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Conceptualizing Regional Environmental Integration Countering Vulnerability To Climate Change: A Case Study Of Carec Member Countries

Dr. Hassan Daud Butt[1] , Dr. Zainab Ahmed[2] , Urooj Aijaz[3]

ABSTRACT:

The twenty-first century is marked by a myriad of nascent phenomena in which Climate Change qualifies to be on the top. The academic discourse on the environment had penetrated the national security conceptualization during the Cold War. The actual transformation triggered in the aftermath of the Post-Cold War era in the ake of vivid manifestations of Climate Change. The conceptualization of security, development and economic integration-initiated tilting more towards regional solutions right at the peak of globalization in the backdrop of a post-structural paradigm departing from the modernist and positivist approaches. Similarly, climate and environment became foremost issues implicating the structural foundations of states. The most plausible instance is Pakistan which has been among the top ten most vulnerable to Climate Change countries, yet the devastating floods of 2022 established its position to be the victim of global ignorance of the catastrophe. The devastating floods of 2010 inundated one-fifth of the country costing about USD 10 billion which exacerbated to USD 30 billion approximately, while one-third of the country was submerged in 2022. The issue of Climate Change cannot be subjected to a single country yet it is a global phenomenon with the nature, scope, and extent of this phenomenon are trans-boundary, requiring an overarching response. [3]The world is already late in responding to the human-induced devastation of nature. The issue of environmental devastation is affecting every sector and every country at varied scales. As regionalism elevates to be the solution to economic, energy, security, and power balancing and development woes the environmental integration of regions to streamline environmental regulations, legislations, and actions can have a considerable impact for the region and beyond, as the European Community developed and later carried forward by European Union. One of the leading benefits of regional economic integration is to distribute the benefits of development to developing partners in the region which can be a stimulating factor in environmental cooperation also. The CAREC member countries accounting for a considerable global economic pie, energy resources, water, agriculture, industry and population can have a viable regional structure for the environment. This study aims at conceptualizing and exploring the viability of regional environmental integration of CAREC member states to meet the global challenge and protect natural resources. In the midst of these complex scenarios

[1]Associate Professor, Department of Management Sciences, Bahria University Islamabad. hdb4049@gmail.com
[2]Assistant Professor, Seeta Majeed School of Liberal Arts and Social Sciences, Research Fellow BNU Center for Policy Research, Beaconhouse National University; zainab.ahmed@bnu.edu.pk
[3]Faculty Department of H&SS, Bahria University Karachi. Uroojaijaz.bukc@bahria.edu.pk

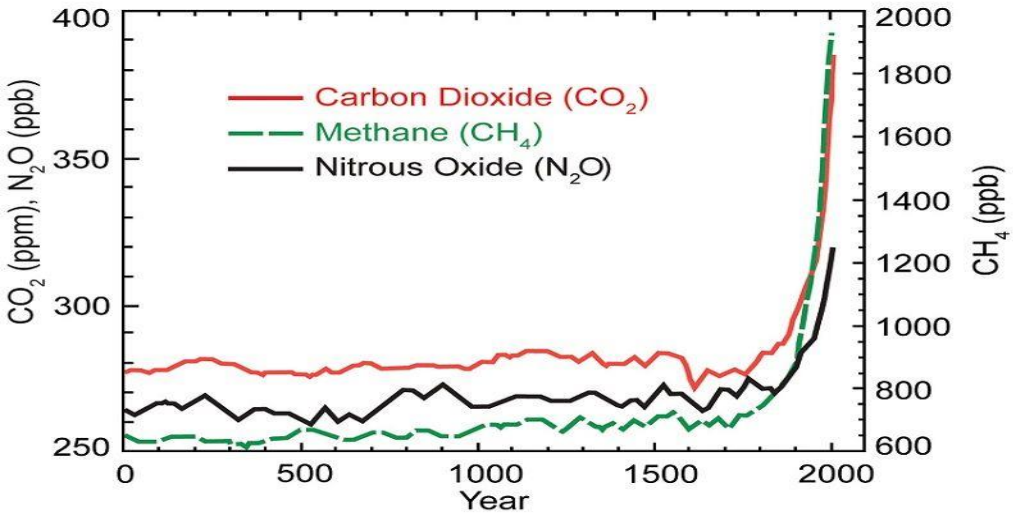
impacting SDGs performance, a focus on prevention and investments on environmental resilience economic models need to be improved to work together to strengthen resilience in the region. How can the regional countries, in coordination with the global community, support poor countries in their efforts to address the crises facing the development.

KEYWORDS: *Environmental Security, Regional Economic Integration, Climate Change, Green Economy, Green Industry, Regional Environmental Security Integration.*

INTRODUCTION:

Environmental problems like biodiversity loss, extreme weather events, and air pollution are gradually limiting regional sustainable development in the context of global climate change and urbanization (Newbold et al. 2015; Bathiany et al. 2018). The need for efficient and long-lasting solutions is imperative as a result of environmental degradation and change. One of the most effective strategies for addressing these issues and fostering resource conservation, economic growth, and environmental friendliness is the integrated green response. A multilevel approach to environmental security, involving global, regional, national, and subnational decision-making levels according to the subsidiarity principle, that can provide a more dynamic framework for action than the state-centered approach that dominates security thinking and policy Landscape is needed in the growing need for a concentrated and integrated approach. Sustainability focuses on the capacity of landscapes to sustainably improve human well-being and offer fundamental ecosystem services in order to promote sustainable development. Environmental security and regional environmental integration are interconnected concepts that address environmental challenges at both national and regional levels. They focus on safeguarding ecosystems, natural resources, and the environment to promote sustainable development and ensure the well-being of present and future generations. Regional environmental integration seeks to create a cooperative and collaborative approach to address common environmental challenges effectively and promote sustainability for the benefit of all participating countries and their populations. It requires political will, mutual trust, and a long-term commitment to achieve positive outcomes for the environment and future generations.

Figure 1: GHG Emission



Source: (Agency, 2017)

The regional integration is the imminent and sought after solution to the problems of economies and resources. The nature of environmental issues implicating integration water, food and energy require solutions in vicinity as the causes are also regional. The CAREC (Central Asia Regional Economic Cooperation) member countries; Armenia, Azerbaijan, China, Georgia, Kazakhstan, Tajikistan, Uzbekistan, Turkmenistan, Kyrgyzstan, Russia and Pakistan have unique geography adjacent to each other having immense opportunity to develop the economically integrated corridor. However, the environment seems to be a major qualifying issue knitting all these countries to develop an environmentally integrated region with huge potential of green economy and green industrialization. This study is aimed at scrutinizing the environmental issues of CAREC countries, and their potential to develop an environmentally integrated region framework. This study revolves around two questions; 1) how is the environment a major issue in CAREC member countries? 2) How can an environmentally integrated region develop among CAREC member countries?

LITERATURE REVIEW & DISCUSSION:

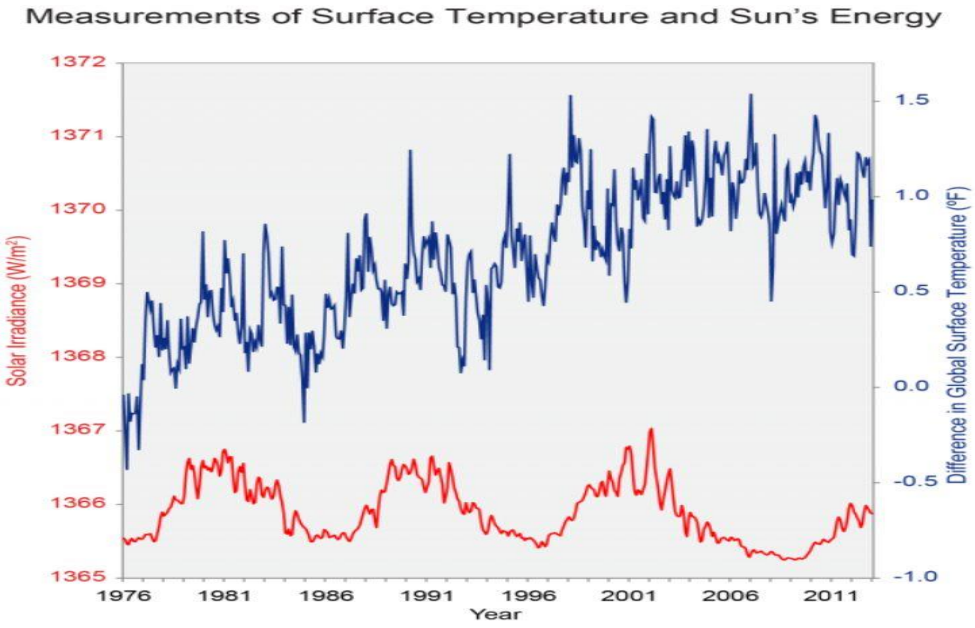
CONCEPTUAL CONNOTATIONS OF GREENING THE ENVIRONMENT:

During the 20th century, the development growth revolved around labor productivity as over the last 200 years labor productivity increased 200 times at the cost of natural resources. The agenda of Green Growth is goal oriented toward national, regional and global policies. Green Growth required three key targets to be achieved by 2050:

a) An inclusive and competitive economy
b) A high standard of living
c) A reduction of natural resources consumption within global environmental limits (Institute, 2013, pp. 22-23).

