Grassroots Climate Change Diplomacy

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Declaration
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FOREWORD

The Institute of Foreign Affairs announces the release of the book "Grassroots Climate Change Diplomacy," by Dr. Naresh Rimal. This work provides readers with invaluable insights into the practical challenges posed by the increasingly pressing issue of climate change. It sheds light on the alarming experiences faced by the Nepali people, highlighting the need for integrating grassroots diplomacy, even in the face of comparatively minor impacts when compared to more industrialized nations.

Dr. Rimal's research offers a critical evaluation of environmental shifts and conditions, achieved through the skillful use of analytical interpretations and stakeholder interviews, all grounded in a pragmatic investigative approach. The study encompasses both national and global perspectives, addressing substantial environmental concerns like forests and biodiversity, watershed and energy management, urbanization, and solid waste governance. These issues are intricately entwined with the complex dynamics of climate change. The recommendations put forth in this study aim to protect the nation and its residents from the adverse effects of climate change, emphasizing the pivotal role of grassroots diplomacy in traditional diplomatic practices.

The Institute extends its heartfelt gratitude to Dr. Naresh Rimal for his diligent and impactful research, acknowledging his contributions to the scholarly discourse on policy matters. Additionally, the Institute expresses its deep appreciation for Dr. Rimal's support of IFA's initiatives.

We acknowledge collective commitment and dedication of all IFA staff members involved in this endeavor. The significant contributions of Mr. Madhavji Shrestha, Mr. Matrika Poudyal (resource person), Mr. Sanu Raja Puri (information officer), Mr. Mahendra Prasad Joshi, Mr. Dron Prasad Lamichhane, Ms. Renuka Khadka is commendable.

Rajendra Pandey
Officiating Executive Director

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I extend my deepest gratitude to the Institute of Foreign Affairs (IFA) for their continued support in the process of preparing and publishing this report. When I approached IFA with the idea for this study, they responded promptly and offered valuable guidance, including the submission of a concept note, which laid the groundwork for this comprehensive work. IFA's understanding of the significance of this study in the realm of grassroots diplomacy played a pivotal role in shaping the research.

During the research journey that culminated in this book, we observed the transition from COP 26 to COP 27, with discussions surrounding loss and damage issues taking center stage. Although this report briefly touches upon this matter, I recognize that there is much more to explore in this evolving domain. I am genuinely appreciative of IFA for acknowledging the importance of delving into grassroots diplomacy, particularly in the context of these dynamic global conversations.

I extend my heartfelt appreciation to all the individuals who generously volunteered their time and expertise to provide valuable insights into the intricacies of grassroots climate change diplomacy, both in Nepal and on a broader scale. Each contribution has played an indispensable role in enriching the content and perspective of this work.

Furthermore, I wish to express my gratitude to Professor Emeritus Larry D. Smith from the USA and Wendy H. Hillman from Australia for their generous commitment of time and effort in reviewing the manuscript and providing invaluable comments that have significantly enhanced the quality of this study. Their insights have been of immense value. I am also deeply indebted to Ajay M. Dixit for his thorough reading and thoughtful critique of the manuscript, which undeniably contributed to its refinement. Additionally, I extend my thanks to the anonymous reviewer for their constructive comments and suggestions.

Finally, I must acknowledge the continuous support and encouragement I have received from IFA in all my endeavors. Your steadfast dedication to advancing knowledge and understanding in the fields of diplomacy and climate change is truly commendable.

Naresh Rimal, PhD
Author

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Acronyms

Asian Development Bank	ADB
Acute Respiratory Infections	ARI
Causal Loop Map	CLM
Central Bureau of Statistics	CBS
Center for Environment Management	CEM
Conference of Parties	COP
Department for International Development	DFID
Drivers, Pressures, State, Impact and Response	DPSIR
District Soil Conservation Office	DSCO
Soil Conservation and Watershed Management	DSCWM
Environmental Impact Assessment	EIA
Environment Protection Rules	EPR
Environmental and Social Impact Assessment	ESIA
Global Circulation Model	GCM
Gross Domestic Product	GDP
Global Environmental Change	GEC
Global Green Growth Institute	GGGI
Green House Gases	GHGs
Hindu Kush Himalaya	HKH
Hydroelectric Power Projects	HPPs
International Council for Local Environmental Initiatives	ICLEI
Initial Environmental Examination	IEE
International Finance Corporation	IFC
Intergovernmental Panel on Climate Change	IPCC
Multilateral Environmental Agreements	MEAs
National Adaptation Program of Action	NAPA
Nepal Climate Change Support Program	NCCSP
Nepal Climate Vulnerability Study Team	NCVST
Organization for Economic Co-operation and Development	OECD
South Asian Association for Regional Cooperation	SAARC
Sustainable Development Goals	SDGs
Short Lived Climate Pollutants	SLCPs
Solid Waste Management	SWM
United Nations Development Program	UNDP
United Nations Environment Program	UNEP
United Nations Educational, Scientific and Cultural Organization	UNESCO
United Nations Framework Convention on Climate Change	UNFCCC
United States Agency for International Development	USAID
World Bank	WB

महर्षीणां भृगुरहं गिरामस्म्येकमक्षरम् |
यज्ञानां जपयज्ञोऽस्मि स्थावराणां हिमालय: ||

- श्रीमद्भगवद गीता

maharṣhīṇāṁ bhṛigur ahaṁ girām asmyekam akṣharam
yajñānāṁ japa-yajño 'smi sthāvarāṇāṁ himālayaḥ

"I am the single syllable among words among the sages, O Bhargava, and I am the meditative repetition among sacrifices. Among the immovable, I am the Himalayas."

Chapter 1
Introduction

1.1 Context

The twenty seventh annual summit- Conference of the Parties referred as COP27 is the most recent annual United Nations Climate Change Conference. It addressed ramifications of climate change regarding both economic losses and non-economic damages. This gathering offers participant countries an opportunityto reflect on actions undertaken by developed nations and glean insights from their experiences. Developed countries role as major contributors to greenhouse gas emissions burdens them with primary responsibility for addressing climate change and supporting nations vulnerable to its effects.

Small nations encounter growing challenges in their long-standing efforts to combat corruption and support their citizens' responses to increasing climate-related problems despite limited resources and capacity. It is essential that addressing local burdens of climate change not rest primarily on small nations. Developed countries have historical green house gas emission-fed obligations to offer both real and financial resources, facilitate technology transfers, and establish and support capacity building initiatives to enhance these nations' responses to the new global realities for which they are, at most, minimally responsible. International cooperation and support play an instrumental role in assisting smaller nations. Thus, developed countries, international organizations, and the global community at large should not only extend financial aid, but also share technical expertise, and encourage

close collaboration with smaller nations to combat corruption, fortify governance frameworks, and institute robust mechanisms aimed at protecting citizens from climate-induced calamities.

In the context of developing countries, the safety and well-being of their citizens should assume primacy. Pursuing climate change mitigation and adaptation measures guided by altruism can prove a potent instrument in realizing this objective (Adger et al., 2005; Parker & Karlsson, 2018). By priortizing such measures, developing countries can enhance the resilience of their communities and shield them from the ramifications of a changing climate. Furthermore, these measures engender various benefits, encompassing economic stability, improved public health, and sustainable development, in addition to addressing environmental concerns.

By assuming a leadership role in global climate endeavors, developing countries can inspire other nations to take action and contribute to collective solutions. This can pave the way for heightened international collaboration, technology transfers, and financial support. Moreover, an altruistic approach to climate change can bolster diplomatic standing and foster partnerships with other nations, opening avenues for international funding, technical expertise, and capacity-building initiatives indispensable for effective climate change mitigation and adaptation.

Through prioritizing climate change and embracing an altruistic approach, developing countries can harness their efforts to forge a safer and more sustainable future for their citizens. A comprehensive approach to addressing climate change equips these nations to confront multifarious challenges, unlock economic opportunities, and play a pivotal role in global endeavors aimed at building a resilient world that benefits all. It is vital to recognize that effective mitigation of climate change and assurance of well-being and safety for all nations and their citizens must be grounded by collective and concerted efforts. By fostering collaboration, nations can mitigate the impacts of climate

change, foster sustainable development, and safeguard vulnerable communities from the consequences of a shifting climate. Developed countries, in particular, bear a responsibility to set an example by reducing emissions, providing support to vulnerable nations as they strive to adapt and build resilience in the face of climate challenges.

Rather than exclusively relying on external assistance, developing countries should accord priority to their own efforts in addressing loss and damage. By implementing effective strategies, bolstering governance structures, and fostering partnerships, these countries can fortify their resilience and minimize the adverse impacts of climate change. While external support holds value, developing countries must take ownership and work towards improving their approaches to safeguard their citizens and forge a sustainable future. Nepal, for instance, can effectively demonstrate change through grassroots diplomacy and capacity-building endeavors.

During the 26th United Nations Climate Change Conference (COP26) in 2021, the executive of the United Nations Framework Convention on Climate Change (UNFCCC) stated that "There is no vaccine for the global climate emergency." This statement underscores the urgent imperative for global engagement, dialogues, and actions that involve both humanity and nature. Demonstrators at the event emphasized that addressing climate change necessitates "system change, not climate change," thus highlighting the need for concrete action rather than mere verbal commitments. The origins of this statement underscore the call for economic democracy to confront bureaucratic, cultural, and economic sectoral dominance.

Climate Change challenges transcend temporal, spatial, cultural and intellectual scales and blurs historical, geographical, local, national, cultural, international and disciplinary-spiritual boundaries and assumptions. This is especially true for Nepal as the center of the Hindu Kush Himalayan (HKH) region and the most elevated—in both conventional and climate change vulnerability senses—of Earth's

countries. It also challenges contradictory goals grounded in Nepal's astounding socio-ecological diversities and its related many and radically varied people's aspirations for rapid "development" with cultural autonomy. Addressing such inherently global phenomena with associated local variation and diverse vulnerabilities while minimizing socio-ecological disturbance requires identifying drivers of vulnerabilities at different scales and interventions.

The global aspirations for sustainable development are encapsulated in key international agreements such as the Sustainable Development Goals (SDGs), the Paris Agreement of 2015, and the Sendai Framework for Disaster Risk Reduction (DRR). These agreements serve as essential frameworks to guide decision-making processes and actions aimed at addressing various obstacles and challenges. Nepal, as a signatory to these global agreements, has committed to pursuing development paths that prioritize "low greenhouse gas emissions and climate-resilient development." This commitment is aligned with national strategies, such as the Nationally Determined Contributions (NDCs), which outline specific targets and actions to mitigate climate change.

Given the absence of comprehensive international instruments that provide meaningful guidance or enforceability, the most viable approach is to utilize non-market instruments to implement national policies addressing environmental concerns. Non-market instruments refer to regulatory measures, policy frameworks, and other tools that do not rely solely on market mechanisms or economic incentives. These instruments play a crucial role in shaping and facilitating the implementation of national strategies for sustainable development, climate change mitigation, and environmental protection. By leveraging non-market instruments, Nepal and other nations can work towards fulfilling their commitments and advancing their environmental agendas in the absence of robust international mechanisms. The Article 6 of the Paris Agreement, expresses the market and non-market mechanism in climate action cooperation. These policy instruments must address both

political and institutional barriers with inherently qualitative aspects (Stavins, 1997). Acces to Justice in Nepal is elaborated by sensing how polcies are being made and implmeneted

In the context of climate change, relying on the conventional approach of "business as usual" is deemed ineffective and inadequate. This approach is akin to entrusting the protection of the chicken coop to the very predator, as it perpetuates unsustainable economic practices that contribute to environmental degradation. Similarly, the alternative perspective of "following the science" is also limited in providing actionable and context-specific guidance beyond advocating for low-carbon and green solutions.

While scientific insights are valuable in understanding the causes and consequences of climate change, addressing this complex issue requires more than a broad adherence to scientific principles. Climate change is a multifaceted challenge that encompasses social, economic, political, and cultural dimensions. Merely relying on generic calls for low-carbon and green solutions overlooks the diversity of contexts and the need for tailored approaches that consider local realities, vulnerabilities, and aspirations.

To effectively address climate change, it is crucial to go beyond simplistic nostrums and engage in comprehensive and nuanced strategies. This entails integrating scientific knowledge with socio-economic considerations, cultural values, and policy frameworks that are responsive to specific contexts. By embracing a multidimensional approach, policymakers, scientists, and communities can develop innovative and context-specific solutions that prioritize sustainability, resilience, and the well-being of both people and the planet. It requires a holistic understanding of the interconnections between economic, social, and environmental aspects and the development of strategies that balance multiple objectives and promote transformative change.

