

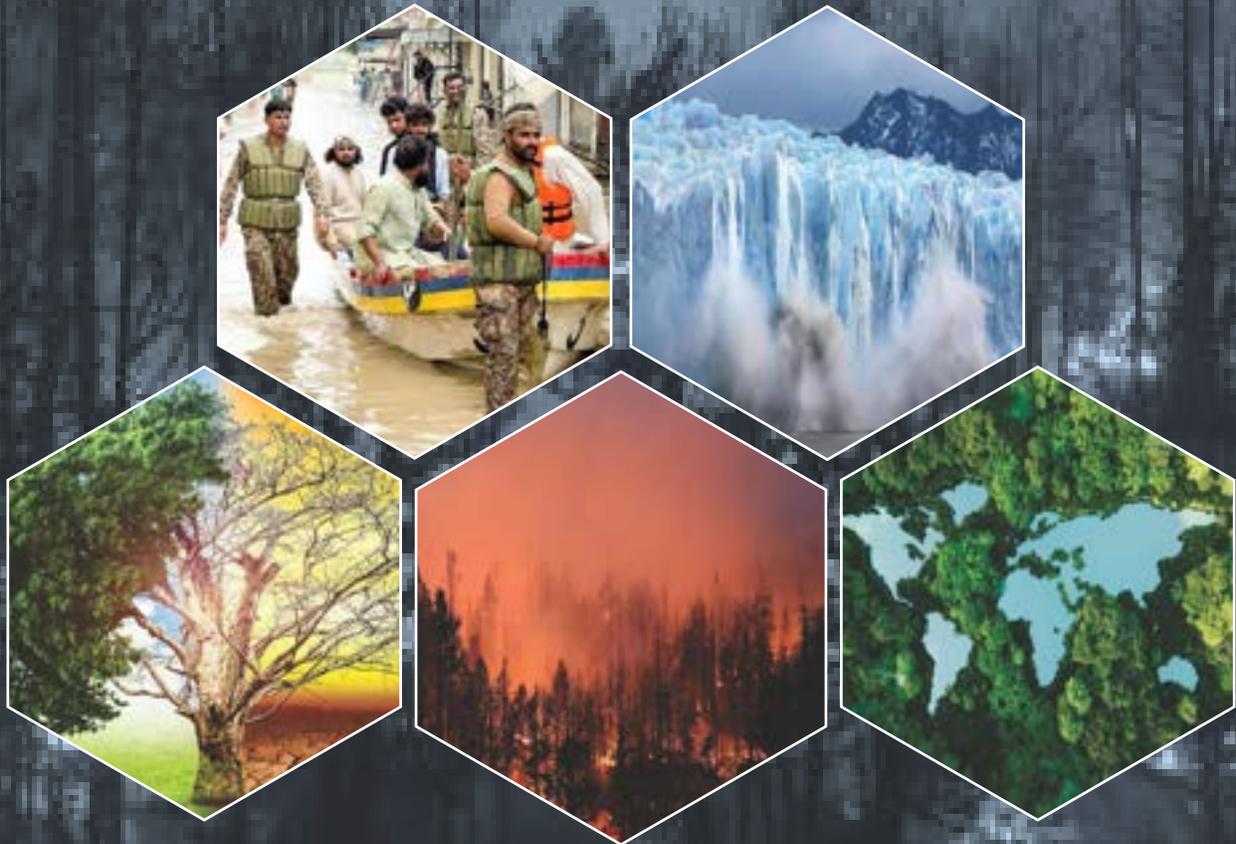


INTERNATIONAL SEMINAR/ROUNDTABLE

# CLIMATE CHANGE

CAUSATIVE FACTORS, IMPACTS ON  
PAKISTAN AND WAY FORWARD

21 December 2022 to 31 January 2023



INSTITUTE FOR STRATEGIC STUDIES, RESEARCH AND ANALYSIS (ISSRA)  
NATIONAL DEFENCE UNIVERSITY-ISLAMABAD

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Post Seminar Report Supervised by

**Brig Masroor Ahmad (Retd), SI (M)**

Director Defence and Strategic Studies Branch

Institute for Strategic Studies, Research and Analysis (ISSRA)