Currently, on average humanity is extracting 70 billion tons of virgin materials each year which is almost 80% more than what was extracted 30 years ago, putting immense pressure on ecosystems and the environment. Although relative decoupling at global level achieved 40% more economic value each ton of raw material however the efficiency gains during same period undermined by 150%, out of the 70 billion tons of extracted materials every year 50 billion tones is consumed by high income countries (Institute, 2013, pp. 23-38). Ecological rucksacks of high-income countries' consumption is becoming heavier as 40 and 55 Kg/day of natural resources on average of European consumer. If including those resources which are extracted from nature but not used in the eco-system, it goes up to around 60-80 kg/day. This situation requires doubling the parity of the developing and developed world at least[4]. The three fundamental concepts of green development are that economic growth can be decoupled from GHG emissions and environmental degradation, the process of growing green cam itself be a green growth and that going green is the part of the virtuous circle that can ideally coincide with growth (Institute, 2013, p. 23)

Figure 2: Measurements of Surface Temperature

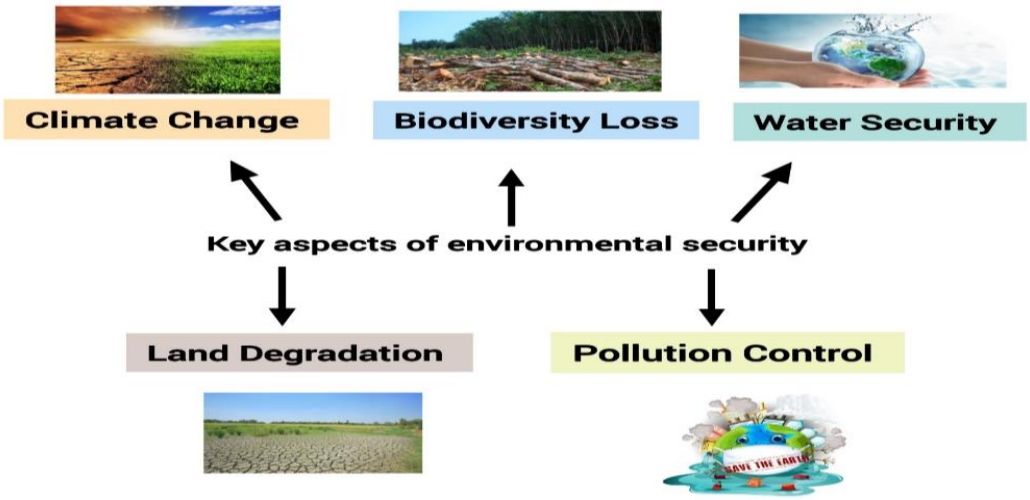


Source: (Agency, 2017)

ENVIRONMENTAL SECURITY:

Environmental security refers to the protection of natural resources and the environment from potential threats and risks, both natural and human-induced. It involves the prevention and management of environmental issues that can have significant impacts on human societies, ecosystems, and economic activities. Key aspects of environmental security include:

Figure 3: Key aspects of environmental security



i) **Climate Change**: It addresses the challenges posed by climate change, such as rising temperatures, extreme weather events, sea-level rise, and disruptions to ecosystems.

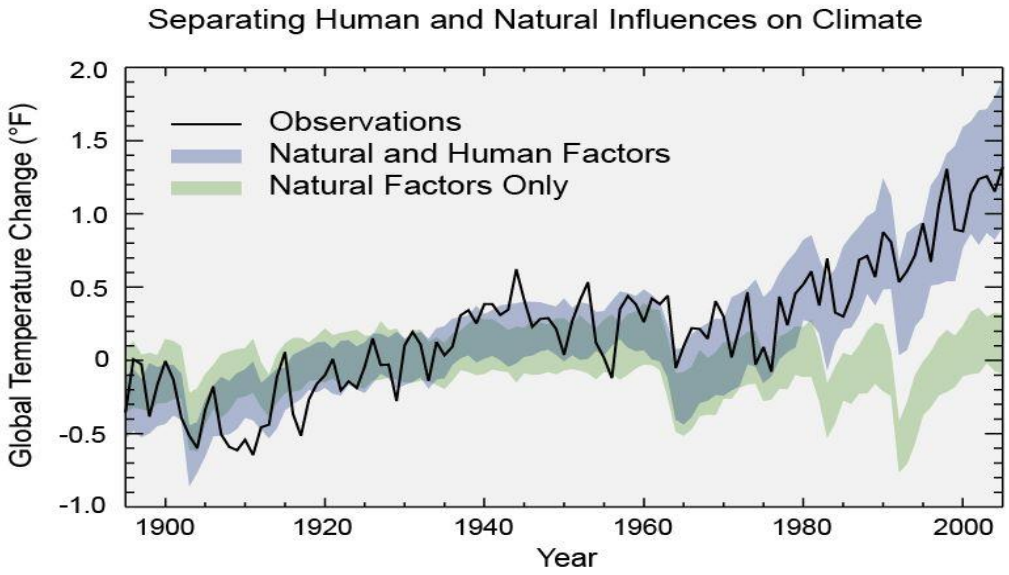
ii) **Biodiversity Loss**: Protecting biodiversity and preventing the loss of species and habitats due to factors like habitat destruction, pollution, and overexploitation.

iii) **Water Security**: Ensuring access to clean and safe water for human consumption, agriculture, and industry, while also protecting water ecosystems.

iv) **Land Degradation**: Combating soil erosion, desertification, and deforestation to maintain fertile land for agriculture and prevent land degradation.

v) **Pollution Control**: Controlling pollution from various sources, including air pollution, water pollution, and waste management.

Figure 4: Separating Human and Natural Influences on climate



Source: (Agency, 2017)

GREEN ECONOMY:

According to the United Nation's Environment Program, Green Economy Initiative means "an economy which results in social equity and improved human wellbeing while significantly reducing environmental risks and ecological sacrifices". This concept encompasses encouraging policies with sensitivity to renewable energy, clean technologies, energy efficient buildings, public transport, waste management of land, water, forest, fisheries, and eco-tourism (Institute, 2013, p. 30).

GREEN INDUSTRY:

Green Industry Initiative was launched by UNIDO which can be considered as sector strategy to achieve green economy. Green Industry is defined as "industrial production and development that does not come at the expense of the health of natural systems or lead to adverse human health outcomes". Cleaner production focuses on process innovation that helps to render production of goods more efficiently. Eco-innovation has a wider notion and includes development of new products, new business, new behavior consumers and new policy instruments and frameworks (Institute, 2013, pp. 31-42).

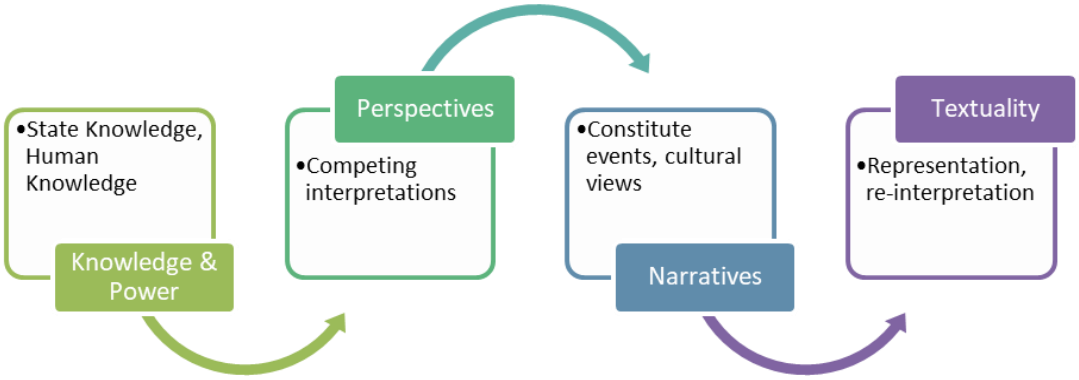
ENVIRONMENTAL SECURITY AND REGIONAL INTEGRATION:

The world is grappling with a myriad of intense issues in which environmental security now qualifies to be the topmost agenda of every government and international organization. The issue of environment was contextualized within security during the later part of the twentieth century. The intellectual, philosophical and theoretical movements of the twentieth century evolved the scientific patterns of research in society. The positivist approach in research and knowledge stringently limited the qualification of truth on the scientifically empirical tests in social sciences too. The major intellectual movement implicating knowledge acquisition was the Critical Theory.