Climate Change's (CC) unprecedented nature challenges ALL received assumptions, fields of knowledge and study, institutions, cherished

"wisdoms" and beliefs and thus requires a META—discipline-science and culture-spiritual-political/economic and other quasi-religious ideology and thus human behavior driving—approach to contextualize, learn, coordinate, and implement activities and decisions made at personal, family, group, local, national, and transnational levels. Engaging such an unprecedented challenge with meaningful response-requires institutions to think-plan-act beyond traditional assumptions. This means and requires transcending historic bilateral and multilateral planning and decision making-taking models. All responses MUST thus grow, whether consciously or capriciously, while resisting with all the child- and adolescent-like tricks since there are no alternatives, from hierarchically nested and system-informed (or driven) insight grounded in engagement at individual, family, village and global levels of socio-ecological order and, unfortunately, much disorder, which can be reduced by acceptance, rather than strutting avoidance, of history's most painful and universal lesson "Homo Sapiens must, like all species, also find niches within the ecosystem's capacity or vanish"

Effective communication of solidly grounded information is key to a global/national, and necessarily diplomacy-informed, approach. Such an approach requires gap identification at local, national and transnational levels to negotiate with global stakeholders utilizing, different-from-traditional, business-as-usual, practices of negotiations with bilateral and multilateral agencies on a variety of issues. Including, but not limited to governance, ecological systems, urbanization, resilience and spirituality, or spirituality-like beliefs, often cloaked in labels or beliefs, including, so called, modern ones with no more credibility than discarded ones, like "primacy of markets" or "property rights" that seem far from spiritual but share spirituality-similar belief-grounded, as opposed to clearly "objective", support.

Nepal's current development scrambles its social-ecological order and confounds its historic and diverse human, thus cultural, ethos. This report illustrates the role evidence-based policy could play in fostering more

meaningful cross-cultural collaborative deliberation and negotiation to secure benefits for the country while simultaneously meeting international commitments. The pending catastrophe of, already well underway, Himalayan glacial melt, which bodes ill for a large share of humanity's water and food supply, reflects small nation's inability to control their development trajectory while feeding socio-ecological vulnerability, and calls for imaginative and engaged resilience-seeking climate diplomacy.

In the recent past, COVID-19 slowed "conventional" ecosystem disturbing activities around the world resulting in visible skies, mountains and, in Nepal, access to Hindu Kush freshened air. The annual reduction in global energy-related CO2 emissions from 2019-2020 was 2.6B metric tons (Figure 1). This change turned Kathmandu's dust and exhaust overloaded unhealthy plumes back into breathable air. Monsoon rain even made the green hills' trees surrounding the valley appear closer and their previously ghostly existence real. Although Nepal is the least carbon-emitting country in comparison to the top six and EU confederations (Figure 2), its chaotic development impedes quality of both human and all other life.

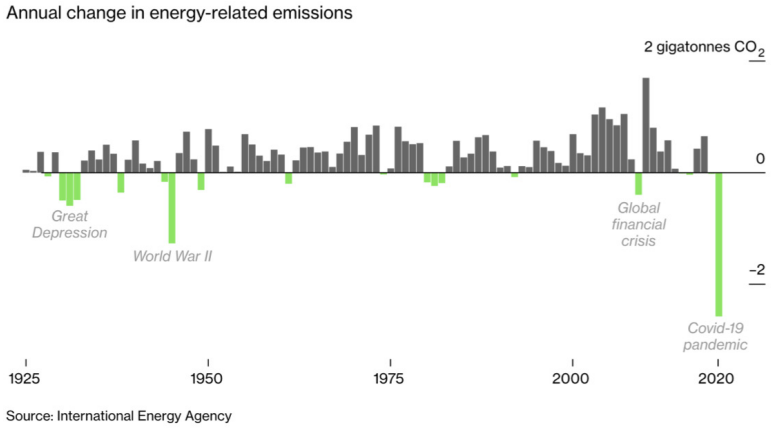

Figure 1. Global energy-related CO_2 emissions from 1900-2020

Source: IEA, 2020

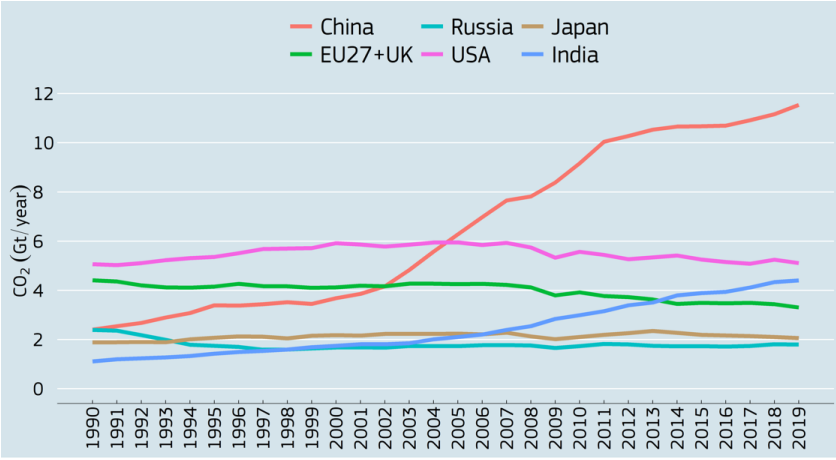

Figure 2. Fossil CO_2 emissions emitting economies

Source: Crippa, et al., 2020.

The nexus of CC and development pathways is well-rooted in the economic system owing to its preface, "industrialization" and subsequent corporatization and marketization. Recent world economic activities are viciously fueled by "free-market fundamentalism" and its accelerating attack on the foundational livelihood, culture, and ecosystem complex (Rimal, 2018). As ever, "man's economy, as a rule, is submerged in his social relationships" (Polanyi & MacIver, 1944).

Nepal's endemic poverty and geopolitical situation, especially its iconic elevated,. and slope and fresh-air challenged, location between two huge influential and heavily industrial and populous countries, illustrates the need for creatively active global foreign policy to influence planetary responses to global ecosystem stress which ultimately accumulates as climate change. While climate change has been tokenly engaged by many countries in their foreign affairs "conversations" in bilateral and regional engagements addressing development and security, only major challenges to "business as usual", as is so starkly illustrated by Figure 1's global CO2 data, have significantly, though only temporarily, altered the dominant pattern. A pattern which cannot long continue on a finite

planet, and which treats exceptionally elevated locations like "mine canaries" but also, like the other canaries gives them, and through them the world, advanced opportunity to explore, test and model early response, despite early response's historic role as last chosen among possible responses.

The present report addresses "what's going on?" regarding climate and its cross-cutting themes. The study reports aspects of social, economic and environmental and political issues in the context of sustainable development. The information used is grounded on thematic analysis—drawn from cooperating key scientists currently studying Climate Change at the officially most scientifically credible levels—and employs qualitative methodology, informed by "the" literature, to access and summarize these scientist's insights(Ward et al., 2009).

1.2 Development narrative

Nepal's current development "pathway", as with all previous "development" everywhere, confounds social-ecological order and challenges historical systemically informed global and local cultural ethos. The present report illustrates the role evidence-based policy could play in negotiations to secure benefits for the country while simultaneously modeling meeting international commitments. Emergence from the intersection of Hindu Kush Himalaya (HKH) glacial melt, small nation (geopolitical consternation driven) development trajectory, and socio-ecological resilience call urgently for creative, engaged, and imaginative climate diplomacy. Its need to restablish "sovereign sense" (Clark, 1988).

Nepal's current development pathway, like many other development processes worldwide, often disrupts the social-ecological order and poses challenges to historical and culturally informed global and local values. This report emphasizes the importance of evidence-based policy in negotiating favorable outcomes for the country while also adhering to international commitments. The convergence of factors such as the

melting glaciers in the Hindu Kush Himalaya (HKH) region, Nepal's geopolitical circumstances, and desperate need for socio-ecological resilience necessitates urgent and innovative climate diplomacy. It is crucial to restore a "sovereign sense" that prioritizes Nepal's interests and values within the broader context of sustainable development and global cooperation.

To address these complex challenges, evidence-based policy-making can play a significant role. By grounding decisions in reliable data, research, and analysis, policymakers can develop strategies that balance the country's development aspirations with environmental and social concerns. This approach could enhance likelihood that decisions might be well-informed, transparent, and accountable, leading to more effective, equitable and globally-efficient outcomes.

Negotiating international commitments requires a delicate balance between securing benefits for the country and fulfilling obligations towards global cooperation. Creative, engaged, and imaginative climate diplomacy is essential in this regard. It involves actively participating in international forums, collaborating with other nations, and advocating for Nepal's unique vulnerabilities and development needs. By forging alliances and promoting dialogue, Nepal can influence the global discourse on climate change and sustainable development, ultimately benefiting its own, and the planet's, socio-ecological resilience.

Establishing a "sovereign sense" implies reasserting Nepal's autonomy and agency in shaping its development trajectory. It involves prioritizing the country's cultural, historical, and environmental heritage while pursuing sustainable economic growth. By integrating local knowledge and values into development plans and policies, Nepal can create a pathway that respects and enhances social-ecological systems. This approach not only benefits the people and environment of Nepal but also contributes to a more equitable and resilient global order.

In summary, Nepal's development pathway requires evidence-based policy-making, creative climate diplomacy, and a reestablishment of a

"sovereign sense" to navigate the challenges posed by the Hindu Kush Himalaya glacial melt, geopolitical dynamics, and socio-ecological resilience. By adopting a holistic and inclusive approach, Nepal can strive for sustainable development that respects its cultural ethos, safeguards its natural resources, and contributes to the well-being of its people while fulfilling its international commitments and taking them beyond their original intent toward leading humanity toward a viable future.

The sense of sovereignty refers to a nation's perception and exercise of its independent authority over its internal affairs and external relations without undue interference or influence from external forces. It encompasses a nation's ability to make decisions, enact policies, and assert its autonomy in accordance with its own interests, values, and priorities.

For Nepal, maintaining a sense of sovereignty is crucial in navigating its development pathway and engaging in global affairs. It involves safeguarding the country's political, economic, and cultural independence while actively participating in international forums and negotiations. In the context of development, a sense of sovereignty entails the ability to determine and implement policies that align with Nepal's unique circumstances and aspirations. This includes making decisions regarding resource management, economic development strategies, and social policies that reflect the country's cultural, historical, and environmental heritage. By exercising sovereignty, Nepal can prioritize the well-being of its people, protect its natural resources, and address the socio-economic challenges history has brought.

At the same time, sovereignty does not imply isolation or complete detachment from the global community. Nations often engage in diplomatic relations, trade agreements, and collaborative efforts to address shared challenges. Upholding sovereignty in the context of development requires skillful diplomacy, negotiation, and cooperation with other nations. By engaging in climate diplomacy, participating in

international agreements, and contributing to global efforts, Nepal can ensure its interests are represented while also fulfilling its responsibilities as a member of the international community.

In summary, a sense of sovereignty for Nepal entails maintaining independence and autonomy in decision-making while actively participating in global affairs. It involves aligning development policies with national interests and values, protecting cultural and environmental heritage, and engaging in international cooperation to address common, often ignored challenges. By upholding sovereignty, Nepal can shape its development pathway in a manner that reflects its unique identity and aspirations while contributing to a more sustainable and equitable global order.

Meaningful engagements that realize a country's capacity involve actively involving its people in decision-making processes and policies. It means recognizing and valuing the knowledge, perspectives, and aspirations of the population and ensuring their meaningful participation in shaping the country's development trajectory. Prioritizing sustainable and inclusive development is crucial to safeguarding both the people and the resources they rely on.This involves considering the social, economic, and environmental well-being of the population and ensuring that natural resources are managed responsibly and equitably. It means promoting practices that protect the rights and livelihoods of individuals and communities, particularly those who are vulnerable or marginalized.

Upholding the norms of deliberative democracy implies fostering a democratic and participatory system of governance. It means promoting open dialogue, inclusivity, and transparency in decision-making processes. Deliberative democracy encourages diverse perspectives, informed discussions, and consensus-building, allowing for more informed and equitable policy outcomes.

By considering the beneficiary as both the people and the planet, a country can adopt a sustainable development approach that balances

social, economic, and environmental considerations. This involves recognizing the interdependence between human well-being and the health of the natural environment. Policies and actions should aim to improve the quality of life for current and future generations while ensuring the preservation and responsible use of natural resources.

To achieve these goals, it is crucial to integrate the principles of sustainable development into policy-making, including considerations of social equity, economic viability, and environmental sustainability. Engaging with stakeholders, including civil society organizations, indigenous communities, and local residents, can provide valuable perspectives and ensure that decisions align with the needs and aspirations of both the people and the planet.

Meaningful engagements that realize a country's capacity involve actively involving the population in decision-making processes. Upholding the norms of deliberative democracy ensures inclusive and transparent governance. By holding fast to the people and the resources they depend on and considering the beneficiary as both the people and the planet, a country can strive for sustainable development that improves the well-being of its population while safeguarding the environment.

Following Millennium Development Goals (MDGs) results, Nepal is implementing activities to achieve its own Sustainable Development Goal (SDG) targets for 2030. This effort is expected to address gaps between MDGs focused on equitable development and goals set by the country's SDGs. The primary purpose of the SDGs is to ensure that the country's regional economy is mobilized on clean sources of energy while simultaneously addressing other climate change issues.

