction, 2018. Extreme weather events are expected to become more often and intense, and the effects of climate change are already being felt. Unavoidable calamities, on the other hand, might be mitigated by efficient adaptation. Climate action, SDG-13, emphasizes disaster preparation. The NCCP suggests a "holistic approach" that includes allocating funds and resources to Disaster Risk Reduction Management (DRRM), clearly defined lines of responsibility and coordination, early warning systems in case of calamities, community evacuation, and prepared responses to glacial lake outbursts and other untoward disasters (NCCP, 2019). The DRRM has been founded as an organization with provincial and municipal support and well defined principles as outlined in the NCCP (2019). The relevance of these concepts is summarized in the table below:

Table 3 Objectives of National Policy for Disaster Risk Reduction 2018

- To increase understanding on disaster risk and ensure the access of information related to the disaster risk at all levels,
- To strengthen disaster risk governance for disaster risk reduction and management,
- To mainstream disaster risk reduction in all development processes by integrating it with climate change adaptation activities,
- To enhance disaster resilience by increasing public and private investment in disaster risk reduction,
- To make disaster preparedness and response effective by improving disaster information management system and developing and expanding multi-hazard early warning system,
- To ensure “Build Back Better” approach for post-disaster recovery, rehabilitation and reconstruction.

Source: MoPE, 2018

The assessment of these goals demonstrates a thorough, inclusive approach to achieving the intended long-term growth and development. Because climate change impacts are known to have a particularly negative impact on the poor and disadvantaged, DRRM focuses on mainstreaming disaster risk reduction into all development processes by combining it with climate change adaptation measures. The necessary capacities for decreasing vulnerability and increasing resilience are dependent on useful knowledge and technology that match to indigenous wisdom as well as the applicable social, cultural, economic, and environmental context. Above all, climate change is a complicated global issue that need collaboration among numerous local and international stakeholders in order to achieve sustainable development and catastrophe risk reduction.

5.4.6 Human Development

Sound human development is unquestionably an effective barrier against natural threats becoming disasters. Communities with widespread malnutrition, deep levels of poverty, inadequate access to education, landlessness, discrimination against women and minorities are clearly more at risk and more difficult to recover (Public discourse analysis, 2013). With the possibility of climate-related disasters increasing, Nepal's poor adaptation system has become an eyesore. Disaster risk reduction and climate adaptation concepts must be consistently integrated into all public development plans (NPC, 2019). In order to achieve the desired sustainable development, disaster risk reduction and management in Nepal: delineation of roles and responsibilities emphasizes development policies in Nepal to focus on reducing disasters, improving adaptation capacity, and prioritizing the needs of vulnerable communities in reconstruction and development plans (Bhandari, 2020).

Because of the detrimental consequences of climate change, NCCP stresses the rising hardship of the poor and women—social classes that appear to be primarily disadvantaged, disempowered, and reliant on natural resources for existence (NCCP, 2019). In the face of future climatic challenges, poverty reduction, a natural result of economic progress, will become impossible. Similarly, a big portion of Nepal's rural women rely on agriculture for survival, and lower agricultural production would limit their development chances even further. NCCP proposes adaptation measures such as an inclusive approach involving these underprivileged sections of the community, their access to technology, the evolution of a poverty-climate nexus, highlighting adverse effects of population growth, and the development of a large-scale decision-making process involving these vulnerable classes.

5.5 Mitigation: Challenges and Opportunities

After a long list of adaptation strategies, the NCCP concentrates on mitigation. Because Nepal contributes the least to greenhouse gas emissions but has tremendous unfavorable consequences and adaptation issues, NCCP is largely focused on adaptation. With a contribution of 0.027 percent to world emissions, according to the Ministry of Population and Environment (MoPE), This demonstrates that energy, a critical component of economic growth and national development,

requires refinement in terms of efficiency, application, and nature. Total GHG emissions from energy, industrial processes, agriculture, and waste (excluding LULUCF) were calculated at 29,347 CO₂-eq Gt in 1994, but fell to 24,541 CO₂-eq Gt in 2000. However, overall GHG emissions in 2008 totaled 30,011 CO₂-eq Gt, slightly higher than the 1994 level. As a signatory to the United Nations Framework Convention on Climate Change (UNFCCC), the country seeks and supports efforts to keep global warming well below 2°C, with a target of 1.5°C over pre-industrial levels, in order to mitigate the risks and negative effects of climate change (MoPE, 2016). "The expansion of renewable energy resources, as well as an increasing proportion of nuclear and hydroelectric power, give a chance to minimize carbon emissions in Nepal's energy sector," according to the national policy (NCCP, 2019). Energy production isn't the sole issue; NCCP emphasizes the necessity of energy efficiency and conservation and recommends a number of solutions (NCCP, 2019).