Critical Theory came to be used as the emblem of philosophy questioning the modern social and political life through a method of immanent critique. The intellectual movement is based on the critical and emancipatory potential that had been overrun by the social, political, cultural, economic and technical trends. The Critical Theory takes society itself as the object of analysis prescribing the self-reflective methods. It includes an account of its own genesis and application in society. According to Richard Ashley, "Knowledge is always constituted in reflection of interest". Although critical theory believes in the positivist basis of acquiring knowledge but rejects the claim that object and subject, fact and reality are different. Critical theory seeks to promote greater theoretical reflexivity. Ethics should not be conceived as separate from theories and practices of research and analysis but should be seen embedded in them. Critical theories follow hermeneutics and ideology critique in which structures are socially constructed (Devetak, Critical Theory, 2022, pp. 163-172).

The major shift in the knowledge philosophy is Post positivism or Post modernism which included the perspectives and interpretations as the precinct to actual reality and absolute truths. Power and knowledge are mutually supportive. Michael Foucault, the proponent of Post positivism, asserts that the rule of immanence applies between the knowledge of state and knowledge of man. According to this intellectual approach no truth is absolute, and all knowledge is situated in a particular time and place and issues are to be analyzed from the perspective. These perspectives offer different views of same world. These are perspectives, interpretations, interpretations of interpretations and textuality giving credence to some issue. Narrative is central to every event constituting the event not just understanding that event. Representation of any issue or event is susceptible to competing interpretations (Devetak, Post Postivism, 2002, pp. 185-187).

Figure 5: Post-Positivism Framework



These intellectual and philosophical movements transformed all disciplines and patterns of knowledge acquisition implicating the human development deeply. The technological, industrial and economic development and the globalization knitted the world in a singular

outline of development and underdevelopment. The economic liberalization, free trade, complex interdependence, increasing role of non-state actors through economic clout and privatization of land and resources and its commitment of Liberalism to democratization (Jahn, 2013, p. 52) posed the world with a new range of social, political, cultural and economic opportunities and challenges.

The regionalism and regional economic integration took its roots from the liberalized global economy and prospects of interdependent development paving the way for regional development, productivity convergence and resources sharing. The regional economic integration propagates enhanced economic linkages among the countries of a region aimed at reducing the regional income gap. At the regional level the transfer of technology, migration of labor and sharing of resources for joint project developments have proved to be strong growth drivers and encourage inclusive growth (Ishaq, 2020, pp. 24-25). Intra-industry trade across borders in parts and components and foreign direct investment conducted by corporations and encouraged by considerable liberalization are the mandatory prerequisites of regional integration and cross border trade connectivity. These drivers of regional integration have proved to be significant ingredients of shared productivity and growth in East Asian regional integration (Ishaq, 2020, pp. 24-25).

Figure 6: Regional Economic Integration

The fundamental quest of states and nations remains always the attainment and pursuit of security. Economic liberalization and regional economic integration are also the recipes of security through cooperation. With the conceptual transformations the connotation of security also evolved incorporating economic security, environmental security, energy security and human security. The dominant theorization of security shifted from the traditional comprehension and included broader contours and meaning of security especially after the Cold War. Earlier the onus of defining and determining the security of nation was on the state which now was ascended and descended vertically to include the levels of individual and international securities (Buzan, 1983, pp. 18-19). The issue of environmental security absolutely qualifies this criterion where the fundamental unit of analysis is individual and their security concern elevates to be the national and international levels requiring international response as the nature of the issue is fundamentally transnational. The inclusion and emphasis on environmental security gave way to the development of a complete and separate theoretical model for environmental development and green economic growth. The rapid industrialization, huge economic growth and trade liberalization have immensely benefitted the world but posed biggest threats to the environment. The Green Theoretical development and Green Movements, the Green Politics developed resultantly. It criticizes the economic development on the grounds that structural incentives of actors and operations in relations to open access of resources led to over-use and abuse impeding the collective efforts to mitigate hat abuse. At this point comes

the issue of "Environmental Security" which is a collective action problem. The greens require harmony with nature and strict limits to growth and economic development. They suggest environmental communities. Some bio environmentalists have reached the stage of bio regionalization which focuses on the spatial character of environmental problems. The spatial character of ecosystems should determine the spatial scale of social, political and economic activity. It requires the approach of thinking globally and act locally. More environmental support at local level, self-reliance and smallness of feedback (Patterson, 2002, p. 262 & 271). Green political development is based on the competing forces between egocentrism and anthropocentricism (Carter, 2007, p. 13). Eco centrists propagate the total concentration on nature and preservation of environment. However, the anthropocentricism puts all focus on the human development leaving any concern with the environment. The sustainable development is the intervening concept which joins the diverging poles of anthropocentricism and egocentrism and aligns the concept of economic development with environmental protection. According to Brundtland Report 'Sustainable development is the development that meets the need of the present without compromising the ability of future generations to meet their own needs' (Carter, 2007, p. 211). The dimension of sustainability brings an aspect of physical constraints on development which otherwise directly puts pressure on ecosystems. Sustainable development involves the process of change in which the resource utilization, investment, technologies, institutions and consumption patterns are engaged in harmony with ecosystems 'Sustainable development is the development that meets the need of the present without compromising the ability of future generations to meet their own needs' (Carter, 2007, p. 212).

CAREC COUNTRIES, ENVIRONMENTAL SECURITY AND REGIONAL ENVIRONMENTAL INTEGRATION:

The Central Asian Republics, Caucuses, China, Pakistan, and Russia are adjacent states with huge potential of economic development with abundant resources. These states, although span through different regions, yet having a natural tendency of economic integration and connectivity form a unique inter-regional platform. The Belt and Road Initiative led by China has given a new life to the vision of integration and connectivity. During the last decade the development of BRI routes and corridors through these countries usher into a new era of resource sharing and productivity convergence. China has aligned the BRI with environmental standards introducing the vision of Green BRI. The eleven countries forming the CAREC, face huge environmental threats too. All these countries are rich in water resources, energy resources, agricultural potential, demography and economic potential in addition to being the gateway to Asia. Through the development of an environmental framework through a regional environmental integration idea the region can establish an environmental corridor setting its own standards of sustainable development with an enhanced pace of inclusive growth and shared productivity.

Table 1: Renewable energy Potential of CAREC Countries

Country	Solar Power Potential (GW)	Wind Power Potential (GW)	Hydro Power Potential (GW)	Target for Renewable Energy Generation (% by 2025)
Pakistan	100	50	20	30
China	550	1500	400	20
Russia	100	50	220	35
Central Asian Republics	1980	500	15	30

Armenia	1	250	250	20
Azerbaijan	100	50	40	15
Georgia	100	50	40	25

Source: Generated by authors.

The region has a unique mix of location enabling it historically to proven connectivity and trade, abundance of water resources which have cradles civilizations, and have huge natural resources of geopolitical and geo-economics significance. The Russian-Ukraine war has considerable manifested the global reliance on Russian gas and trade of food through this region. However, these countries face immense challenges of environmental security. A few measures of environmental collaboration can convert this entire region into an environmental corridor enabling drastic greening of trade and connectivity. BRI has already connected all these countries through roads, railroads, economic zones, and ports ushering into humongous economic activities. The potential of integrated water governance among these countries through mutual funding and knowledge and expertise sharing can revolutionize the water scarcity problems of Pakistan and CARS. Furthermore, the development of hydropower can turn the entire region towards clean energy. Similarly, collaborative agriculture development and trade can transform the region into food secure corridor. The potential of the region can be converted into the source of regional energy security.

ENVIRONMENTAL SECURITY ISSUES AND OPPORTUNITIES FOR CAREC COUNTRIES:

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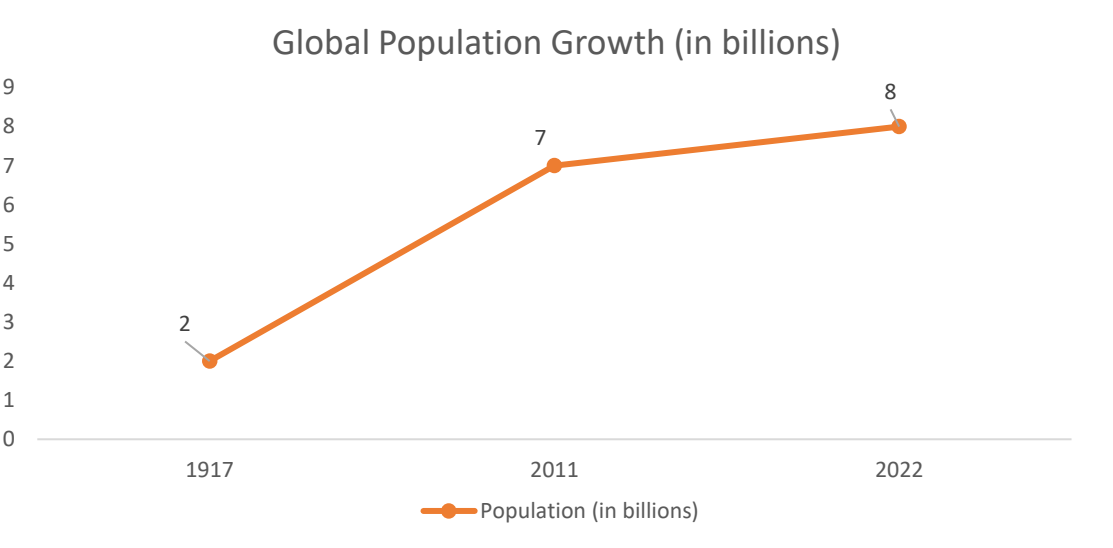
Climate Change has manifested devastating implications with the advent of the 21st century which is augmenting with every passing decade. The 20th century has been a landmark in human history as it achieved unprecedented industrial and technological development at an unanticipated pace. The intellectual development and pursuit introduced the world to globalized interdependence. With the influx of neo-liberal economy during the second half of the 20th century the world enunciated the impacts in the form of complex interdependence. The triumph of Western Capitalism over Communism created a powerful, rich, economically and technologically advanced “core”, and the more so dependent, developing and the underdeveloped, economically and technologically “peripheries”. As the pattern of resources and wealth flight from colonies to imperialist powers dominated from the sixteenth to twentieth century the shift of wealth continues till date from the Global South to the Global North, according to an estimate the North earns USD 2.3 trillion annually from the underdeveloped and poor Global South (International Security by Michael Sheehan). In 2022, the world has hit another milestone, of 8 billion of the population which was certainly not sought after. Yet it is

another wake-up call for an already overburdened and exhausted planet. In 1917, the global population was 2 billion which swelled to 7 billion in 2011 (Niaz, 2023, p. 8).

Figure 7: Global Population Growth (in billion)



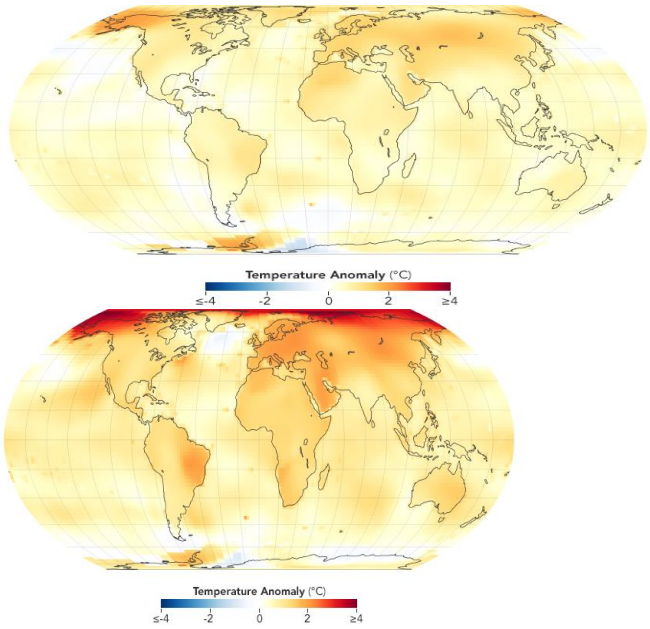
Pakistan contributes less than 1% of Global Greenhouse Gas Emissions. The per capita consumption of resources is so low that with this standard of living it would take a population of 16 billion to exceed Earth's carrying capacity. Pakistan's geography and arid climate put it at risk among the top ten most affected countries by Climate Change. Ilhan Niaz considers Climate Change in South Asia is being considered the biggest regional stability challenge as both Pakistan and India are highly vulnerable to its impacts. However, GDPs are calculated without factoring real environmental cost (Niaz, 2023, p. 9). The concepts of security and national security revolved around traditional defense further augmented by nuclear security. However, as the neoliberal economic development and globalization unleashed a myriad of security and conflict issues, environment, water, energy, and food elevated to get attention and intellectual consideration under the umbrella of security. The world has reached to the point where the Anthropocene Geopolitics has been unleashed (Niaz, 2023, p. 65).

Looking at the world living in 2023 the foremost issue dominantly in every part of the planet remains to be the environment directly or indirectly. Though the wars and conflicts are still the foremost concern but with every such instance the already pressing issue of environment and climate multiply assuming varied forms, such as food crisis, water scarcity, related pollution etc. The highlighting feature is the three years long pandemics jolting the entire world. During the year 2022, global inflation hit 9% which was highest since 2008. During the same year about 95 million people were pushed into poverty. When all the countries signed into UN Biodiversity Agreement vowing to conserve 30% of the world's land and water by 2030, global demand for renewable energy jumped by 8%. The Russia-Ukraine war rippled the energy crisis immediately in Europe with the cutting of natural gas pipeline reducing 45% of its total gas supply. The energy prices in Europe surged by 41.5% in entire Europe this year. Europe's response was to shift to other sources like nuclear, coal and securing more Liquified Natural Gas. In 2022, European Union's investment in renewable energy increased from 40% to 45%. Outside the EU, the largest expanding economies like China and India continue to invest in renewable energy. Only in Amazon forests, which support 10% of global biodiversity, there is 18% deforestation now. This brief overview of the global energy and economy landscape is

enough to highlight the immense amount of investment required for the de-carbonization of the global environment. According to the estimates of the World Economic Forum, people will require USD 5.2 trillion by 2030 but this was just USD 600 billion in 2020 (Parsons, 2023).

World Economic Forum's Global Risk Assessment Report of 2023 categorizes the "Cost-of-Living" crisis as the gravest issues of all during next decade in the wake of geopolitical and economic downturn. It marks the coming decade with environmental and societal crises. Biodiversity and ecosystem collapse is the fastest deteriorating global risks as all six environmental risks hold a place in 10 major risks to the world during the next decade (World Economic Forum, 2023, p. 7).

Figure 8: Global Temperature Variations 2000-2004 Figure 9**: Global Temperature Variations 2015-2019**



Source: (NASA, 2019) Source: (NASA, 2019)

Climate Change is the "tragedy of commons". The Framework Convention on Climate Change, the Conference of Parties" in 1974 was signed by 180 countries. In the Conference of Parties 3, Kyoto Protocol, industrialized countries vowed to reduce collective emissions to roughly 5% below 1990 level by 2008-2012. The United States withdrew from the treaty in 2001 but was ratified sufficiently by others and took effect in 2005. The climate policies are assessed on four levels:

1. Positions taken in international negotiations.
2. Ratification or non-ratification of international treaties.
3. Adoption of domestic programs to abate Climate Change.
4. Street-level implementations of those programs.

However, environmental policies are victims of the perspectives of policymakers, self-interest, ideas and political institutions (Sundstorm, 2010, p. 5). Asia is at high risk of natural disasters. It has already been experienced since the start of the twenty-first century and is continue facing such threats at high level. From 1980 to 2009, it accounted for 45% of global disasters, 42% of

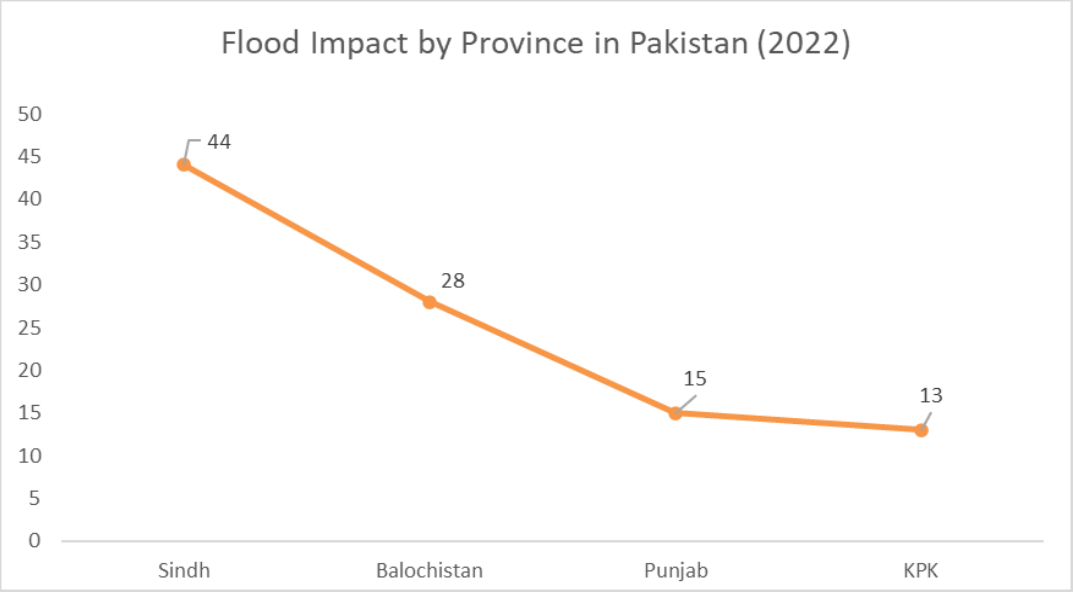
economic losses linked to these disasters, and 86% of deaths. In 2011, the economic losses and damages related to disasters in Asia-Pacific accounted to be USD 267 billion (UNESCAP, 2012, p. 6).