Alarming effects of climate change in Nepal include disasters from glacial melt and monsoon-driven floods as well as unprecedented dry spells and drying of natural and historically perennial spring water. While these realities are affected by human actions within the country, global greenhouse gas (GHGs) and Short-Lived Climate Pollutants

(SLCPs) such as black carbon, and other industrial pollutants emitted in the region's industrial locations are important contributors to both local environmental degradation and climate change scenarios. Legacy impacts of previous chaotic urban development in transportation, housing, businesses etc, although now restricted across the nation, still contribute to greenhouse gas emissions, localized pollution and chaos. However, continued policies and actions to improve the well-being of both people and the environment can reduce carbon dioxide and other greenhouse gas emissions that are primary drivers of climate change.

To develop resilience from the consequences of natural disasters, a robust model of human development should be creatively implemented that will enhance both public awareness and proper infrastructure development based on improved management plans, appointment of efficient response teams, and provision of adequate relief supplies. Additionally, standards of transport, communication and energy, residential infrastructure and consumables in the country should internalize externalities regarding carbon and both crises driven vulnerabilities and long-term sustainability. This may require embedding green concepts in the value chain of goods and services at institutional, community, and individual levels. Such activities can contribute to achieving Nepal's 2030 SDGs by improving livability in cities, villages and rural areas with enhanced access to clean air, water, waste management, and green space.

1.2.1 Sustainable development

Governments and global institutions adopted the triple bottom line (TBL) framework for sustainability after the United Nations (UN) and International Council for Local Environmental Initiatives (ICLEI) adopted full cost accounting. Similarly, multilaterals such as the World Bank operationalized TBL by encouraging inclusive green growth as a pathway to sustainable development. Although Nepal is sustained both directly by natural resources and through their contributions to

some industries including tourism, forestry and agriculture, inclusive green growth requires becoming efficient and resilient in the use of natural resources to minimize pollution, environmental impacts and reduce disaster risks. Such outcomes can contribute to reducing poverty, the number one Sustainable Development Goal. Integrating Ecosystem Services and development planning and action in infrastructure development, food, and energy production, access to clean water and air, and aesthetics supports a low carbon future (Lindley et al., 2018; Picchi et al., 2019). Nepal is undergoing rapid economic transformation and starkly vivid challenges in environmental quality (water, air, soil, and waste) requiring efficient and ecologically sensitive agriculture, infrastructure, energy, and tourism. Green growth can address negative environmental externalities, generate profit and increase opportunities for people in poverty while addressing SDGs as is illustrated in (Table 1).

Table 1. Sustainable Development Goals of the UN

1. No Poverty
2. Zero Hunger
3. Good Health and Well-being
4. Quality Education
5. Gender Equality
6. Clean Water and Sanitation
7. Affordable and Clean Energy
8. Decent Work and Economic Growth
9. Industry, Innovation and Infrastructure
10. Reduced Inequality
11. Sustainable Cities and Communities
12. Responsible Consumption and Production
13. Climate Action
14. Life Below Water
15. Life On Land
16. Peace, Justice, and Strong Institutions
17. Partnerships for the Goals

Source: United Nations

1.3 Study approach

This study combines the drivers, pressures, state, impact and response (DPSIR) model, Grounded Theory (GT) and Systems Thinking (ST) into a more humble, hence realistic, offering to the ever-growing yet always-struggling effort to move exploration of complex and difficult-to-measure social contexts toward meeting physical science standards. Such "standards", manifested historically and most emblematically by Newton's mechanics, Carnot's thermodynamics, and Einstein's many contributions involving, among others, those regarding mass/energy-light-gravity-relativity-proto quantum mechanics. The search for standards was furthered and polished by both mathematics' precise articulation of relationships and laboratory sciences' success with "controlled" experimentation. When applied outside of realms with invariant units of measure that support physical and laboratory science's ultimate standard, replicability, such efforts are sometimes disparaged as reflecting Physics Envy. The suggested approach offers an evolving qualitative heuristic (individual- and community- comprehension and communication supporting) approach to seeking meaningful, useful and shareable insights for furthering understanding of complex, difficult-to-measure, and thus "control"-defying, socially rooted—hence grounded— problems. Heuristics are often "rules of thumb" that encourage efficient decisions via shortcuts (Gigerenzer, 1991). Nobel Laureate, Herber Simon used the term heuristic to describe rational choice for effective decision making (Kheirandish & Mousavi, 2018). In my grounded theory (GT) follows a combination of classical GT (Glaser & Strauss, 2017) and constructivist approaches (Charmaz, 2017). The overall intent of GT is to fit theory to data—definition of which is much expanded, especially beyond invariant measurement—to allow situationally-relevant, hence both "grounded" and heuristic, substantive theory to emerge.

Some level of literature review is always inevitable, especially for finding research problems and settings and for framing preliminary

understanding, for any research, but GT abstains from devotion to prior literature in search of a-priori "hypotheses" following classical "science" which can bias both observation and interpretation of observation's results. The constructivist approach is, therefore, embedded into the observation and theory building process, "We build the road as we travel" mode similar to leaving pitons, ropes and ladders to help followers ascend difficult mountainous terrain (Morrison, 1997).Only when the research process proceeds to the point that the grounded information begins to suggest emerging substantive theory grounded in the research context is substantive context- and theory-focused literature consulted to address validity primarily as a limited form of retrospective "replication" (Rimal, 2021). Key categories are distilled by application of GT's core tools and process: issue-focused open-ended, unstructured conversational interviews, observation, and informal conversation with the whole process informed and guided by key information from specialists in areas related to the general topic under exploration. For this Global Environmental Change (GEC) focused work, such key informants included: academic specialists, and non-specialists on the areas of GEC's interrelated concerns who were chosen for interaction via direct one-to-one in-person and phone conversations (Marshall, 1996; Tremblay, 1957). The narratives of key information specialists were based on a selection of the most influential scientists active in the current climate change debate listed in the "Reuters Hot List" (Tamman, 2021). Current developments in GT support using literature as data (Martin, 2019).

GT and ST have "unique" synergistic properties that support holistic examination of the situation in context (Martin, 2019). This study uses System Dynamics' Causal Loop Diagram (Meadows, 2008) based on categories distilled from GT exploration to illustrate complex interrelationships inherent in issues of climate change, development, and diplomacy. The combination of GT and ST following System Dynamics is used to enhance understanding in multidisciplinary studies (de Gooyert, 2019; Rimal, 2018, 2021). Schematic presentation of data

as Causal Loop Maps illustrates and supports quickly visualizing not only complexity but also leverage points for intervention (Sterman, 2000). Studies of climate change require special focus on a multiplicity of SDG-related issues to generalize specific-study-based insights (Fujimori et al., 2020). This dimension made the present study truly transdisciplinary. Some of the focused activities in the research process are the following:

- Reviewed thematic gray literature such as reports and documents for agreement with data published by governmental and non-governmental agencies engaged with GEC-related issues.
- Reviewed GoN and its development partners and other stakeholders' priorities and plans concerning SDGs and adaptation to the risks of climate change and disaster.
- Reviewed Nepal's safeguard systems, and commitments to meeting the Sustainable Development Goals (SDGs) and Nationally Determined Contributions (NDC).
- Reviewed national, provincial and municipal institutional arrangements for environmental governance.
- Reviewed "Reuters Hot List" of active climate scientists.

1.3.1 Interviews

In the research project, hour-long interviews were conducted with key informants who represented various public and private organizations. These organizations included civil society groups, community organizations, non-governmental organizations (NGOs), academic institutions, and individual experts. The purpose of these interviews was to gather valuable insights and perspectives on the topic under investigation.

1.3.2 Analysis and interpretation

"Data" from various sources were inductively synthesized into thematic patterns. The research process was both "reflexive and iterative"

(Fereday & Muir-Cochrane, 2006). In this study, the identified themes were carefully examined and articulated to form a coherent narrative. The relationships between these themes were analyzed and visualized using a Causal Loop Map (CLM). The CLM served as a graphical representation of the causal connections

and feedback loops among the themes, providing a comprehensive illustration of how they interacted with each other. By presenting the CLM in the substantive chapter, the study aimed to enhance the understanding of the complex relationships and dynamics within the identified themes, ultimately contributing to a more comprehensive analysis and interpretation of the research findings.

Chapter 2
Environmental Change

2.1 Global environmental context

This report highlights the significance of incorporating contextually informed sustainability goals to effectively respond to the formidable challenges posed by Global Environmental Change (GEC) and Climate Change (CC). Current market-dominated cultural aspirations may be insufficient in addressing the intricate relationship between human activities and the environment. To address this, adopting eco-systemic perspectives becomes crucial in formulating sustainable development trajectories that account for the comprehensive well-being of socio-ecological systems across different scales. Given the urgency of tackling GEC and CC, a paradigm shift towards eco-systemically informed sustainability goals is essential. By embracing contextually relevant approaches and recognizing the complex interactions within socio-ecological systems, we can aspire to create a future that is more sustainable and resilient for all life on Earth. The need for action is immediate. However, perceptions at a local scale in both regional sub societies as well as in smaller diplomatically stand-alone societies like Nepal bring special challenges (Busby, 2018). How, for example, are such unattached polities to comprehend and respond to the impacts of GEC/CC? And how might such entities deal with GEC/CC issues at the ground level? Finally, how can such entities share their unique situations and preliminary responses credibly and diplomatically with the larger world? Continuing wide-spread pursuit of previously "conventional"

20th and early 21st Century industry/market-informed assumptions about what "development" is, with little concern for GEC/CC - respecting "authentic development", raises many concerns (Pyhälä et al., 2016). Institutions responsible for addressing CC from the perspective of the most vulnerable often use finance and market "tools'', which can bear painful similarity to magic's "smoke and mirrors'' deception, to "address" the problem rather than seeking and incentivizing socio-ecological resilience and adaptation (Barnett, 2020).

Sustainable Development Goals (SDGs) reflect and seek to honor and support mutually interactive systems of ecology, economy, and society (Barbier & Burgess, 2017). The seventeen United Nations defined SDG goals are interdependent and thus require systematic collective review and pursuit rather than focusing on one or a few of them (sdgs.un.org/goals). Addressing relevant leverage points' greatly enhances prospects for making progress regarding the whole goals package in the shrinking remaining time frame. Given climate change's trajectory, identifying contextual leverages is critical to a successful response to this human-impact-created problem now increasingly called the Anthropocene (Lim et al., 2018). The Anthropocene is a proposed geological epoch that recognizes the significant impact of human activities on Earth's ecosystems. Although it is not yet officially recognized by the International Union of Geological Sciences (IUGS), the concept has gained widespread attention and discussion among scientists (National Geographic, n.d.; Pavid, 2021).

The term "Anthropocene" represents a proposition for the designation of a novel geological epoch that acknowledges the profound influence of human activities on the Earth's systems. While it awaits official endorsement from the International Union of Geological Sciences (IUGS), it has engendered substantial interest and discourse among the scientific community. The conception of the Anthropocene amalgamates the Greek root "anthropo," signifying human, with the suffix "-cene," denoting a geochronological unit. It recognizes that humanity

has emerged as the primary catalyst behind global environmental transformations, surpassing the agency of natural forces to become the predominant determinant of Earth's systems.

The Anthropocene is typified by a multitude of discernible modifications ascribed to human interventions, encompassing alterations to atmospheric conditions, land utilization patterns, biodiversity dynamics, ecological compositions, and global climatic patterns. These alterations are discernible through the analysis of durable geological indicators and other corroborative evidence. Some of the noteworthy transformations associated with the Anthropocene encompass deforestation, habitat degradation, species extinctions, pollution, the emission of greenhouse gases, and the ensuing ramifications of global climate change.

While scientific deliberation persists regarding the precise commencement date of the Anthropocene and its formal recognition as a geological epoch, the concept has furnished a framework for comprehending and addressing the profound repercussions of human undertakings on Earth's systems. It accentuates the exigency of embracing sustainable practices, undertaking conservation endeavors, and implementing strategies for climate change mitigation to foster an equilibrium and resilient planetary milieu.

It is important to acknowledge that the discourse surrounding the Anthropocene remains an evolving endeavor, with the scientific community continually examining its substantiation and ramifications. The IUGS is currently engaged in a comprehensive evaluation of the substantiating evidence and deliberations to determine the feasibility of formally establishing the Anthropocene as a novel geological epoch.

Leverage point(s) is a both "heuristic and practical" perspective for addressing SDGs sustainably by enhancing the effectiveness of intervention in complex systems (Fischer & Riechers, 2019). Localization of application of the SDGs approach of the UN and other multilateral and bilateral development agencies can enhance the impact of interventions towards "resilience" and "adaptation". It can further

help the Organization for Economic Co-operation and Development (OECD) members and developing countries work together toward sustainable growth and carbon-neutral development objectives.