According to NSDS (2019), an "emission space" is beneficial in light of predicted future economic development. Nepal aspires to transition from a developing to a developed country by 2025 (NPC, 2019). Integrating carbon mitigation alternatives into future development plans is a potential technique for achieving economic expansion without compromising environmental soundness. According to the Fifteenth Periodic Plan, "lower carbon trajectory" economic growth can be achieved "by incorporating a host of carbon mitigation options and measures into its future development plans – for which a large latent potential exists if aided by adequate finance and appropriate technology" (NPC, 2019, p. 24). This issue is emphasized in the newly filed INDC, which also states that without financial and technological help, the appropriate degree of mitigation or clean energy targets would be unrealized. The Forestry Sector Strategy (2016-2025) intends to increase Nepal's forest carbon stock by at least 5 percent by 2025 compared to 2015 levels, and to reduce the mean annual deforestation rate by 0.05 percent from 0.44 percent and 0.18 percent in the Terai and Siwalik hills, respectively. By 2025, it also wants to have a forest carbon trading and payment mechanism in place, as well as mainstream community/ecosystem-based adaptation (MoPE, 2016). The National Planning Commission's Needs Assessment, Costing, and Financing Strategy for Sustainable Development Goals calculated the financial resources needed to execute the SDGs in Nepal and highlighted viable resource sectors. According to the research,

Nepal would require an average of 2025 billion rupees each year to accomplish the SDGs. The yearly average amount required for investment is anticipated to be NRs. 1111 billion from the government sector, NRs. 739 billion from the private sector, NRs. 87 billion rupees from the cooperative and non-governmental sector, and NRs. 88 billion from the households' sector. The yearly average gap will be NRs. 585 billion, with the government and private sector each contributing NRs. 218 billion and 367 billion (NPC, 2019).

According to NCCP (2019), emissions will be reduced over time. To achieve this, NCCP will continue to set and meet annual afforestation and reforestation targets, stop illegal and corrupt forest resource abuse, provide alternative resources to forest-dependent communities for livelihood, and seek financial assistance from international financial institutions to develop a national forest conservation and restoration strategy (NCCP, 2019). A successful mitigation program must rely on both renewable and efficient energy sources and increased carbon sink capacity.

5.6 Institutional Structure

The awareness that Nepal's ability to successfully pursue its desired goals in international climate discussions is hampered by a lack of human resources and institutional capacity is the most critical part of national climate change strategy. It must examine emerging dangers thoroughly and devise an appropriate reaction. NCCP (2019) emphasizes an integrated and coordinated framework by establishing climate cells in various sectors at the federal and provincial levels, establishing a coordination commission, ensuring that climate change ideals and socioeconomic development goals complement one another, incorporating climate change concerns into Environmental Impact Assessment (EIA), and conducting a systemic regular assessment of emission reduction and land use changes. Nepal is focusing on institutional strengthening as well as institutional build-up in order to implement climate change and reduce emissions from deforestation and forest degradation plus (REDD+) programs. Simultaneously, the Ministry of Population and Environment's Climate Change Management Division and the Ministry of Forest and Soil Conservation's REDD Implementation Centre are working to establish the essential conditions for the UNFCCC's provisions to be implemented effectively (MoPE, 2016).

NCCP fosters widespread public awareness of imminent climate hazards to generate support for adaptation in order to achieve effective implementation of climate change policy goals. Cultivating this mentality among prominent public sectors not only absolves them of their obligation to address the problem, but it also inhibits a comprehensive and collaborative solution (NCCP, 2019). The inclusion of important stakeholders in issues such as water and energy conservation, forest and biodiversity protection, and CDM opportunities are among the many areas that necessitate an inclusive strategy, which is based on large-scale participation. In a similar spirit, international and regional collaboration is essential since no one country can meet the problems of climate change. NCCP recognizes that global collaboration and establishing a collective approach among South Asian governments are critical, as the area is particularly susceptible to harmful climate change. Continued data exchange, active response and links with international environmental institutions, joint assessment of climate impacts and devising a sustainable approach to climate change among mountainous states, establishment of a research body, and exchange of expertise and students to promote understanding regarding the issue of climate change are all needed to achieve this goal (NCCP, 2019).