PAKISTAN:

According to Pakistan Meteorological Department from 1950 to 2000, Pakistan's annual mean surface temperature increased overall. In the hyper-arid plains, arid coastal areas and mountain ranges 0.6 to 1.0 degrees Celsius increase was estimated while in central Pakistan 0.9 degrees Celsius increase was noted (Anjum, 2005, pp. 11-21). Pakistan's projected average of temperature increase was estimated to be higher than the world and expected increase in higher parts was more than the lower parts. Water availability has been projected to decrease at an alarming rate while the wheat and rice crops' yield projection also indicated a decrease. The rainfall pattern was projected that it would increase in Upper Indus Plain while decreasing in Lower Indus Plain (Suphachalasai, 2014, p. 113). Since 2000, 14 out of 21 extreme climate-related events have taken place in Pakistan (Nanditha J. S, 2023, p. 7).

Since its inception until 2010, Pakistan has suffered a cumulative loss of USD 30 billion, 8,887 people died and 109,822 villages were reportedly damaged by floods. The major causes of floods in Pakistan are heavy concentrated rainfall in river catchment areas which are sometimes augmented by snowmelt, generally every year. The losses are majorly incurred when the areas around riverbanks are inundated by damaging irrigation and communication facilities across or adjacent to rivers. Along the riverbanks, the soil is eroded which also leads to the overflowing of water. In the upper parts of the Indus Riverbanks water inundating areas flows back to rivers. In lower parts of the Indus Plain it flows at higher elevations than adjoining areas and water does not flow back to river. Embankments are when broken along cause heavy water losses. There are huge structural challenges also as the existing discharge capacity of some important structures like barrages and rail and road bridges is inadequate on Rivers Chenab, Indus and Ravi which becomes the major reason for flooding. The unplanned settlements of villages encroaching upon riverine areas cause huge losses of life, agriculture and settlements. This happens when there is no proper regulatory framework regarding riverine areas. Another phenomenon is of encroachments on riverbanks beyond safe limits of riverine areas for cattle farming. In the recent years the managerial crises have also led to excessive urban flooding (Federal Flood Commission, 2010, pp. 5-10). During 2022, Pakistan experienced the worst flooding of its history affecting almost 33 million people, injuri6yng 13,000 and killing more than 1,600. More than one third of the country was inundated which was far more than 2010, with a loss of about USD 30 billion. During the summers of 2022, the southern provinces of Pakistan received 350% more than usual rainfall (Nanditha J. S, 2023, p. 1). Pakistan cut its annual economic growth for its fiscal year, June 2023. The largest affected population was of Sindh i-e, 44%, then Balochistan 28%, Punjab 15% and KPK 13%. More than 50% of livestock in Balochistan and 32% in Sindh were affected. Total damaged homes were 2 million out of which 88% were in Sindh. In Sindh, 64% of roads were destroyed and 27% in KPK. United Nations estimated that 7.6 million people were displaced on which it issued Flash Humanitarian Appeal on August 30th of USD 60 million (K. Alan Kranstadt, 2022, pp. 1-3). Due to intense heatwaves, there were seven summer glacial lake outbursts in upper Indus Plain (Nanditha J. S, 2023, p. 3). The current account deficit for the FY 2022 reached 4.4% and the fiscal deficit (excluding grants) reached 7.9% (Ministry of Planning, Development and Special Initiatives, 2022, p. 38).

Figure 10: Pakistani Population Affected by Floods in 2022



CHINA:

China is the largest country by population in the world but has fourth largest freshwater reserves in the world with a volume of 2,800 cubic kilometers and 23,000 cubic meters per capita availability of freshwater reserves (Chernikov & Kudryatsev, 2023, p. 383). China' s water problem lies in the geography of its water reserves as the southern part is water abundant, but the north China is water scarce. The twentieth century is marked by the rise and development of just 20% of the global population with high fossil fuel and resource consumption. Now the remaining 80% are seeking and striving to rise. By 2050 the global population will rise over 9 billion and the environmental cost will be insurmountable. China's 12th Five Year Plan in 2013 focused majorly on environmental protection with the undertakings of green transformation of traditional sectors, expansion of emerging green industries and expansion of the service sector (The World Bank, 2013, pp. 236-238). Green development in rising economies is fundamental to the further development of industries and technology. After the pandemic, the world is experiencing supply chain bottlenecks which is also a big challenge. Green technology helps to cue the cost in a bigger way and the cost of this technological development is quite low to invest in sustainability. The supply of key metals for battery production will be less than two-thirds of what will be the demand of 2030 and there is a projected carbon crunch by the start of 2024. The cost of green energy is rapidly falling. The sustainability regulations are becoming more sophisticated with heightened regular scrutiny and eventually the regulatory cost will be much higher. From 2016 to 2018 the volume of Electric vehicles by one of the petrochemical leaders was estimated to increase by 150%. China's aim is to achieve CO2 emissions peak before 2030 and carbon neutrality before 2060 (Carol Liao, 2023, pp. 1-22). The recent staff level Standby Agreement of Pakistan with the International Monetary Fund loudly resonates the economic cost of these damages as along with other structural conditions climate resilience has been made part of the agreement (Sheikh, 2023).

Standing in 2023, it seems impossible to achieve the global ambition to limit the temperature increase to 1.5 degrees as the chances of achieving this target by 2030 break at 50%. Despite the current commitments made by G7 private sectors to limit emissions, the temperature increase can be limited to 2.7 degrees by midcentury. Though the geoeconomic tensions rank third most imminent global risk currently, geopolitical conflicts still have a huge toll on Climate

Change mitigation and adaptation. Recently various countries have restarted coal-powered projects and European Union spent EUR 50 billion on fossil fuel infrastructure. The negotiations at COP 27 failed to reach an agreement over the phased elimination of fossil fuels. At COP 28, despite a plan for a global goal on adaptation, there has been insufficient progress. Global climate financing only allocates 34% for climate adaptation. Only the floods have caused 7% damage to emerging markets and 31% of the loss to advanced economies which has been covered by insurance in last 20 years (World Economic Forum, 2023, pp. 20-23).

RUSSIA:

Russian Federation is the largest country in the world by territory and is the second largest having the most abundant freshwater reserves with the volume of 4,500 cubic kilometers and per capita water availability of 30,500 cubic meters (Chernikov & Kudryatsev, 2023).

The Soviet Union had started the environmental protection agenda by 1956. The Congress of the Communist Party of the Soviet Union passed a resolution to develop productive forces. By resources ministries and the business community remained dominant. By mid 1960s, 78% of industrial enterprises did not have treatment facilities and the air of about 1,750 cities was badly polluted. The Ministry of Environment was downgraded to the State Committee for Environmental Protection in 1996 by President Yeltsin and liquidated in 2000 by President Putin. However, the Doctrine of Environment was introduced in 2002 which was mostly rhetoric. The serious effort started in 2012 with the State Policy in the Field of Environmental Development of the Russian Federation. During the 2010s, Russia gradually entered the contours of a modern global ecosystem with national projects coinciding the Sustainable Development Goals. Still the preventive factor remains the bigger role of business enterprises dominating the state policy. Larger enterprises had a few environmental specialists and while the medium and small enterprises did not have any (Sonovskikh, 2023, p. 200).

During the COP 21 (Conference of Parties), Russia agreed to limit anthropogenic greenhouse gas emissions by 2030 to no more than 70% to 75% compared to the levels in 1990. The year of the environment was 2017 in Russia. The Center for Competencies and Green Expertise was developed in 2019. Russia is the largest country in the world by area and it still has unique natural capital with pristine nature on 65% of its territory unaffected by the economic activities. Russia has shown stable growth driven by the exploitation of its natural capital. The economic cost of environmental degradation, pollution, and poor management of natural resources range from 1% to 6% of GDP. Russia is committed to the agenda of SDGs by 2030 (Sonovskikh, 2023, pp. 170-175).