Table 2. Key indicators of SAARC and HKH countries

HKH Countries	SAARC Countries	Population 2021 Million	GDP per capita 2021	GDP growth rate 2020	Military spending 2022 USD	UN Human Development Index (2020)	CO2 Emission (Mton) 2021
Afghanistan	✓	38.93	517	-2.4%	12.0Bn	0.511 (169)	11
Bangladesh	✓	164.7	1961	3.5%	3.8Bn	0.632 (133)	110.16
Bhutan	✓	0.78	3000	-10.1%	25.12Mn	0.654 (129)	2.12
China	✖	1,411	10435	2.3%	237.0Bn	0.761 (85)	11,535.20
India	✓	1,380	2,191	-7.3%	61.0Bn	0.645 (131)	2,597.36
✖	Maldives	0.55	15,563	-33.5%	86.4Mn	0.740 (95)	0.91
Myanmar	✖	54.41	1467	3.2%	2.6Bn	0.583 (147)	48.31
Nepal	✓	29.14	1155	-2.1%	213Mn	0.602 (142)	15.02
Pakistan	✓	220.1	1189	0.9%	11.5Bn	0.557 (154)	223.63
✖	Sri Lanka	21.92	3,681	-3.6%	2.5Bn	0.782 (72)	27.57

Source: UNDP, 2021; WB, 2022; WPR, 2022

The SDGs offer an open platform for multilateral diplomacy that aspires to rebalance power and the economy (Kamau et al., 2018). Famous sociologist Norbert Elias, in his 1939 book "The Civilizing Process'', highlighted the need for understanding power relationships between global and local forces in shaping society and warned of the danger of "pseudo-specialization" affecting long-term human development (Linklater, 2012). This underscores the reality that impact, and influence of "powerful" countries coupled with a multi-faceted and transdisciplinary approach to working with small and financially poor entities are vital for addressing climate change. And because the complexity involved in addressing global problems including CC and SDG implementation requires moving beyond classic, top-down, approaches to diplomacy because of different scales and situations in which actors, issues, and practices converge (Blaxekjær, 2016). Climate

Change inherently affects individual, community, social, economic, and geopolitical agendas (Drexhage et al., 2007). Hence, dialogue and collaboration between and among nations is essential for addressing SDGs at the regional level which includes, especially, countries of the South Asian Association for Regional Cooperation (SAARC) and Hindu Kush Himalaya (HKH) (Table 2).

The ecosystem trajectory of CC in the context of the key indicators (Table 2) of both SAARC and HKH (Figure 3) regions reflect troublesome concerns at the heart of the region's more than 3.5 billion—nearly half (46 percent), including the island countries of Maldives and Sri Lanka of SAARC, of the overall world population—a group of massively ecosystem services-dependent peoples and cultures. The HKH region with headwaters for 10 major river basins (the Amu Darya, Indus, Ganges, Brahmaputra, Irrawaddy, Salween, Mekong, Yangtse, Huanghe, and Tarim) supports 1.9 billion people or approximately one-quarter of humanity (ICIMOD, 2022). The HKH is the source of immense volumes of water stored in snowpack and glaciers which have long provided perennial ecosystem services for mountain and downstream communities, now melting at unprecedented rates and causing many downstream problems and worse. Given this fact, Nepal which has 8 of the 10 largest peaks of the region located within its boundaries is especially significant and thus potentially diplomatically important (Table 2, Figure 4).

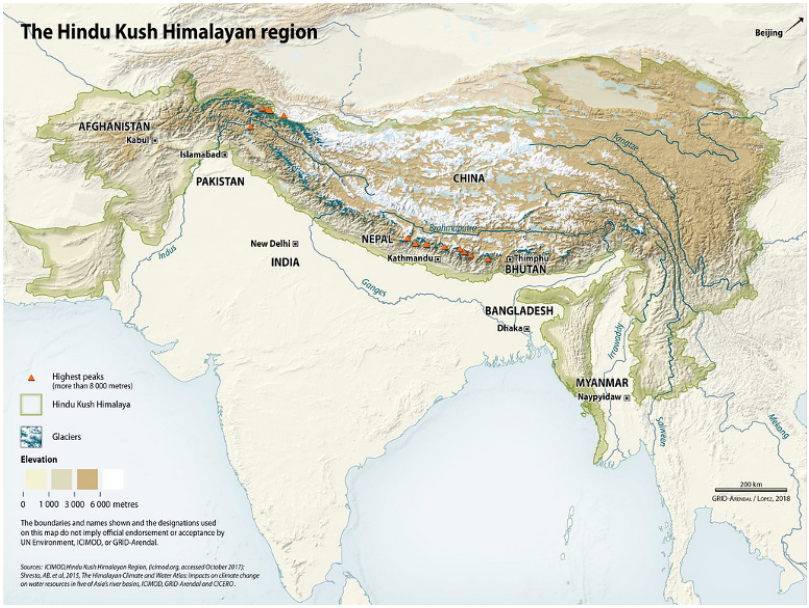

Figure 3. HKH region,
Source: GRID-Aredal (www.grida.no)

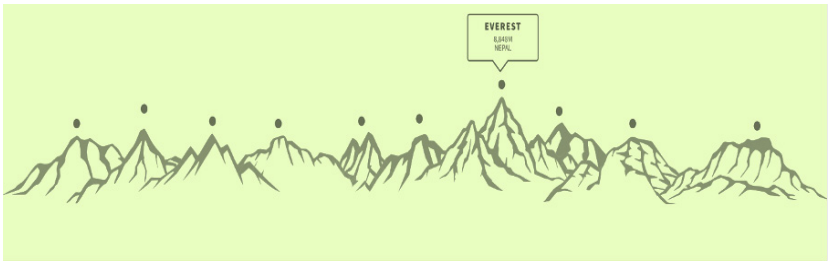

Figure 4. Major peaks in the HKH
Source: ICIMOD, 2022

Because of the steep and rugged geography, the region also includes more than 50 percent of the world's biodiversity hotspots (Xu et al., 2019). The UN's Agenda 21 also emphasized the importance of mountain environments as "essential to the survival of the global ecosystem" (UNSD, 1992). Thus, addressing CC's impact in the SAARC and HKH region which is vitally important to the world's

future and could serve as a significant leverage point in regional and global diplomacy. Given the smallness of its geography and its vast ecological significance due to both altitudinal extremes and variation, Nepal should play a pivotal role in solution-seeking regarding both GEC and CC as well as modeling eco systemically diverse responses toward meeting the SDGs. Because meaningful progress toward any goal typically starts small and grows with increasing understanding and knowledge, transformative narratives from the bottom-up are crucial for climate action in search of exits from top-down doom and gloom narratives (Hinkel et al., 2020).

Approaches grounded by national climate strategies and associated local actions are critical for achieving nationally-pledged actions under the Paris Agreement (Hultman et al., 2020). This is important for supporting regional dialogue and collaboration at the speed and scale required to both reduce poverty, which is the No.1 SDG goal, and to avert increasing eco systemic disasters. Such diplomacy/collaboration based on action at fundamental levels can be extremely useful for general achievements supporting interventions such as Green Growth Initiatives (GGI).

Increased use of transdisciplinary knowledge in scientific-technological, economic-social and ecological realms can assist in addressing SDGs and related sociological goals and actions to address climate change at local, regional and global levels. Nepal's Ministry of Federal Affairs and General Administration approved "Environment Assessment Guidelines" for local governments (MoFAGA, 2020). This document supports the implementation of activities related to the Environment Protection Regulation 2020, and the Environment and Natural Resources Conservation Act Framework (ENRCA) at the local level. Although such efforts are signs toward progress, meaningful action will require contextualized SDG-related intervention and commitment to action to address climate change. There are a myriad of legal environmental documents (e.g., Acts, rules, regulations, guidelines, action plans and

policies) in Nepal. Some of the key legal documents addressing climate change action are tabulated below based on their thematic and cross cutting areas (Table 3).

Table 3. Climate Change Focus Areas in Nepal

Thematic areas	Cross cutting areas
• Agriculture and Food Security • Forests, Biodiversity and Watershed Conservation • Water Resources and Energy • Rural and Urban Settlements • Industry, Transport, and Physical Infrastructure • Tourism, Natural and Cultural Heritage • Health, Drinking Water and Sanitation • Disaster Risk Reduction and Management	• Gender Equality and Social Inclusion (GESI) • Livelihoods and Governance • Awareness Raising and Capacity Building • Research, Technology Development and Extension • Climate Finance Management.

Source: MoHP, 2020

Nepal's ambitious plans for addressing CC exists primarily in documents rather than in action-driven implementation is confirmed by contrasts between aspirational "official" documents and results (Bhusal, 2021). The actions and results contradict Nepal's submission to the Nationally Determined Contribution (NDC) of the United Nations, a pledge to cut greenhouse gas emissions and adapt to the changing climate that every cosigning country is required to submit under the Paris Agreement. Growing environmental degradation on various environmental fronts requires action on climate change (ADB, 2020). The IPCC intends to offer updated scientific climate change assessments, implications, and likely future risks including adaptation and mitigation options to policymakers. Internalization of such information and inputs enhances local actions and supports regional and international negotiations to protect people in poverty from escalating ecological degradation since smaller and especially more densely populated nations are

disproportionately affected by industrial and population pressures (Taconet et al., 2020).

Table 4. Key Legal Documents on Climate Change in Nepal

Climate Change legal documents	Date
1. Environment Assessment Guidelines to local governments	2020
2. Second Nationally Determined Contribution	2020
3. Environment Protection Rule	2019
4. Sagarmatha Sambaad	2019
6. National Environment Policy	2019
7. National Climate Change Policy	2019
8. Climate Change National Adaptation Plan	2019
9. Environment Protection Act	2019
10. Disaster Risk Reduction National Strategic Plan of Action	2019
11. Disaster Risk Reduction and Management Regulation	2019
12. Fifteenth Plan	2018
13. National Policy for Disaster risk Reduction	2018
14. National REDD+ Strategy	2017
15. Local Government Operation Act	2015
16. Water Induced Disaster Management Policy	2015
17. Forest Policy	2014
18. Second National Communication to UNFCCC	2012
19. Nepal Climate Change Support Program	2011
20. Climate Resilient Planning	2011
21. Local Adaptation Program of Action	2011
22. National Adaptation Program of Action	2010
23. Everest Declaration 2009	2009
24. Ozone Depleting Substances Consumption (Control) Rules	2001

Source: Author's own

2.2 State of environment

The actualization of Nepal's Multilateral Environmental Agreements (MEAs), requires that it internalizes and acknowledges its "technocratic"

CC commitments with thorough analysis and contextualization toward achieving SDGs (UNEP, 2016). While the under-functioning of its new federal structure poses challenges, the extensive nature of historic and continuing ecological damages requires addressing pervasive mal governance. This problem is documented by Nepal's ranking of 117 among 180 global nations in the Corruption Perceptions Index in 2021 (TI, 2021). Mal-governance has and continues to seriously impede eco systemically meaningful intervention. Awareness and coordination among multiple actors and players on environmental issues, compliance, protection, adaptation, and mitigation of CC impacts are critical for meaningful environmental governance and conservation practice (Armitage et al., 2012). Balancing "needs and wants" is critical for enhancing institutional capacity to support dynamic policy processes and practices in the context of evolving global understanding and practices. Some existing perspectives and practices are valuable, and others are not, discrimination regarding what is useful and contextual and what is not requires insightful and reflexive leadership. The choice among global opportunities and risk requires avoiding both "kid in a candy store" and "magical thinking" syndromes. Enjoying yourself or expecting/hoping for far too much and not acknowledging constraints and controlling desires and behavior accordingly generates collectively harmful aspirations and actions both of which Nepal, too much of its both historic and current "leadership", and many of her subcultures, have long suffered and must now begin to back away from.

Nepal's inclusion of "green development" aspirations in paper documents meant to combat CC without acknowledging problems caused by contexts, conflicting inter-agency relationships, shortage of adequate means and resources, and mal-governance for addressing issues relating to climate change have also led to slow goal achievement. The Nepal Multiple Indicator Cluster Survey indicates improvements in terms of infant mortality rate, malnutrition, gender equality, and women's empowerment (UNICEF, 2019). However, the targets for environmental sustainability and global partnership were not fully

achieved. This report indicates the need for community-based initiatives for effective conservation and adoption of affordable energy-efficient technology.

The concept underlying Nepal's SDGs is primarily to reduce poverty and offer opportunities at social, economic, political, cultural, and ecological levels. These are the triple bottom lines of development paradigms. Most rural settlements in Nepal depend on natural resources. Some locales underutilize natural resources while others exploit them excessively. Rent-encouraging environmental policy is supported by rent-seeking groups at local to national levels which distorts use patterns of natural resources such as land, water, and biodiversity (MacKenzie, 2017). Some of these result from weaker planning, enforcement, and governance despite regulatory capacities encouraged by the national "Integrated Rural Development Plan".