Nepal is one of the poor countries that has been identified as being disproportionately affected by climate change. It qualifies for the promised worldwide Green Climate Fund as a signatory to the UNFCCC and a World Bank member. However, obtaining a part of this money is contingent on the creation of a "enabling environment" (NCCP, 2019). NCCP argues for initiatives such as establishing a Nepal Climate Change Fund, combining public-private-civil-society efforts to finance and implement mitigation and adaptation projects, and providing carbon market possibilities with an appropriate investment framework to create this enabling environment. NCCP correctly recognizes that developing countries compete for climate change fund opportunities provided by the Green Climate Fund (GCF), Clean Development Mechanism (CDM), Adaptation Fund (AF), Global Environmental Facility (GEF), World Bank's Forest Carbon Partnership Facility (FCPF), and Carbon credit trading. Another important adaptation necessity for underdeveloped countries is their technological limitations. The international climate regime—UNFCCC—requires the transfer of technologies from developed to underdeveloped countries. NCCP proposes measures such as determining national technological needs for mitigation and

adaptation, incorporating local technology, and seeking technological breakthroughs in areas such as coal, biofuels, and clean coal technologies; technology transfer for designing electric/hybrid vehicles; and exploring viable productive sites for wind and solar energy generation.

5.6.1 Institutional Mechanism

The NCCP reflects the notion that policy must be accompanied by an action plan (2019). However, an institutional framework that is systematically integrated across diverse sectors in the national policy and decision-making structure is required to implement the action plan. NCCP suggests creating "Climate Change Policy Implementation Committees" at the federal, provincial, and municipal levels to monitor and upgrade the national climate change policy on a regular basis. A broad-based committee composition is advocated for successful outcomes, with the respective minister of climate change as chair, secretaries of connected ministries as members, and representatives from business sectors, civil society, and specialist individuals (NCCP, 2019). Nepal's National Climate Change Policy contains measures and commitments related to the country's stated objective of achieving sustainable development and addressing the worldwide threat of climate change as a responsible member of the international community.

CONCLUSION

Climate Change is defined as the protracted changeable interaction of the seas, atmosphere, biosphere, and polar regions over a long period of time. This instability manifested itself as a rise in earth's surface temperature, known as global warming, which triggered a cascade of various unanticipated and generally dramatic changes in the global climate system. The melting of glaciers has been triggered by rising global temperatures, resulting in sea level rise and, eventually, water shortages. The hydrological cycle and oceanic circulation have been disrupted, as well as the severity and unpredictability of weather patterns, posing a major threat to life.

The United Nations Framework Convention on Climate Change (1992) was a watershed moment in human-induced climate change, which was ascribed to rising greenhouse gas concentrations in the atmosphere. The UNFCCC tried to stabilize greenhouse gases, calling it "dangerous anthropogenic intervention.". The suggested solution was based on the CBDR concept, with the developed states bearing primary responsibility due to their historical involvement for the problem, as well as their financial and technological supremacy and ability to solve it. Many mechanisms like IPCC, Kyoto protocol, Paris Agreements are key instrument to solve it.

Nepal's multi-layered difficulties, such as unfriendly neighbors, a poor economy and institutions, and rampant corruption, are exacerbated by the present climate-related disasters and environmental stressors, which are putting human life at risk. Internal chaos wreaked by vested interests turning into an aristocratic control of government is more frightening than foreign dangers in Nepal, which has existed in a difficult environment from its birth. Climate catastrophes and environmental stressors are compounding existing constraints to growth, development, and security, putting Nepal on the verge of collapse. Global climate change is exacerbating Nepal's current challenges and difficulties, thereby expanding the national security area to include human security: increased societal vulnerability and endangered ecological resilience.

Nepal, as a responsible member of the international community, signed the Paris Climate Agreement (2016), pledging to keep global temperatures below 2°C, ideally 1.5°C. Ratification of the Paris Agreement permits it to receive financial and technological help to increase its ability to

adapt to the negative effects of climate change. Nepal's National Climate Change Policy (2019), which focuses on low-carbon growth, aims to incorporate climate change in economically and socially sensitive areas of the economy in order to achieve climate-resilient development. Climate resilient development, often known as another approach to sustainable development, includes policies and practices for reducing negative consequences of climatic change by improving adaptive ability against climate disasters. The two sides of the climate resilient development coin are resilience and sustainable development.

Effective adaptation, on the other hand, necessitates the strengthening of local communities by increasing their awareness and capacity to mitigate the harmful effects of climate change. The transfer of power and resources from the federal level to the provincial and district/local levels is contentious. The vulnerable local sector requires enabling capability and reaction. Nepal has to establish a strong INDC that highlights its limitations, potential, and future mitigation and adaptation goals in quantifiable concrete targets in order to gain the respect of the world community, for whom climate change has become a rallying cry. A productive and effective mitigation strategy would include not just efficient energy production and consumption with a greater emphasis on renewables, but also an evaluation and price of existing carbon sinks such as forests. To materialize into effective activities, National Climate Change Policy demands bold, service-oriented mature political leadership. The role of exploitation in Nepal's political economy is clear, from the wood mafia to periodic contrived sugar and bread crises. Due to the policy's goal of transforming multiple economic sectors and old methods of utilizing natural resources, it may face opposition from vested national and international interest groups. As a result, creative political leadership that recognizes climate change as a security threat multiplier might take a strong stance against such institutional constraints.

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