In 2017, the government developed key indicators of public non-financial reporting. These were i) environmental indicators, ii) economic indicators, iii) social indicators, and iv) management indicators. Environmental taxes were introduced as an important tool of greening the economy. According to Pigou, “negative external cost arises when in a society an economic activity has a negative impact on the environment. The rate of environmental tax should be per unit of pollutant and be equal to the marginal social cost to achieve a balance between the volume of production of taxpayers and losses to society”. Energy taxes, transport taxes and emission taxes are a few examples of taxes introduced. The resource taxes are of two kinds: the earmarked, the proceeds of which are utilized in financing environmental programs like all emission taxes, and the unmarked taxes as they are meant to replenish revenue side being fiscal financing taxes. Their secondary function is to reduce negative impacts on government like energy, transport, and resource taxes. In 2021, a carbon tax could not be achieved again due to the role of entrepreneurs and officials of state who believe that an acceptable level of material security for the population and a favorable environment are incompatible. A huge national

project named as “Ecology” was introduced in 2019 under which vast areas have been marked which play an essential role in conserving natural capital and ensuring environmentally sustainable development. The Environmental Security Strategy is another step in Russian Federation for the period up to 2025 for managing and restoring eco-systems and environmental audits. From 2003-2019, government spending on the environment decreased from 1.3% of GDP to 0.8% of GDP while at least 1.3% off GDP is required to steer toward sustainable development. The other important step in greening the economy is green financing and Russia issued its first green bonds in 2018 which was the first target securities in the Moscow Stock Exchange with the aim of raising funds to construct environmental infrastructure facilities. In 2019, Moscow joined “Sustainable Stock Exchange” which united with 85 exchanges worldwide (Sonovskikh, 2023, pp. 186-198).

CAUCASUS:

Historically and traditionally the Caucasus ecoregion spans over the landmass between Caspian Sea, Black Sea, and Azov Sea, of Azerbaijan, Armenia and Georgia, the Caucasus of Russian Federation and Northeast Turkey being one of the riches biologically yet endangered (World Wide Fund for Natural Life, 2020, pp. 5-6). Politically this is now the three countries of former Soviet Union, Armenia, Azerbaijan, and Georgia.

The Soviet Era industrial base developed to process Caspian Oil which has rendered inappropriate adding to marine pollution. The region flares off gas and heavily depends on oil for electricity production. Though Azerbaijan has most advanced land reforms in all former Soviet states yet still it is grappling with low agricultural yield. Caucasus region is one of the world’s 25 environmental hotspots (on of those biologically richest yet most endangered terrestrial ecosystems in the world). The environmental issues in Azerbaijan are linked to Caspian Sea, with overexploitation of biota/commercial fish species, coastal landscape degradation and transboundary water issues (Asian Development Bank, 2005, pp. ix-xiii). Forests are one fifth of this eco region. Only in the Caspian Sea there are 120 species of fish. Climatic problems, temperature rise, shrinking glaciers, rising sea level, reduction of river flows, coastal erosion, flooding, drought are the major problems. Caucasus requires integrated approach (World Wide Fund for Natural Life, 2020, pp. 17-20).

Table 2**: Risk areas in Caucasus by 2030**

High Risk Areas by 2030	**Medium Risk Areas by 2030**
Black Sea Coast	Lake Sevan
Northwestern Georgia	Yevevan and Ararat Valley
The Kakheti Region	Northwestern Azerbaijan
The Mtskhetam Region	Northeastern Georgia
Tblisi	Alaizain/Ganykh Riverbanks
Kura-Arakas Lowland	Northen Armenia
|Baku and Absheron peninsula	Southern Georgia
Southern Armenia	

Source: Generated by Author (The Environment and Security Initiative, 2020, pp. 6-15)

CENTRAL ASIAN REPUBLICS:

In this region the Aral Sea basin is notable in socio-economic development. Large scale water development has changed the water cycle. This basin is already an arid zone, and the developmental and demographic factors has heavily pressured the climate and natural resources. The overall region is the vast undrained area within the confines of Aral-Caspian

Basin. The major rivers of Central Asia are Syra Darya and Amu Darya which also feed Aral Sea. This basin was stable until 1960s. However, now the deltas of both rivers have almost completely dried up. Glaciers just contribute 10% to the rivers' runoff and seasonal snow upto maximum 50%, the rainfall share is insignificant, usually below 10% and rarely 20% even at the elevations of 1000-2000 meters (Narbayep & Pavolova, 2022, pp. 5-8). The warming up of mountains of Pamirs and Tien Shan, Gissaro-alai and other mountain systems reflect climate trends, the drying up of the Aral Sea, intensification of wind erosion of dried bed surface are a few of the important factors due to the gradual development (Narbayep & Pavolova, 2022, p. 23).

The Soviet Era decision to extend irrigation root to Aral Sea for cotton production proved to be detrimental for this basin which was once the fourth largest lake on Earth. The surface area has declined from 68,000 square kilometers to 14, 280 square kilometers in 2010. Almost 79% of irrigation water is lost or evaporates before reaching the fields. It is estimated that 1% water pumping efficiency in Uzbekistan will lead to USD 10 million of savings (Gasparri, 2018, pp. 3-8).

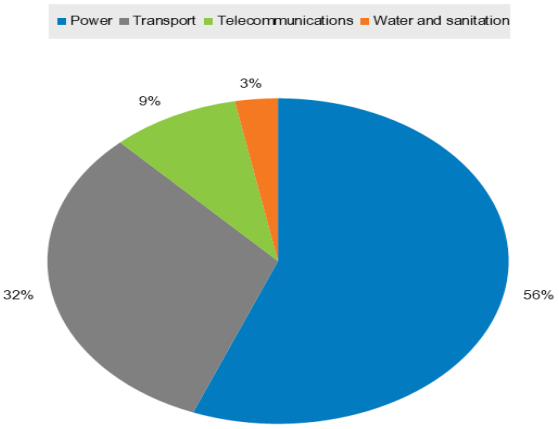
Figure 11: Water Resources of Aral Sea Basin

Source: The Water Resources of Aral Sea Basin, http://www.cawater-info.net/aral/index_e.htm

GREENING THE BRI-A CASE OF REGIONAL ECONOMIC INTEGRATION TO REGIONAL ENVIRONMENTAL INTEGRATION

It was estimated by the Asian Development Bank in 2017 that by 2030, Asia will need USD 26 trillion in infrastructure development which makes that it shall be needing USD 1.7 trillion at least (OECD, 2018, p. 2).

Figure 12: Infrastructure Investment Needs in Asia by Sector



Source: Asian Development Bank, 2017

China's Belt and Road Initiative trekked on filling this gap with proven potential. From 2017 onwards, OECD estimated that BRI could add over USD 1 trillion outward funding for foreign infrastructure until 2017. The highest investment needs were projected to be in South Asia, 8.8% of GDP, and Central Asia i-e, 7.8% of GDP (OECD, 2018, p. 3 & 6). However, the global impact of Climate Change requiring the pledges of all leading nations implicated China too as it is the second largest Greenhouses Gases emissions. The post-pandemic evolution of BRI also incorporated a green vision aiming at achieving low carbon emissions, conserving the eco-environment, protecting biodiversity, and tackling Climate Change. The essence is to integrate green development and ecological and environmental protection. In May 2017, President Xi Jinping proposed to establish International Coalition for Green Development on Belt and Road. The coalition was co-initiated by the United Nations Environment Program and the Ministry of Ecology and Environment of China. The mandate includes the; i) platform for dialogue, ii) knowledge and information platform, iii) platform for Green Technology, iv) thematic partnerships on biodiversity, green energy, green finance and investment, environmental quality, sustainable transportation and Climate governance. Promoting the green development of BRI requires the establishment of an integrated decision-making mechanism for environmental protection and construction of BRI. Greening BRI requires a green industrial chain and value chain, green unimpeded trade, and protection of regional ecological systems (CCICED, 2018, pp. 4-12).

Despite various agreements on the environment, global warming will reach 2.4 degrees Celsius higher than pre industry times during this century far exceeding the Paris Agreement goal of below 2 degrees Celsius. Before and during COP 26 (Conference of Parties, 2021) more than 100 countries agreed to reduce methane emissions by 30%, by 2030. More than 125 of such countries were representing the world's 90% GHG emissions. Green financial instruments, green credit, green bonds, green stocks indices, green financial funds, green insurance, and carbon financing are the few instruments which require to be normalized rapidly. Since the launch of BRI, about 3,800 outbound projects involving contractors, or financing from China was announced with a value of USD 4.3 trillion in transport, power, oil and gas, water, real estate, manufacturing, mining, and communications. China's State-Owned Enterprises were involved in 3,400 of these projects through 2020. Chinese companies are well-placed to facilitate global energy transition. It has installed 36% of the world's total solar photovoltaic capacity and 13.9% of the world's total wind power capacity of new concentrated solar power capacity installed globally during 2018-2020. Out of which one-third is in China. Its

photovoltaic sector provides three fourth of the global production (Insight Group, 2022, pp. 6-10).

LEVERAGING GLOBAL DEVELOPMENT INITIATIVE:

The Global Development Initiative (GDI) proposed at the 76th Session of the United Nations (UN) General Assembly, is a people-centered initiative that primarily focuses on the international commitment to development as a priority, with an innovation-driven development agenda and results-oriented actions. The GDI prioritizes cooperation in eight areas:

a. Poverty Alleviation,
b. Food Security,
c. Pandemic response and vaccines,
d. Financing for development,
e. Climate Change
f. Green development,
g. Industrialization,
h. Digital Economy,
i. Connectivity in the digital era.