Environment Statistics of Nepal from 2019 help illustrate the complex relationship between population and CC resulting in uneven resource distribution and allocation. After the devastating Gorkha Earthquake in 2015, GoN promulgated population policy focused on 9 areas with 78 strategies that support SDGs. Nepal's population has doubled since 1980 standing today at a total of 30 million (Worldometer, 2022). Human presence, disasters, and the built environment contribute substantially to negative anthropogenic impacts (Mazzoleni et al., 2021). Environmental diseases such as skin, diarrheal, Acute Respiratory Infections (ARI), and Chronic Obstructive Pulmonary Disease (COPD), which are complicated by exposure to toxic wastes and pollution, contribute to increasing rates of heart disease and cancer (NHRC & MEOR, 2019).

Land-use land-cover (LULC) changes are key drivers of ecosystem degradation and also important negative factors for sustainable development. Understanding relationships among these factors is critical for planners, decision-makers, and managers (El-Hamid et al., 2020). Nepal has historically encouraged and practiced different land-use policies i.e.: before 1950, 1950-80, 1980-00, and 2000-now

when it is exploring zoning concepts (Nepal et al., 2020). While LULC intersects with CC, water resources, agriculture, and biodiversity, fragmented institutions and policy dealing with these aspects of the environment are leading to landslides, erosion, contamination by some agrochemicals, polluted food and water, and disasters of different scales and types, including chaotic land parcel development and sporadic rainfall affecting food security. These aspects, directly and indirectly, affect the livelihoods of common people who mostly seek change and "good" growth as, in their common experience, they heuristically understand it.

2.3 Environmental and social safeguards

Nepal faces various environmental challenges due to rapid population growth, poverty, and associated ecological degradation. Detriment to the environment starts from the unsustainable exploitation of natural resources, a result of the absence of, or weak, environmental planning and enforcement and related chaotic infrastructure development. The Government of Nepal has incorporated environmental concerns into the development process for the last two decades by promulgating several environmental laws. Environmental Impact Assessment (EIA) has evolved since the 1980s and gained momentum after the enactment of the Environment Protection Act 1996 and its Rules 1997 which are used as a tool for the consideration of environmental issues in development planning, administration, and management.

However, EIA is typically undertaken by the project proponent late in the project cycle when key decisions about design and locations are set and in doing so avoid major punitive repercussions. Even more troublesome, GoN financed projects are exempt from compliance with the government's own EIA legal requirements (Shah, 2019). Most often the EIA reports are completed via "copy and paste" from previous and other such documents without meaningful investigation supported by scientific veracity and field investigation. Both practices

undermine environmental governance and challenge sustainable development. The business-as-usual Environmental and Social Impact Assessment (ESIA) therefore is challenged by Strategic Environmental Impact Assessment (SEIA) or Cumulative Impact Assessment (CIA) at the least. Another such framework is the System of Integrated Environmental and Economic Accounting (SEEA) which contains the internationally agreed standard concepts, definitions, classifications, accounting rules and tables for producing internationally comparable statistics on the environment and its relationship with the economy. The SEEA is a flexible system in the sense that its implementation can be adapted to countries' specific situations and priorities. Coordination of the implementation of the SEEA and ongoing work on new methodological developments is managed and supervised by the UN Committee of Experts on Environmental-Economic Accounting (UNCEEA). While practices like those described above regarding EIA continue, humanity will be exploited, impoverished of "spiritual and general well-being" and lose resilience because of natural capital loss compounded by CC scenarios (James, 2019). SDGs are both important facets of GoN and UNFCCC. The SDGs' Climate Action (Goal No. 13) is usually perceived as the most urgent in terms of the need for swift implementation on a local and global scale.

ESIA for Hydroelectric Power Projects in Nepal and related documentation produced by using current Nepali legislation and the reviewed guidance documents do not satisfy the requirements of the International Finance Corporation's Environmental and Social Performance Standard. This is, in particular, because neither the EPR 2019 nor the EIA Guidelines 2020 include appropriate requirements for Environmental and Social Impact Assessment (ESIA) and management of Environmental and Social risks and impacts of projects. Neither pieces of legislation satisfy the requirements of IFC PS 1, and therefore, do not satisfy the fundamental requirements for an ESIA and E & S management of projects that aim to be in line with international best practice as stipulated in the IFC PS (2012). This is especially important

when multilateral agencies such as the World Bank and its consortium consider investing in a project.

The cloud of acronyms and the patchy enforcement of regulations contributes to a complex and sometimes opaque governance landscape, particularly in the realm of natural resources management. This complexity can create challenges in accountability and transparency, leading to rent-seeking behavior and governance issues. Acronyms are often used to represent various regulations, policies, and international agreements, which can make the governance landscape difficult to navigate and understand for the general public. This can create a barrier to effective oversight and citizen engagement, allowing for potential abuses of power and rent-seeking behavior by those in positions of authority.

Rent-seeking behavior refers to the pursuit of wealth or advantages through unproductive means, such as exploiting political or social power for personal gain. In the context of natural resources management, it can manifest as corruption, illegal resource extraction, or favoritism towards certain individuals or companies for personal gain. The patchy enforcement of regulations can further exacerbate these issues. When regulations are not consistently enforced or when loopholes exist, it can create opportunities for rent-seeking behavior to thrive. This can perpetuate a cycle of mal-governance and undermine sustainable resource management.

Governance and global rankings regarding corruption often reflect the prevalence of such mal-governance practices. Corruption indexes and rankings assess the extent of corruption in different countries and can shed light on governance shortcomings. They can serve as a call to action for governments to address corruption and improve governance practices.

Addressing these challenges requires a multi-faceted approach. It involves strengthening governance frameworks, enhancing transparency and accountability mechanisms, promoting citizen participation, and

building capacity for effective enforcement of regulations. It also requires promoting a culture of integrity and ethical behavior in both public and private sectors.

Additionally, promoting international cooperation and adherence to anti-corruption frameworks can contribute to curbing mal-governance practices. This includes supporting initiatives such as the United Nations Convention Against Corruption (UNCAC) and encouraging cross-border collaboration in combating corruption and illicit financial flows.

By addressing the root causes of mal-governance and corruption, societies can foster an environment of transparency, accountability, and good governance. This, in turn, can contribute to sustainable resource management, equitable distribution of benefits, and the overall well-being of communities and the environment.

Chapter 3
State of the Environment

3.1 Introduction

The Drivers, Pressures, State, Impact and Response (DPSIR) model serves as a tool to unravel the state of the environmental system. It has been used by the United Nations Environment Program, United States Environmental Protection Agency, OECD, and European Environment Agency (EEA) as a framework for environmental management (Patrício et al., 2016). Key interrelated themes include built environment (e.g., roads, hydroelectric projects, urbanization, industry, natural environment (heritage, biodiversity, land, water, eco-regions, and climate change), population (migrations), energy, waste, and pollution. The DPSIR process (Figure 5) for issue identification was embedded in the Grounded Theory approach of the research to elicit key categories used in building causal loop maps. The "all [are] data" dictum states that documents, interviews, and observations are all sources of data (Glaser, 2007). The DPSIR model supports "icebreaking" in collecting data where it identifies information categories for analysis through use of a selection of literature (both gray and peer-reviewed), news, observation, descriptive statistics and interviews (Zare et al., 2019). Such activities are in line with problem structuring in System Dynamics Causal Loop Mapping (CLM) (Sterman, 2000).

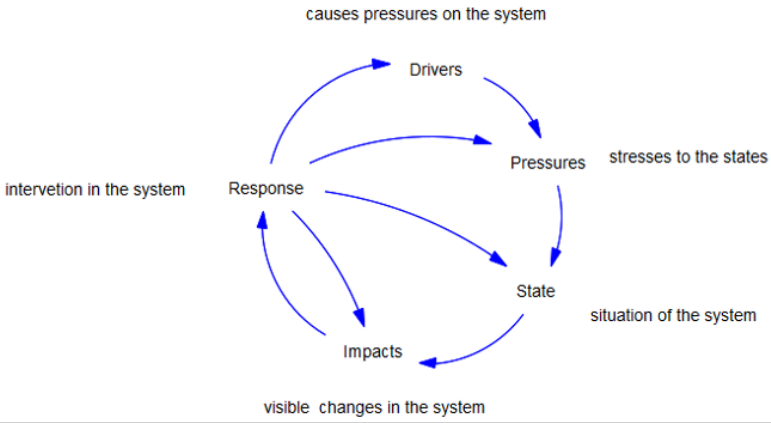

Figure 5. DPSIR model

Source: modified from EEA DPSIR 1999 model (www.eea.europa.eu

The initial process to understand the state of the environment identified key environmental trends in thematic areas (Table 2-2 of Chapter 2) and inter-linkages with climate change and Nepal's development trajectory. It allows us to understand the ecology, economy, and environment in major contexts based on the methodology used in this research.

3.2 Forest and biodiversity

The total forested area of Nepal includes 40 percent forestland and 4 percent other wooded lands. In recent history, Nepal lost almost 25 percent of its forest between 1990 and 2010. Approximately 83 percent of the forest is outside of protected areas (17 percent). The total estimated carbon stock in Nepal's forest is 1,054.97 million tons (176.95 t/ha). A total of 443 tree species belonging to 239 genera and 99 families are identified in Nepal. Nepal's forests in its many ecoregions are affected by illegal logging, grazing, forest fire, and disasters. Despite the level of forest cover, forest clearance for road expansion and construction without appropriate design, construction, maintenance, and mitigation measures

feed serious environmental damage. Forest Policy, 2015 Nepal, focuses on sustainable management of forest, biodiversity, and watershed for adaptation to and mitigation of adverse impacts of climate change. While this policy specifically includes forests, plant resources, wildlife, biodiversity, medicinal plants, and soil and watershed conservation activities in many of these areas it lacks meaningful enforcement.

Nepal's 118 ecosystems range from tall grasslands, wetlands, and tropical and subtropical broad-leaf forests from Terai and Siwalik foothills to alpine meadows. The tropical savannas and alpine meadows are rich in biodiversity. The wetlands also provide ecologically significant refuge for threatened species of flora and fauna and offer a resting ground for migratory and globally threatened bird species. The wetlands also provide high cultural and livelihood aspects for some ethnic groups. The wetlands have been designated as UNESCO Ramsar Convention sites, promoting the conservation of these vital ecosystems. However, the Ramsar Convention itself offers limited direct support for the protection of wetlands.

Nepal's biodiversity hotspots are challenged by overexploitation, invasion by alien species, and pollution. Poaching, illegal wildlife trade and human-wildlife conflict are other major direct threats to forest biodiversity. Rangeland biodiversity is threatened by overgrazing and shrinkage of grassland habitats due to woody species intrusion. Invasion by water hyacinth *(Eichhorniacrassipes)* is a major threat to tropical and subtropical wetlands. Uncontrolled forest fires and destructive fishing are also significant threats. Pollution of land and rivers and other water bodies is widespread. Solid waste disposal in roadsides, forested areas, and water bodies is ubiquitous. Poor road conditions, noncompliant motor-vehicle exhaust, land development, and excessive use of excavating equipment create dust and compromise general air quality.

Forestry is also challenged. Many in the international community promote a program to Reduce Emissions from Deforestation and Forest Degradation in Developing Countries (REDD+) and this effort has identified Nepal's community forestry as a major success. Nepal will likely see an increase in investment in reforestation. But unless the risk of fire can be minimized, changing climate conditions could make reliance on forestry for carbon banking and local adaptation counter-productive both at the local level and regarding regional climate conditions that influence basin-level water availability and sediment loads. These changes could, in turn, affect attempts to support local livelihoods through irrigated agriculture and diversification into local, forest-based activities. Should such strategies fail; local populations will increasingly be forced to rely on combinations of migration and direct support from international institutions to meet their basic needs.

3.3 Watershed and energy

Major rivers in Nepal are sourced by snowpack, glaciers and monsoonal rains, historically released somewhat slowly, by forest cover. But and this must be emphasized, watersheds of Nepal are already in states of physical and biological degradation resulting from improper exploitation. The Department of Soil Conservation and Watershed Management (DSCWM) and its gradual expansion to District Soil Conservation Offices (DSCOs) have been key agencies to address watershed health in Nepal. These soil conservation and watershed management programs also focused on land use and rehabilitation of degraded lands through activities to mitigate land degradation and enhance productivity. But local offices to support such activities are no longer supported by the federal governance system. The absence of such agencies and provincial governments' inability to monitor and manage watersheds creates a serious gap at the present. Increased focus on short-term production has also led to declining soil quality which deserves attention because it supports elements of terrestrial ecosystems (i.e., water, air, flora, and

fauna) which ultimately support human well-being.

Nepal faces several energy deficits and more than a third of the population lacks access to electricity. The country's energy sources are categorized as traditional, commercial, and alternative. Alternative energy is synonymous with new, renewable, and not yet commercially provided energy delivery systems. Traditional sources of energy include biomass fuels particularly fuelwood, agricultural residues, and animal dung used in traditional direct combustion. Commercial sources of energy are fossil fuels and grid-supplied and billed electricity. Alternative sources of energy include micro-hydro, solar, wind power, biogas, briquettes, etc. Biomass, micro-hydropower, and solar are the three major indigenous energy resource bases in the country. Important factors influencing energy demand include increased market engagement, fed by lifestyle changes, transportation, and infrastructure development measured as Gross Domestic Product (GDP) and population growth.

3.4 Urbanization and solid waste

Increasing urban population, especially when coupled with chaotic urban infrastructure "development" feeds growing volumes and, chaotically challenging, concentrations of, typically unmanaged, solid waste. Unruly construction and the resulting chaotic stock of built environment challenge management and "quality of life" and limit opportunity to take full advantage of efficiencies that better-managed urbanization can offer. Increasing urbanization of rural areas also contributes to the extension of poor quality and often difficult to access housing development with poor livability standards which also feed environmental degradation. Such "development" creates built environments that pose an inexcusable risk during extreme weather and geological instability-driven disasters.

Solid waste management is effective when urbanization is scientific and appropriate. Such urbanization supports easy assessment of the

amount of waste generated and thus provides baseline information for effective planning of Solid Waste Management (SWM). The average Municipal Solid Waste (MSW) collection efficiency in Nepal is low and 3 percent of the total MSW is burntcausing human and environmental health, especially to the air (Das et al., 2018). Therefore, scattered solid waste accumulation, often including human excrement, in urban municipalities and transport-intersection locations becomes normalized and makes littering practically universal both spatially and culturally. In the absence of effective Sanitary Landfill Sites (SLS), waste dumps at or near riverbanks, forests, and open public sites proliferate and accumulate. Despite legal "requirements", SWM remains undeveloped and related problems linger and continue to grow as a major municipal and transportation-hub concern. Although there are some efforts toward waste recycling and re-use and composting and waste to energy, these are neither coordinated nor managed at national, provincial, or local levels.

3.5 Climate Change

Climate Change is often referred to as a "wicked problem" because of its inherent complexity and association with numerous unanticipated predicaments. Due to its complexity, climate change requires robust understanding and solutions. The challenge of addressing climate change is especially acute in the HKH given the limited focused research on both the subject and the region (Dixit, 2022). The IPCC's 2021 and 2022 reports indicate the Himalayan region will likely experience increased frequency and intensity of challenging precipitation events. These entail sporadic heavy precipitation, drought, forest fires, and snowmelt, leading to disasters (IPCC, 2021, 2022). Learning from disasters of various types is critical for seeking useful intervention at local, regional, and national levels. CC will likely alter Nepal's river flows ironically resulting in more drought and flood, erosion and sedimentation, and food scarcity (Mirza & Dixit, 1997). Nepal Climate

Vulnerability Study Team suggested a temperature rise in Nepal and likely dryer post-monsoon seasons (NCVST, 2009) with the following scenarios (Box 1).

Box 1. Climate scenarios

Temperature Rise: The Earth's temperature is going up. By 2030, it could be between 0.5°C to 2.0°C warmer. That's noticeable. But by 2090, it could get much worse, with a possible increase of 3.0°C to 6.3°C.

Hot Days: Days when it's really hot are becoming more common. In the 1970s to 1990s, they were rare, but by 2060, they might happen 55% of the time. By 2090, it could be a scorching 70% of the year.

Hot Nights: Nights that used to be cool are getting hotter. From almost never happening in the 1970s to 1990s, by 2060, they might be warm 77% of the time. By 2090, it could be a sweltering 93% of the time.

Rain Changes: Rain patterns are getting unpredictable. By 2030, the amount of rain that falls differently from normal might go up by 14%. But by 2090, it could be all over the place, from 52% less rain to a whopping 135% more rain. This could cause problems for farming and floods.

Such scenarios for climate change chaos will clearly affect livelihoods and general- and food- security. The sequential disaster in Melamchi village in 2021 resulted in fatalities, displacement, the destruction of farmland, and the disruption of livelihoods (ARCGIS, 2021; ICIMOD, 2021, 2021). Similarly, during the post-monsoon harvest season, sporadic rainfall destroyed paddy harvest during October 2021 and reduced the national target harvest (Nepali Times, 2021). This will affect not only the agricultural value chain but will also increase dependence on imports of rice and other commodities. In pursuit of decreasing the effects of climate change, the Government of Nepal must match commitment with actions.

3.6 Legal framework

At the global scale, the consideration of mitigating harm and safeguarding the environment through legal means began to gain prominence at the policy level following the Stockholm Declaration of the United Nations Conference on the Human Environment in 1972. This declaration led to a commitment to various conventions that are pertinent to climate change. (Table 5).

Table 5. Selected international commitments to CC

Commitment	Date	Objective of the commitment
Air Convention	1979	Protect human environment against air pollution
Vienna Convention	1985	Protect ozone layer
Montreal Protocol	1987	Phase-out ozone-depleting substances
Framework Convention on CC	1992	Prevent human interference with climate system
Kyoto Protocol	1997	Reduce GHG emission
Paris Agreement	2015	Climate change mitigation, adaptation, and finance

Source: Author's own

Becoming a signatory to the international conventions, treaties and protocols, Nepal formulated various thematic legal documents. Based on the above practice, the "environment" definition has also expanded to include the need for understanding effects on socio-ecological well-being. These include human health and safety, biodiversity, soil, water, air, climate and landscape, use of land, natural resources and raw materials, protected areas and designated sites of scientific, historical, and cultural significance, heritage, recreation, and amenity assets, and livelihood. Given this trend of change and evolution, inclusive green growth and climate-smart strategies offer opportunities for sustainable growth and reduction in poverty levels.

In line with the above, the constitution of Nepal guarantees rights to live in a clean and healthy environment offering rights and responsibility to all levels of governance to enhance environmental-friendly development goals and control pollution in their respective areas. Similarly, policies also focus on renewable energy to support a reliable supply of energy and pollution control. A constitutional body called the National Natural

Resources and Fiscal Commission (NNRFC) is the highest level of the institution that is set to address balanced development with protection and access to ecosystem services in Nepal.

3.7 Environmental governance

Supporting governance capacity for green growth means embedding an understanding of natural capital and its characteristics at all levels including some for which many managers and policymakers in Nepal have little or no knowledge. According to the OECD (n.d.), the following are key areas of concern for green growth at governance and monitoring levels that require appropriate skills and knowledge:

- Identifying environmental challenges, priorities and their implications for development
- Monitoring environmental changes through green accounting
- Sending price signals that prompt changes in behavior
- Reforming environmental fiscal systems to encourage more sustainable resource use.

Greening development requires capacity. The green development context needs to extend beyond monitoring agencies and should be harmonized within all aspects of governance such as finance, planning and line ministries, civil society groups, private agencies, and communities. In addition, it also requires contextually (i.e., requiring country-specificity), embedding "greening" into fiscal policy and development planning processes, and backstopping green-supporting stakeholders.

3.8 Natural and social capital-based tourism

Tourism is intricately linked to GEC because ecosystem-based attractiveness depends on water, energy, biodiversity, food, and

landscapes. Although tourism brings significant negative impact on natural resources and the environment, it also contributes to conservation by enhancing awareness and livelihood opportunities and, it is complementary with and a form of diplomacy. Nepal's protected areas encourage nature-based tourism. Nature tourism generates awareness, employment, and economy. It can thus both promote green growth and contribute to sustainable development. Nature-based tourism, ecotourism, and sustainable tourism are environmentally valuable and socio-economy supporting (Kline, 2001). Tourism-based environmental learning enhances ownership and management that connect social and ecological contexts, especially when supported by instruction as with well-developed "interpretive centers". Hence, cultural connectivity with nature offers both community and multicultural resilience.

Cultural tourism is an especially important aspect of both sustainable development and diplomacy (Mousavi et al., 2016). It covers a wider range of interrelated activities and growth and is more easily developed than other types of tourism (Girard & Nijkamp, 2009; Ioan-Franc & Iştoc, 2007). UNESCO defines culture as the following.

> *"Culture is a set of distinctive spiritual, material, intellectual and emotional features of society or a social group. It encompasses, in addition to art and literature, lifestyles, ways of living together, values systems, traditions and beliefs".* (UNESCO, 2009, p. 9)

Despite efforts and understanding of the contribution of culture to the economy, it is still considered as "marginal and undervalued". This requires further efforts to revitalize existing but neglected heritage sites. Budgetary allocation for archeological and heritage site restoration and preservation is under-prioritized in Nepal's five-year plan. Embedding culture into the economy can become a substantial value addition to the way Nepal presents itself in tourism. Such activities place green growth in the overall economy to sustain local possibilities of employment and curtailing out-migration. They also, and predictably with increasing power, support a an unofficial, but potentially very powerful, kind of

grassroots diplomacy as planetary culture awakens to its potential to influence ecosystem services and to teach about those services, erodes in the face of the global reality of ecosystem decline.

3.9 Low-carbon initiatives

3.9.1 Green growth

The UNEP defines a green economy as enhancing " human well-being and social equity" with reduced "environmental risks and ecological scarcities". It is functionally related to increased investments in renewable energy, low-carbon transport, cleaner technologies, and sustainable agriculture (UNEP, 2010). The Outcomes Document of the United Nations Conference on Sustainable Development (UNCSD) states that reducing carbon pollution contributes to reduced poverty, sustained economic growth, enhanced social inclusion, improved human welfare with decent work-life and healthy ecology (UNEP, 2010). Embedding green growth in national, provincial, and local level policies and actions helps achieve socio-ecological balance. As unsustainable natural resources use impacts population, climate change, and risks to food security shortages (OECD, n.d.). Hence, transition to a greener development path is imperative. However, empirical research suggests that "resources use and carbon emissions" is a misguided approach to addressing ecological and climate change threats (Hinkel et al., 2020). Thinking beyond the green approach is necessary for meaningful policy intervention. Nepal needs to "tiptoe" rather than "copycat" policy intervention by internalizing the "prevention rather than cure" approach in action. Such strategies can be successful by engaging in strategic environmental and social assessments before we embark on something new.

The principle of "what goes up must come down" is a well-established concept that exposes the inherent fallacy of pursuing exponential growth over the long term. This principle aligns with the natural

dynamics of systems and highlights the fundamental contradiction of seeking endless expansion within a dynamic system. Famous system thinker, Kenneth Boulding said "Anyone who believes exponential growth can go on forever in a finite world is either a madman or an economist" (Boulding, 1973). The larger the economy gets, the more difficult it becomes to decouple growth from the impact it generates, and thus decoupling perceived or definitional well-being from material throughput is the best option for supporting sustainability (Jackson & Victor, 2019). Or, as became the signal icon of early mid-twentieth Century architect MiesVandereau, "Less IS More"(Van Der Rohe, 1988). From an ancient perspective, the interconnection between birth and death is intricately linked by the concept of Karma, as elucidated in the Upanishads--the ancient text embodying profound spiritual wisdom. Karma represents a profound spiritual awareness that permeates the understanding of existence.

According to the Upanishads, Karma encompasses the notion that actions and intentions have consequential effects, both in this life and potentially in future lives. It suggests that individuals are bound to the consequences of their thoughts, choices, and deeds, forming a continuous cycle of cause and effect. In this spiritual framework, the concept of Karma goes beyond a mere cause-and-effect relationship between birth and death. It encompasses a deeper understanding of the interconnectedness of all beings and the universe as a whole. It implies that one's actions and intentions in the present life can shape future circumstances and experiences, ultimately influencing the journey of the soul across lifetimes.

The Upanishads, with their profound insights, offer a contemplative perspective on the intricate relationship between birth and death, highlighting the significance of Karma as a spiritual force that weaves the fabric of existence. By recognizing the interconnected nature of our actions and their consequences, individuals are encouraged to cultivate awareness, mindfulness, and moral responsibility in order to navigate

the cyclical journey of life with wisdom and compassion.

Hence, in accordance with the ancient wisdom of Karma, the outcomes of human actions and their associated consequences do not usually manifest immediately. Instead, we come to realize that escaping the repercussions of our own actions, both seen and unseen, is ultimately impossible. This understanding finds expression in the epic story of the Mahabharata.

The Mahabharata narrates a profound truth – that the effects of our actions do not unfold instantly. It underscores the idea that the consequences of our choices and deeds, whether perceptible or hidden, inevitably catch up with us over time. Through the Mahabharata, we discern the intricate interplay between human agency and the unfolding of destiny. It teaches us that our actions and intentions, even when seemingly unnoticed or forgotten, eventually manifest in some manner, influencing the course of our lives and the broader cosmic order.

Engaging with the Mahabharata imparts timeless wisdom, reminding us to approach our actions with thoughtfulness and an acute awareness of their long-term implications. It serves as a poignant reminder that the consequences of our actions, whether visible or concealed, are an integral part of our existence and reverberate through the fabric of time.