Focusing on the issue of equitable development, the GDI aims to accelerate the implementation of the 2030 Agenda and works into the vulnerabilities of different regions and countries to climate change impacts. Areas with lower development indicators might be less equipped to deal with the effects of climate change, making them a priority for targeted interventions. Climate change is closely linked to unsustainable development practices (Wen, H., Liang, W., & Lee, C. C., 2023). By integrating environmental indicators into development indices, policymakers can incentivize sustainable practices and GDI is an important public good and cooperation platform proposed by the Chinese government for the whole world. Upholding the principles of openness, transparency and inclusiveness, GDI is an important platform proposed to ensure openness, transparency and inclusiveness. The initiative also sets a positive example of cooperation and promotes other nations' and organizations' involvement with UN development for fostering involvement and cooperation. In GDI, China has joined with several developed countries and international organizations to increase resources for global development through its constructive participation in the replenishment of multilateral institutions. This provides a suitable platform to combat Climate change-related concerns and foster joint partnerships wherein, China has signed 46 South-South cooperation documents on climate change with 39 developing countries, to help them improve their climate response capacity through cooperation in building low carbon demonstration zones and implementing assistance programs. China has also carried out training programs on climate change capacity building (outcomes of China's Implementation of the Global Development Initiative-2022).

The Global Development Initiative gives the 2030 Agenda new life by reviving the global development partnership, mobilizing resources from around the world, fostering closer development cooperation, closing the North-South divide, and pursuing stronger, greener, and healthier global development. By reactivating international cooperation on development, forging an international consensus to advance development, and repositioning development at the top of the international agenda, it first makes the clear call for shared development.

REGIONAL ENVIRONMENTAL INTEGRATION FRAMEWORK-CAREC

Climate Change has manifested devastating implications with the advent of the 21st century which is augmenting with every passing decade. The 20th century has been a landmark in human history as it achieved unprecedented industrial and technological development at an

unanticipated pace. The intellectual development and pursuit introduced the world to globalized interdependence. With the influx of neo liberal economy during the second half of the 20th century the world enunciated the impacts in the form of complexed interdependence. The triumph of Western Capitalism over Communism created a powerful, rich, economically and technologically advanced "core", and the more so dependent, developing and the underdeveloped, economically and technologically "peripheries". As the pattern of resources and wealth flight from colonies to imperialist powers dominated from sixteenth to twentieth century the shift of wealth continues till date from the Global South to the Global North, according to an estimate the North earns USD 2.3 trillion annually from the underdeveloped and poor Global South. In 2022, the world has hit another milestone, of 8 billion of population which was certainly not sought after. Yet it is another wake-up call for an already overburdened and exhausted planet.

Looking at the world living in 2023, the foremost issue dominantly in every part of the planet remains to be the environment directly or indirectly. Though wars and conflicts are still the foremost concern but with every such instance the already pressing issue of environment and climate multiply assuming varied forms, such as food crisis, water scarcity, related pollution etc. The highlighting feature is the three years long pandemics jolting the entire world. During the year 2022, global inflation hit 9% which was the highest since 2008. During the same year about 95 million people were pushed into poverty. When all the countries signed into UN Biodiversity Agreement vowing to conserve 30% of the world's land and water by 2030, global demand for renewable energy jumped by 8%. The Russia-Ukraine war rippled the energy crisis immediately in Europe with the cutting of natural gas pipeline reducing 45% of its total gas supply. The energy prices in Europe surged by 41.5% in entire Europe this year. Europe's response was to shift to other sources like nuclear, coal and securing more Liquified Natural Gas. In 2022, European Union's investment in renewable energy increased from 40% to 45%. Outside EU, the largest expanding economies like China and India continue to invest in renewable energy. Only in Amazon forests, which support 10% of global biodiversity, there is 18% deforestation now. This brief overview of the global energy and economy landscape is enough to highlight the immense amount of investment required for the decarbonization of the global environment. According to the estimates of the World Economic Forum, people will require USD 5.2 trillion by 2030 but this was just USD 600 billion in 2020 (Parsons, 2023).

World Economic Forum's Global Risk Assessment Report of 2023 categorizes the "Cost-of-Living" crisis as the gravest issues of all during next decade in the wake of geopolitical and economic downturn. It marks the coming decade with environmental and societal crises. Biodiversity and ecosystem collapse is the fastest deteriorating global risks as all six of environmental risks hold place in 10 major risks to the world during next decade (World Economic Forum, 2023, p. 7). However, the environmental policies are victims of the perspectives of policy makers, self-interest, ideas and political institutions (Sundstorm, 2010, p. 10).

REGIONAL ENVIRONMENTAL INTEGRATION: Regional environmental integration involves collaboration and cooperation among neighboring countries to address environmental challenges that have trans-boundary implications. It emphasizes the interconnectedness of environmental issues and the need for joint efforts to achieve effective and sustainable solutions. This can lead to Collaborating on shared environmental issues that cross national borders, such as river basin management, air quality, and protected areas aligning environmental policies and regulations among neighboring countries to create a cohesive and coordinated approach to environmental management and this can be achieved through:

a. **Capacity building and Information Sharing**: Sharing data, knowledge, and best practices on environmental issues to enhance understanding and foster joint problem-solving.
b. **Joint Environmental Projects**: Implementing projects that involve multiple countries working together to address regional environmental challenges, such as cross-border conservation areas or renewable energy initiatives.
c. **Disaster Preparedness and Response**: Collaborating on disaster preparedness and response measures to address environmental emergencies that may affect multiple countries.

I) **REGIONAL INTEGRATION INITIATIVES FOR DISASTER CONTROL**: Regional integration initiatives for disaster control aim to foster collaboration and coordination among neighboring countries to enhance preparedness, response, and recovery efforts in the face of natural or man-made disasters. Regional integration initiatives for disaster control require strong political commitment, sustained funding, and active participation from all member countries. Regional organizations and forums play an essential role in facilitating dialogue and cooperation among nations, ensuring a collective response to disaster challenges in the region. These initiatives recognize that disasters often transcend national borders and require joint efforts to address them effectively. Below are some key regional integration initiatives for disaster control:

II) **REGIONAL DISASTER RESPONSE MECHANISMS**: Establishing regional disaster response mechanisms allows countries to pool resources, expertise, and capacities to respond rapidly and effectively to emergencies. These mechanisms may include mutual aid agreements, standardized procedures for requesting and providing assistance, and joint disaster response drills and exercises. Implementing regional early warning systems for various types of disasters, such as tsunamis, cyclones, floods, and wildfires, can help countries share critical information in real-time and alert potentially affected areas across the region. Early warning systems improve evacuation procedures and save lives.

III) **INFORMATION SHARING AND CAPACITY BUILDING**: Creating communication networks and platforms for information sharing among neighboring countries facilitates the exchange of data, lessons learned, and best practices in disaster management. These networks can enhance situational awareness and foster timely and effective decision-making. Regional initiatives can also provide opportunities for joint capacity-building programs and training sessions on disaster preparedness, response techniques, and post-disaster recovery. Sharing knowledge and expertise helps improve overall disaster management capabilities within the region. Engaging local communities and raising public awareness about disaster risks and preparedness measures are critical components of any regional disaster control initiative. Informed and proactive communities are better equipped to respond to disasters effectively.

IV) **REGIONAL CONTINGENCY PLANNING:** Collaborative development of regional contingency plans ensures that neighboring countries are prepared to address disasters that may affect multiple nations simultaneously. Such plans should include clear roles, responsibilities, and procedures for cross-border coordination during emergencies. Conducting joint risk assessments helps identify shared vulnerabilities and high-risk areas across the region. This information informs disaster preparedness strategies and resource allocation.

V) CROSS-BORDER COOPERATION IN RESCUE AND RELIEF OPERATIONS: Encouraging cross-border cooperation in rescue and relief operations ensures that affected communities receive timely and adequate assistance during and after disasters. This may

involve streamlined customs and immigration procedures for humanitarian assistance and personnel.

VI) REGIONAL RESEARCH AND INNOVATION COLLABORATIONS: Encouraging research and innovation collaborations among regional institutions and experts can lead to the development of new technologies, tools, and strategies for disaster control.

VII) LEGAL AND POLICY FRAMEWORKS: Harmonizing legal and policy frameworks related to disaster management among neighboring countries can facilitate seamless coordination and cooperation during emergencies.