This perspective rooted in the Mahabharata and the concept of Karma unveils a profound truth: that human actions bear consequences that cannot be indefinitely evaded. It encourages us to cultivate mindfulness, ethical conduct, and a sense of accountability, enabling us to navigate the intricate tapestry of life with wisdom and integrity. It is articulated in the Mahabharat epic story as follows.

> *"man lives off the seeds of his deeds, no man inherits the good or evil act of another man. The desires and actions result into joy and sorrows at visible and invisible level" -Mahabharata*

The above verse from the Mahabharata highlights the concept of individual responsibility and the consequences of one's actions.

According to this philosophy, each person is accountable for their own deeds and experiences the outcomes, whether positive or negative, in the form of joy or sorrow. It emphasizes the idea that one cannot inherit the karmic effects of another person's actions.

In the Sanatan system, Karma occupies a central and foundational role. At its essence, Karma embodies the principle of causality, signifying that our actions yield outcomes, whether they occur immediately or at some point in the future. This principle is intricately interwoven into the fabric of Sanatan Dharma (the eternal religion) and exerts its influence across diverse dimensions of existence, encompassing life, ethics, and spirituality. It posits that each action, thought, or intention carries repercussions, which may materialize in this lifetime or in subsequent ones. Within this belief system, it is held that an individual's actions determine their destiny and that they possess the agency to craft their own life experiences through their choices and deeds.

This philosophical viewpoint encourages personal responsibility, self-reflection, and mindfulness in one's actions. It suggests that individuals have agency in shaping their lives and that the outcomes they face are a result of their own choices and actions. By understanding the connection between actions and consequences, one is encouraged to act with awareness and cultivate positive intentions.

The Mahabharata, one of the major ancient texts, contains numerous moral teachings and philosophical insights. It explores various aspects of human existence, including ethics, duty, righteousness, and the consequences of human actions. The quote you shared reflects the broader themes of personal accountability and the recognition that individuals have the power to shape their own lives through their thoughts, desires, and actions.

Based on the sources of data, key areas of intervention are infrastructure, management of natural capital and agriculture, strengthening environmental governance and management capacity, responding to climate change and, especially adjusting the mindset from which

we address problems (Meadows "Ways to intervene in a System") (Meadows, 2008). Highlighting the green economy concept is especially important for mountainous, forest, and biodiversity-rich countries like Nepal. International informal movement increasingly encourages more accurate valuation of natural capital and compensation for ecosystem services providers by creating and implementing economic incentives, financial rewards, and transfer of payments. The UNEP defines the role of forests in green growth as:

> *"forests are a critical link in the transition to a green economy-one that promotes sustainable development and poverty eradication as we move towards a low-carbon and more equitable future". (UNEP, 2011)*

3.10 Development Agenda

Every development agenda includes environmental and social issues. Nepal's development partners support the sustainable development goals of Nepal in the form of activities as well as policy reforms in environmental governance. Similarly, Nepal's bilateral and multilateral donors (e.g., DFID, JICA, SDC, SNV, USAID, UNDP, WB, ADB, and INGOs) also have similar "Global Goals" through their country priorities. For example, UNDP prioritizes SDGs work in the spirit of reduced poverty (Goal No. 1) by partnership (Goal No. 17) and pragmatism to make appropriate choices to improve life, in a sustainable way, for future generations.

Similarly, other development agencies support the Government of Nepal Climate Change (NCI) programs or green growth activities (e.g., Low-carbon emission strategy, climate, and energy plan). But, since LCI started in Nepal in 2010 (Table 6), it has been limited to dialogues and seminars (Bhuju et al., 2014).

Table 6. History of low-carbon initiatives

Organization	Publication/Announcements	Date
IEA	Clean Energy New Deal	2020
IMF	Invest in green sectors, scrap subsidies to fossil fuels and use carbon taxing	2020
UNESCAP	Low Carbon Green Growth Roadmap for Asia and the Pacific	2012
OECD	Green Growth and Developing Countries: A Summary for Policy Makers	2012
UNEP	Green Economy Initiative	2008
WB	Inclusive Green Growth: The Pathway to Sustainable Development	2012
ICC	Green Economy Roadmap	2010

Source: Author's own

Prior to the mainstreaming of LCI and other interventions at thematic levels of development, guidance toward identifying key leverage points based on "good" science, proactive policy development, and well-developed methodology are essential. Such approaches can help decision-makers identify and prioritize problems, both existing and/or upcoming, and set the agenda for policy interventions (UNEP, 2010).

Chapter 4
Study Synthesis

4.1 Introduction

Grounded Theory-based synthesis systematically organizes individuals' expressions to create a subsequent thematic section, preserving their core essence. Guided by Grounded Theory principles, this method structures data and presents prevailing themes. The subsequent section provides detailed elaborations on six thematic contexts related to grassroots climate change diplomacy.

4.1.1 Context 1 - Governance

Climate change interacts with poor governance to weaken intervention. Attempts to delegate planning and decision-making to smaller governmental units at provincial and municipal levels pose challenges fed by limitations, especially of resources, skills and commitment, within which these governments operate. The phenomenon of "decentralization of corruption" retards effective policy intervention and action to address either today's aspirations or environmental conservation and capacity development for present and future generations. Narrow understanding fed by prioritization of market-dominated economic "growth" encourages consumption and feeds dependence on outside control. Inefficient development investment by provincial, district, and urban and rural municipal governments limits availability of basic services and infrastructure, which, along with growing local unemployment

encourage outmigration, retard local cultural capacity development and meaningful community participation and planning toward enhancing appropriate intervention.

4.1.2 Context 2 - Livelihood

Ineffective governance feeds declining cultural cohesion and livelihood prospects rooted in climate change-driven vulnerabilities and, related, declining ecosystem services resulting in weakened land, collective resource and agricultural productivity and declining water, and food availability. These drivers of change intensify a catastrophic cycle of eco systemic and productivity degradation, community collapse and reduced opportunity and increasing poverty-driven outmigration. Increasing community resilience in face of climate variation-driven challenges requires adaptation based on awareness of drivers of and possible responses to market-weakened rural culture and resulting endemic poverty.

4.1.3 Context 3 - Conflict

Climate Change impacts both add to and are amplified by local and transnational conflict's erosion of peace and security. Climate disaster and displacement weaken many communities' ability to cope and feed both social and economic hardships and border-transcending security challenges. Resulting conflict threatens local communities and governmental organizations at all levels. As with national security, cross-border movements of people challenge the protection of citizens. Resulting implications for rights, security, and sovereignty include some individual's or group's loss of statehood caused by neighboring nations claiming control of territory. Such concerns feed continuous border security conflict and divert focus and resources from pursuing sustainable development goals. And development influence and intervention by multiple western and revisionist states weaken local initiative and autonomy (i.e., India and China)

4.1.4 Context 4 - Natural capital

Increased in- and out-migration leads to competition over natural resources, coping responses, and free riding on natural resources by powerful and often stronger, self-aggrandizing social entities sometimes from either side of porous borders. Such behavioral patterns weaken aspects of human well-being and often increases hopelessness and helplessness in already weak communities. Unsustainable and scientifically inappropriate uses and management of resources feed disasters which worsen poverty of households and communities and increase domestic, local and regional conflict. The term 'natural capital' was first used in 1973 by E.F. Schumacher in his book Small Is Beautiful (Schumacher, 2011) and was developed further by Herman Daly, Robert Costanza, and other founders of Ecological Economics, as part of a comprehensive critique of the, especially eco systemic shortcomings of conventional economics.

4.1.5 Context 5 - Collaboration

Nepal faces challenges to accessing and utilizing support officially offered to developing countries by multilateral entities including support for adopting low-emission, climate-resilient development trajectories and bilateral climate aids from entities like the Climate Investment Funds and Green Climate Fund. Often leaders in developing countries seek internationally available funds without committing to clear pathways for activities for addressing climate change via action on governance, livelihood, conflict, and green economy development that foster appropriate change. Mere monetary commitments are not significant for altering climate change impacts that increase poverty or its impacts. Differing structures with overlapping focus areas often create redundancies that feed competition within the political process for access to resources with no, or minimal, plans or concern for their effective use toward designated purposes. There are implications for international cooperation from climate change's impact on shared or

under-marketed international resources. These possibilities are neither negotiated nor collaborated with Nepal's immediate neighbors China and India which respectively emit 28 (ranked 1st) and 7 (3rd) percent of the total global carbon dioxide emissions.

4.1.6 Context 6 - Grassroots diplomacy

Standard international relations-defined diplomacy is typically treated as the only means to achieve the SDGs and address climate change because of the nature of impacts that cross political boundaries. Active foreign policy requires a focused approach that facilitates appropriate outcomes. In addition to that effort, "public diplomacy" has also become prominent. While the UN is the largest diplomatic forum for engaging with issues at multiple levels, bilateral relations between countries reflect fiscal interests of recipient countries and political and market interests of donor countries. But especially because official diplomacy often seems to lag behind climate change related problems and issues. Grassroots diplomacy becomes common. Anyone can participate in a diplomat-like roles representing place and purpose in academic, philanthropic, professional, spiritual and other grassroots forums at journalistic and practitioner levels. Academic narratives (Table 6) and grassroots organizational perspectives are regularly presented in local, national and international forums like COP26, and as such include children's and philanthropist's voices on the world stage and testify to the fact that such "grass roots" efforts can exert influence. Climate scientists around the world are engaged from grassroots to global levels in the climate change debate exerting influence through publications, outreach, lobbying and policy engagement. Table 7 summarizes the climate change prognosis from highly influential scientists' latest publications as presented in Reuter's Hot List. While few of these groups of scientists come from the Global South, the need for understanding the "unequal global distribution of knowledge and expertise" calls for a need to seriously look at local and regional as well

as global concern (Hunter et al., 2021). Knowledge generated from the Global South can be highly valuable for addressing many sustainable goals. Traditional and non-traditional diplomats and governments need to engage in dialogue and collaboration on matters affecting citizens' futures with more open interaction regarding both under addressed problems and desired initiatives related to climate change. In the age of increasing complexity and uncertainty participatory and deliberative democracy needs to be constantly reimagined. It is especially important when politics has become uncivil, polarized and where spreading of misleading information becomes "normalized" and often feeds facile generalizations of complex and complicated problems especially the "climate-challenged and fragile public sphere" (Curato et al., 2020).

Table 7. Top ten climate scientists

Rank	Climate scientist	Conclusion from the recent publication
1	**KeywanRiahi** International Institute for Applied Systems Analysis	Urban GHG emission mitigation is needed to achieve climate-neutrality by the end of 2020 (Gurney et al., 2022).
2	**Anthony A Leiserowitz** Yale University	Plant-based diet is effective means to reduce carbon footprint to mitigate climate change(Lacroix et al., 2022).
3	**Pierre Friedlingstein** University of Exeter	Human engaged landscape alterations needs to be reduced to control impact of disasters (Rosan et al., 2022)
4	**Detlef Peter Van Vuuren** Utrecht University	NDCs and currently implemented national policies do not address the temperature limit as per the Paris Agreement. Good Policy Practices (GPP) alone are not enough to close emission gap (Baptista et al., 2022)
5	**James E Hansen** Columbia University	Need to align agriculture and climate policy for food and soil security (Beerling et al., 2020)
6	**Petr Havlík** International Institute for Applied Systems Analysis	Emissions reduction and agricultural market policies together with better representation of landuse and greenhouse gas emissions is an important for effective modeling outcome (Fujimori et al., 2022)
7	**Edward Wile Maibach** George Mason University	Engagement of lawmakers in informing impact of climate change and environmental justice is imperative (Rublee et al., 2022)
8	**Josep G Canadell** Commonwealth Scientific and Industrial Research Organization	The Second Regional Carbon Cycle Assessment and Processes study with a decade of data help understand greenhouse gas increment(Poulter et al., 2022)

Rank	Climate scientist	Conclusion from the recent publication
9	**Sonia Isabelle** Seneviratne ETH Zurich	Agricultural management has complex and non-negligible impacts on the local climate and highlights the need to evaluate the representation of land management (Gormley-Gallagher et al., 2020)
10	**Mario Herrero** Commonwealth Scientific and Industrial Research Organization	As malnutrition and poor health outcomes are increasingly apparent, transitioning to the pacifics food system to a hybrid form that supports historical continuity with healthy regionally-produced food is important(Andrew et al., 2022).

Source: Reuters Hot List (www.reuters.com)

Academics, despite their commitment to objectivity, often serve diplomatic interests, as they articulate issues of concern for present and future scenarios including those related to climate change.They represent the cause and warn of the need for action. Such academic diplomats can be citizens of either 'powerful or powerless' countries while articulating climate change-related concerns regarding socio-ecological issues or market- or other force-induced 'disorder'." This statement highlights the crucial role played by academic diplomats in advocating for climate change action and raising awareness about its associated challenges. These diplomats possess the knowledge and expertise to address the complex issues at the intersection of climate change, society, and the environment, regardless of their nationality. The actions of these academic diplomats not only draw attention to the contributions that "small" nations can make to global causes but also challenge the assumption that citizens from less influential countries are inherently powerless. They serve as representatives of their respective nations or communities, illustrating that every country, regardless of its size or geopolitical influence, has a role to play in addressing climate change and its impacts. This recognition emphasizes the need for collective global action to tackle the urgent environmental challenges we face.

Moreover, the ability of academic diplomats to engage in one-to-one interactions facilitates the development of meaningful global relationships. By directly connecting with individuals and communities,

they can build trust, foster understanding, and promote cooperation. This engagement is not limited to a single level but extends from the local community level to global platforms. As a result, these diplomats contribute to the emergence of dynamic and adaptive leaders who actively work as agents of change, operating at various scales of influence and action (Payne et al., 2011).

The rise of social media platforms has provided a new and growing avenue for grassroots public diplomacy. Academic diplomats can leverage social media engagement to disseminate information, mobilize support, and amplify their advocacy efforts. However, it is essential to recognize that the use of social media is not without its challenges. Inevitable errors or misinterpretations can occur, emphasizing the critical role of due diligence in all negotiations, whether they are formal or informal (Collins & Bekenova, 2019). Responsible use of social media requires thorough research, fact-checking, and responsible communication to ensure accurate and impactful messaging.

In summary, academic diplomats, regardless of their nationality, play a significant role in advocating for climate change action and addressing socio-ecological issues. Their actions highlight the contributions that "small" nations can make to global causes and challenge the notion of powerlessness. Engaging in one-to-one interactions and leveraging social media platforms enable them to build meaningful global relationships and foster the development of dynamic and adaptive leaders. However, careful attention must be paid to due diligence in social media use to avoid misinformation and maximize the effectiveness of advocacy efforts (Payne et al., 2011; Collins & Bekenova, 2019).

One example of academic diplomacy in the context of climate change is YOUNGO, an international network of youth organizations. YOUNGO's primary objective is to strengthen meaningful youth engagement within the United Nations Framework Convention on Climate Change (UNFCCC) to influence climate crisis discussions and actions. It serves as a platform for young people to come together, share

ideas, and advocate for more ambitious climate policies and actions.

Another notable initiative is the Youth Advisory Group on Climate Change to the UN Secretary General. This group was established to provide a platform for young people to actively participate in addressing the climate emergency. It enables youth representatives from various backgrounds and regions to offer their perspectives, insights, and recommendations to the UN Secretary General on climate-related matters.

In the United States, the Council on Foreign Relations (CFR) is an influential think tank dedicated to enhancing understanding of global affairs and foreign policy decisions. As part of its efforts, the CFR has developed a platform called "model diplomacy." This interactive setting allows participants to engage in role-playing exercises that simulate the deliberations of the U.S. National Security Council and the UN Security Council. Through this dynamic simulation, participants can immerse themselves in the complexities of diplomatic decision-making and gain insights into historical and hypothetical diplomatic challenges (Council on Foreign Relations, 2022).

These examples demonstrate how academic diplomacy can be applied in different contexts to address global challenges such as climate change. They provide platforms and opportunities for youth engagement, knowledge sharing, and immersive learning experiences that aim to shape policies, influence decision-makers, and foster a deeper understanding of complex global issues.

4.1.7 Causal Loop Map

The System Dynamics Causal Loop Mapping (CLM) technique serves as a powerful tool to illustrate and analyze the interrelated narratives derived from various sources. These narratives include the DPSIR (Drivers, Pressures, State, Impact, and Response) framework, participants' perspectives, recent publications by climate scientists

and their collaborators, as well as the author's own observations. By integrating these diverse sources of information, the CLM provides a comprehensive understanding of the complex dynamics underlying the state of the environment.

The web of interactions depicted in Figure 6 is the result of thematic analysis conducted in this chapter. Through this analysis, key categories and themes emerged, revealing the interconnectedness of various forces and contexts. The balancing and reinforcing loops depicted in the CLM are fundamental structures of Systems Thinking, highlighting the emergence of complex interactions and their subsequent effects. This collective understanding of interactions among key forces and contexts promotes deeper insights into the complex dynamics of the system under study.

The CLM further highlights the presence of characteristic reinforcing and balancing loops, which are indicative of the emergent vulnerabilities associated with climate change, livelihood, governance, socio-ecological capital, conflict, collaboration, and grassroots diplomacy. These loops demonstrate how changes in one aspect of the system can lead to feedback effects that either amplify or counteract the initial change. By visualizing these loops, the CLM helps elucidate the interconnectedness and interdependence of these different aspects, shedding light on the intricate relationships between social, ecological, and environmental factors. These three major aspects, collectively known as social, ecological, and environmental facets, are vital components of the broader framework of the Landscape of Climate Impact (LCI).

The use of CLM in this chapter enables the exploration of narratives derived from multiple sources, providing a comprehensive understanding of the complex dynamics of the environment. The mapping of reinforcing and balancing loops helps visualize the emergent vulnerabilities and interconnectedness of various factors, contributing to a deeper appreciation of the social, ecological, and environmental dimensions within the LCI framework.

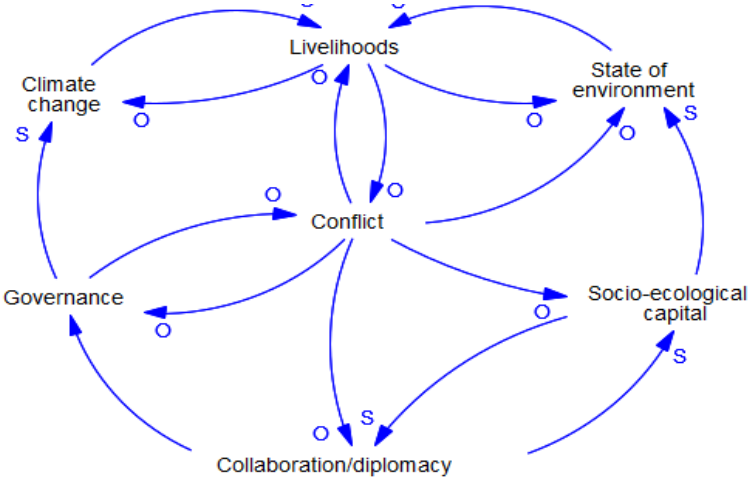

Figure 6. Key categories interacting in the system

Source: Author's own

In simpler terms, the CLM reveals important aspects of the interconnected system through the use of arrows with opposite (O) and same (S) signs. The same sign (S) means that if one variable increases, the other variable also increases, while the opposite sign (O) means that if one variable increases, the other variable decreases. In Figure 6, we can see the complexity inherent in the climate system, showcasing how different factors interact with each other. On the other hand, Figure 7 illustrates how intervention through governance, diplomacy, and innovation can lead to low-carbon initiatives (CI), creating employment opportunities and sustainable livelihoods. These initiatives have a positive impact on several Sustainable Development Goals (SDGs), creating a win-win situation that promotes sustainability. To promote this grassroots diplomacy and encourage informed policy decisions, it is essential for the Government of Nepal to play an active role. This includes identifying priority sectors and selecting the most effective policy instruments to achieve desired outcomes and enhance the Landscape of Climate Impact (LCI). By doing so, Nepal can move towards a more sustainable future.

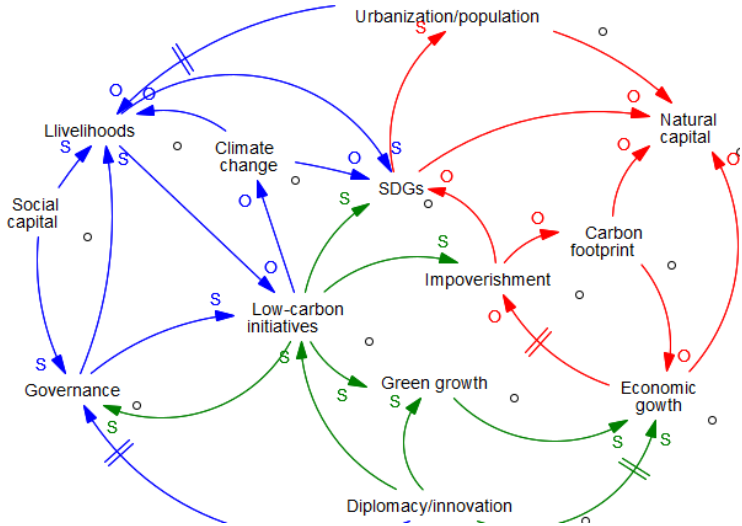

Figure 7. Places of intervention

Source: Author's own

Spontaneously accelerated urbanization leads people to live on unprepared sites lacking proper infrastructure (roads/transportation, electricity, water supply and solid waste systems) which bring both high risk and Climate Change-inducing chaos. Countries with inefficient unproductive cities often lag behind in achieving effective development (Sharma, 2016). To reap urbanization's potential benefits and efficiencies, including increased safety and access to meaningful jobs and energy efficiency, urban expansion must be designed to promote productive informal economic interaction and smooth, minimally polluting, rural-urban linkages ((UNACLA, 2012). Roads mean economic opportunity which encourages desperate unplanned and under-supported chaotic squatter settlements.

Uncontrolled and haphazard "urbanization," often triggered by poorly planned road expansion, leads to disorder, accidents, and constant repairs of roads and related infrastructure, resulting in inefficiency. Any infrastructure development, including roads, requires social

and environmental safeguard measures. These measures necessitate investments that address the growing transportation demand and also consider stormwater and drinking water management, electrical connectivity, communication networks, fuel supply, and sewerage systems. Proper maintenance and management, supported by careful planning and adequate funding, are essential for road networks. Without these, informal road and infrastructure expansion can undermine safety and efficiency instead of enhancing them.

Failure to plan for and invest in smooth transitions from rural toward urban communities typically leads to, conflicting and often dangerous, mixing of resource use which typically include commercial, transport and residential uses. And, also typically, ignoring basic food, water and health—including waste management, childcare, educational and spiritual supporting—resources. Such failures feed inefficient and unanticipated resource stresses, including aggressive and illegal—or at least antisocial and/or anti-ecological-rent seeking activities that further diminish potential for safe and healthful living experiences. These problems are compounded by social and natural capital degradation which further diminish community collaboration, resilience and institutional, ecosystem, and human—including both individual, family and community—capabilities that are sometimes called human capital.

Such degradation enhances vulnerabilities which lead to cultural degradation, including weakened economic, cultural, community and family capacity and, sometimes, violence, and ecological degradation and general hopelessness. Such hopelessness, in turn, feeds vulnerability of many kinds. These include, especially, degraded ability to respond to human (especially conflict driven) and "natural" challenges and disasters, which, like Climate Change, are made worse by human causes like those discussed above. They further invite thoughtful diplomatic responses at all levels.

Conclusion

Grassroots climate diplomacy emerges as a critical element in shaping Nepal's development narratives by engaging local communities. This approach recognizes that the challenges of climate change and sustainable development are complex and interconnected, requiring a holistic understanding of the system in which they operate. By actively involving local communities in climate diplomacy, a feedback loop is created, allowing for a continuous exchange of information, ideas, and perspectives. This feedback loop enables a deeper understanding of the local context, including the unique challenges, vulnerabilities, and aspirations of different communities. Such understanding is essential for developing effective and tailored solutions that address the specific needs of each community.

Grassroots climate diplomacy also recognizes the interdependencies within the system. By empowering local communities to actively participate in decision-making processes, a sense of agency is fostered, enabling them to become agents of change. This shift from a top-down approach to a bottom-up approach acknowledges that solutions to climate change and sustainable development are best generated when the entire system is engaged, and diverse perspectives and knowledge are integrated.

The integration of traditional knowledge and practices into climate change strategies exemplifies a systems thinking approach. Traditional knowledge, accumulated over generations, represents a

valuable resource for building climate resilience. By recognizing and incorporating this knowledge into development narratives, grassroots climate diplomacy taps into the collective wisdom of communities, enriching the overall understanding of the system and facilitating the development of context-specific and innovative solutions.

Grassroots climate diplomacy recognizes the interconnectedness between awareness, advocacy, and policy change. By mobilizing communities and amplifying their voices, grassroots movements create a positive feedback loop, influencing decision-makers and demanding action. The resulting policy changes then feed back into the system, impacting the awareness and empowerment of communities. This interconnectedness strengthens the capacity of the system to respond to climate challenges effectively.

Moreover, collaboration and networks are crucial aspects of systems thinking in grassroots climate diplomacy. Recognizing that climate change is a complex and multifaceted issue, collaboration brings together diverse stakeholders from different scales, including communities, civil society organizations, and other actors. By fostering collaboration and creating networks, grassroots movements facilitate the sharing of knowledge, experiences, and resources. This collaborative approach strengthens the overall resilience and adaptive capacity of the system, allowing for more effective collective action. Through grassroots climate diplomacy, Nepal can embrace a more inclusive, equitable, and responsive pathway towards a sustainable future.

Everest's highest glacier has lost 2,000 years of ice in 30 years.

- National Geographic 2022

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