VIII) BRI AND CAREC FOR INTEGRATED DISASTER RELIEF: One of the most enormous geo-economic projects is China's Belt and Road Initiative (BRI). During his trips to Central Asian nations in 2013, Chinese President Xi Jinping came up with the concept. At first, the project originally only included 56 nations, but eventually added additional nations, making it a cross-regional initiative that encompasses 137 countries. As the BRI evolves, there may be opportunities for the participating countries to further explore and develop initiatives explicitly dedicated to integrated disaster relief. Collaboration and dialogue among BRI member countries can help identify specific needs and priorities in this area and foster more coordinated disaster response efforts in the future. In the past 10 years, China's Belt and Road Initiative (BRI) developed a system of interaction with the member countries to uplift economic and environmental integration. Through BRI, these countries are now developing in the field of financial management, energy, and environment. BRI in potentially developing substantial reliance on energy resources, thus increasing their industrial output through an advanced production process. Global warming is another primary concern of the BRI initiative and can be achieved through practical cooperation between the member countries. A substantial amount of research focusing on various environmental issues is being discussed with the partner countries. However, there is insufficient research in the developing countries included in the BRI. This raised the importance to test the nexus between energy, finance, and environment-related constructs to present the empirical significance with policy suggestions. several engagements and approaches could be taken within the context of the BRI to enhance integrated disaster relief efforts:

IX) DISASTER-RESILIENT INFRASTRUCTURE: Countries involved in the BRI can prioritize the construction of disaster-resilient infrastructure, including roads, bridges, ports, and buildings, to ensure they can better withstand natural disasters. Collaborating on regional early warning systems for various types of disasters can help BRI countries share critical information and coordinate response efforts during emergencies.

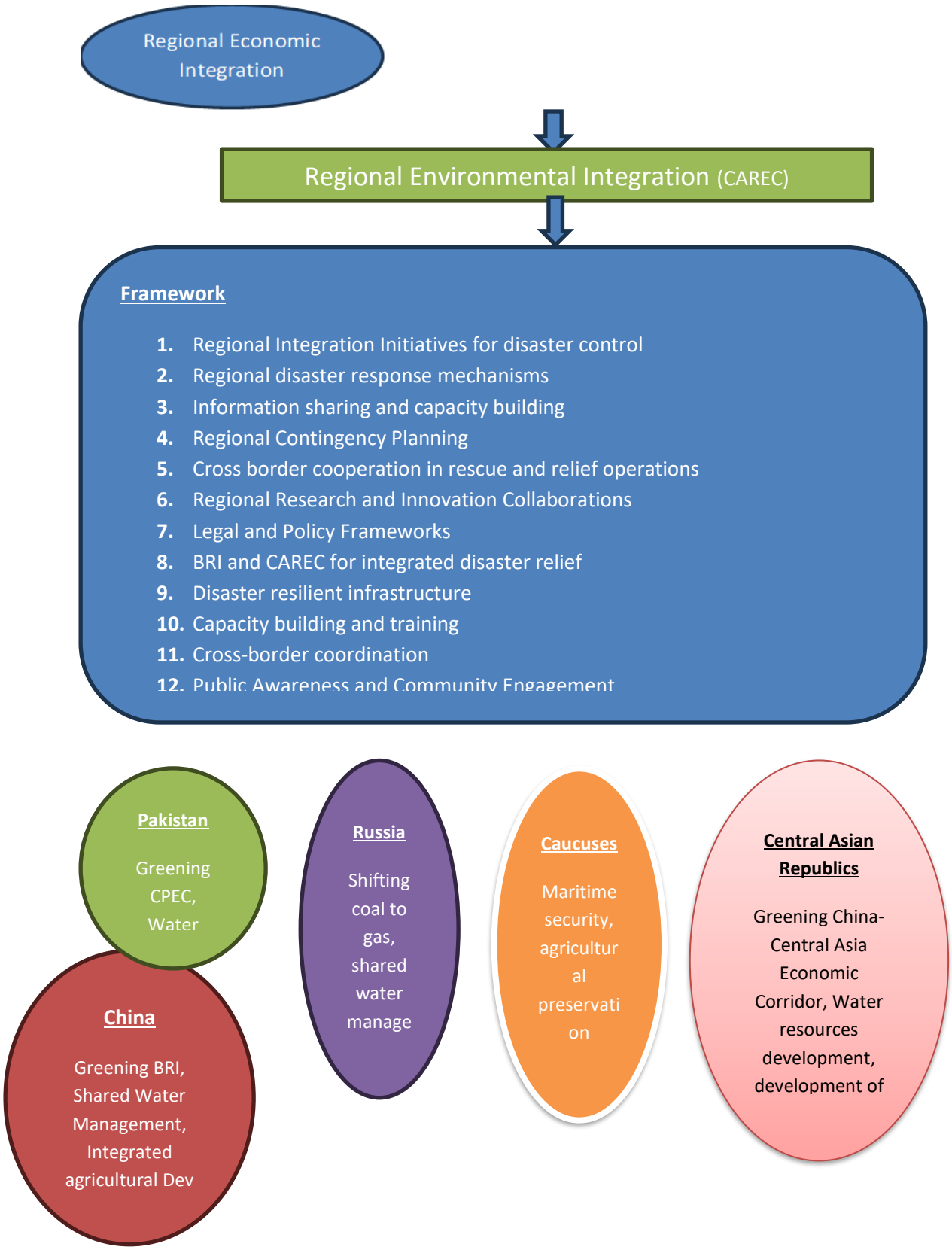
X) CAPACITY BUILDING AND TRAINING: BRI countries can engage in joint capacity-building programs and training sessions on disaster preparedness, response techniques, and post-disaster recovery to strengthen their collective response capabilities.

XI) CROSS-BORDER COORDINATION: Enhancing cross-border coordination mechanisms and protocols can facilitate the efficient movement of relief goods and personnel during disasters that affect multiple BRI countries.

XII) PUBLIC AWARENESS AND COMMUNITY ENGAGEMENT: Encourage public awareness campaigns and community engagement initiatives across BRI countries to educate people about disaster risks and preparedness measures.

While these measures could be integrated into BRI projects, it's important to recognize that disaster relief and resilience are complex challenges that require a multi-stakeholder approach. Governments, international organizations, civil society, and local communities all play critical roles in effective disaster management. In 2017, The Belt and Road Ecological and Environmental Cooperation Plan' was also released by the Chinese government. The underlying philosophy was same to incorporate the agenda of green development in their five objectives of BRI which include financial integration, unimpeded trade, people-to-people bonds, policy coordination and facilities connectivity. China has set up the goal of integrating the concepts of ecological civilization and green development in BRI till 2025 and increasing its efficiency till 2030 to achieve the Sustainable Development Goals. Similarly, accountability and transparency would be ensured to keep a check on the progress of Green Development in BRI. This will help in recognizing that environmental issues often transcend national borders and affect multiple countries in a region. This could include challenges such as climate change, air and water pollution, deforestation, biodiversity loss, and resource depletion. Thus establishing mechanisms for regional cooperation and decision-making to address environmental issues becomes imperative. This could involve the creation of regional environmental organizations, joint agreements, and platforms for dialogue and negotiation among participating countries through harmonizing environmental policies, regulations, and standards across participating countries to create a common framework for environmental protection and sustainable development. This may require negotiations and compromises to accommodate the diverse needs and priorities of different nations and by exploring and implementing financial instruments to support regional environmental initiatives, including funding from international organizations, public-private partnerships, and regional development funds.

Figure 13: Regional Environmental Integration-CAREC Environmental Corridor


Regional Economic Integration
Regional Environmental Integration (CAREC)
Framework
1. Regional Integration Initiatives for disaster control
2. Regional disaster response mechanisms
3. Information sharing and capacity building
4. Regional Contingency Planning
5. Cross border cooperation in rescue and relief operations
6. Regional Research and Innovation Collaborations
7. Legal and Policy Frameworks
8. BRI and CAREC for integrated disaster relief
9. Disaster resilient infrastructure
10. Capacity building and training
11. Cross-border coordination
12. Public Awareness and Community Engagement
Pakistan
Greening CPEC, Water
China
Greening BRI, Shared Water Management, Integrated agricultural Dev
Russia
Shifting coal to gas, shared water manage
Caucuses
Maritime security, agricultural preservation
Central Asian Republics
Greening China-Central Asia Economic Corridor, Water resources development, development of

CONCLUSION

To summarize this paper has presented the model for integration for a dynamic, multi-region, for combating climate change challenges. This requires long-sighted approaches that help to deliver insights and tools that improve policymaking. Environmental concerns have been a part of national economies for decades but now it has elevated to the level of national security agenda as the global response to it has increased manifolds with the ever-increasing manifestation of its implications. The regions of Central Asia and Caucasus, China, Russia, and Pakistan collectively exhibit a huge potential of biodiversity with abundant wealth of natural resources and humongous population. These countries can transform their environmental problems into environmentally integrated corridors with a framework of shared and collaborative design to exploit the environmental potential of these countries and develop a regional corridor. This study developed the base of environmental integration on the regional economic integration. The cost of greening and sustaining green industries is much lower than sustaining the conventional industries. China is already providing 34% of PV technology to the world. The hydro, wind and solar potential of these countries is sufficient to transform the energy mix of these countries. Environmental problems are trans-boundary in nature which require a cooperative approach for environmental governance. The greening of BRI is already a leap in the right direction which can provide a huge opportunity to bring about this change. For this to be achieved for a win win outcome and meaningful analyses, stakeholders need to be integrated since the framing of the research and contribute to future narratives, and researchers need to consider deep uncertainties, feedback loops, and other complex features for inter-regional integration.

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