**Edited by**

Ms. Marium Akhtar

Ms. Fatima Saleem

Ms. Aiman Nawaz

Ms. Faiza Qureshi

Mr. Muhammad Nasir Ansari

Mr. Muhammad Gulraiz

Mr. Azam Khan

**Designed by**

Zahid Khattak

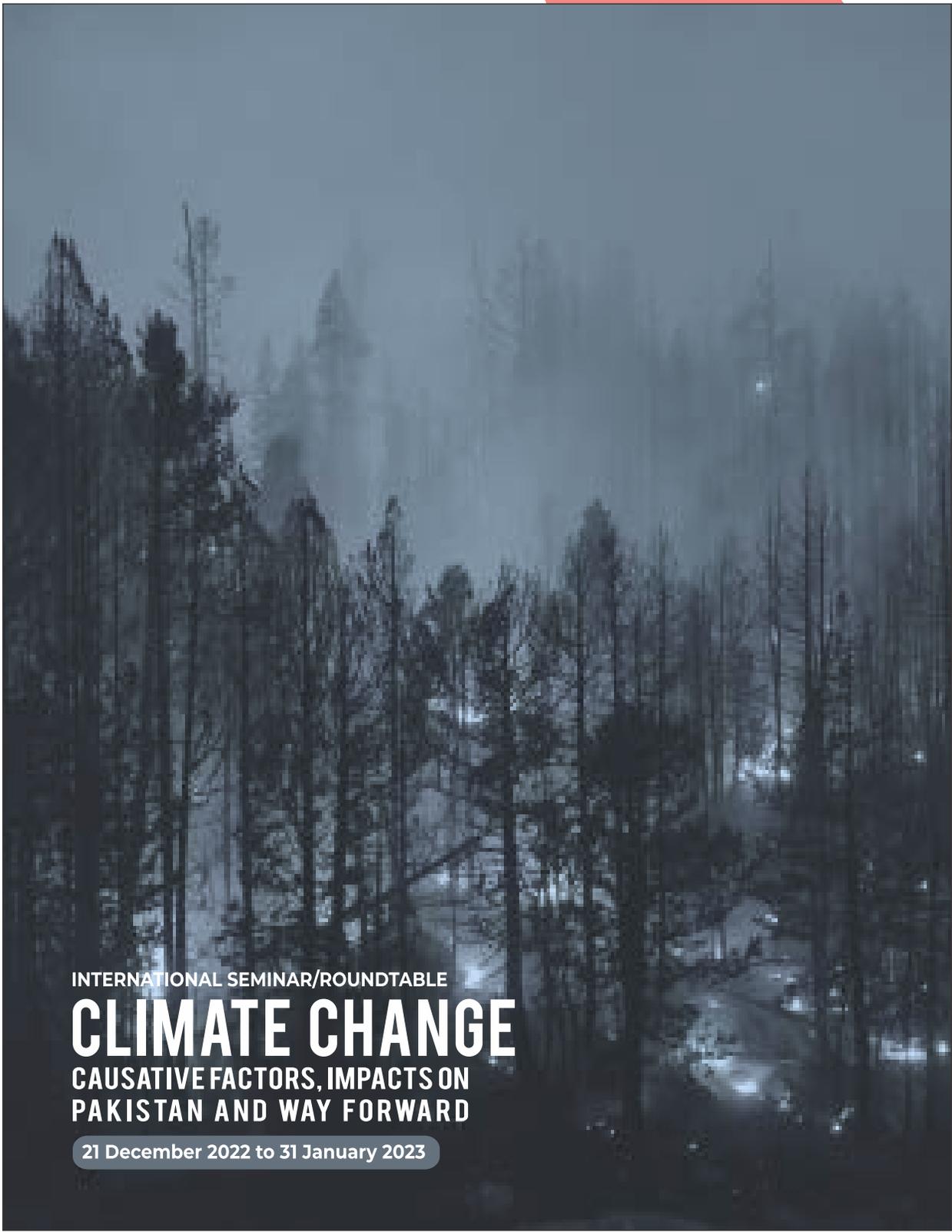
Aftab Mirza

**Publication by**

Defence Studies Branch, Institute for Strategic Studies, Research and Analysis (ISSRA)

National Defence University (NDU), Islamabad-Pakistan

E-mail: [dirdsissra@ndu.edu.pk](mailto:dirdsissra@ndu.edu.pk)



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# Overview of Speakers



## **Senator Sherry Rehman**

is the Federal Minister of Climate Change, Parliamentary Leader of the Pakistan Peoples Party (PPP) in the Senate, as well as the party's Vice President. She is also the Vice President United Nations Environment Agency (UNEA) Bureau, and Chairperson of Pakistan's Taskforce on Global warming and Heat wave. Ms. Rehman has served as Pakistan's Ambassador to the U.S. and Federal Minister for Information and Broadcasting. She has received Pakistan's highest civil award, the Nishan-e-Mtiaz, and is named among "25 Most Influential Women of 2022" by Financial Times



## **Mr Arshad Ayub Khan**

is a Pakistani politician and a member of provincial assembly of Khyber Pakhtunkhwa since 2018. He is an elected legislator from Haripur constituency PK-41 (Haripur-II) as Pakistan Tehreek-e-Insaf member. Currently he is serving as District Development Advisory Committee Chairman (DDAC) of Haripur as well as Provincial Minister for Irrigation Khyber Pakhtunkhwa.



## **Mr. Jam Khan Shoro**

is an elected member of Sindh Assembly, since 2018 from PS-62 (Hyderabad-I). He is a member of standing committee on Finance, standing committee on Information and Archives, standing committee on Local Government, Rural Development, Public Health Engineering and Housing and Town Planning. Currently he is appointed as Irrigation Minister Sindh.



## **Major General Asghar Nawaz (Retired)**

is an accomplished professional with 40 years of diverse management experience in military service, disaster risk management, development domain, project management and power sector. He has served as Chairman National Disaster Risk Management Authority (NDMA) from 2015 – 2017, and Earthquake Reconstruction and Rehabilitation Authority (ERRA) from 2016 – 2017. He has represented Pakistan's Delegation at UN's 3rd World Conference on Disaster Risk Reduction 2015 and Pakistan's Delegation as a Negotiator on Loss & Damage at COP-21 and COP-22. He is considered an authority on climate change and DRR in Pakistan



**Deborah Ramalope**

is the head of Climate Policy Analysis team and serves on Climate Analytics' executive team. She holds expertise in climate policies and has worked for the South African government, leading a team responsible for the development and implementation of climate change mitigation policies. Her current role includes assessing the effectiveness of national governments' in GHG emission reduction targets, policies and action.



**Dr. Philipp Zehmisch**

is Senior Academic Staff of Anthropology at the South Asia Institute, Heidelberg University. He has worked extensively on diverse fields of anthropology in the Indian Ocean region. His research combines Political Anthropology, Subaltern, Borderland, and Migration Studies in order to understand the long-lasting legacies of the partition of British India.



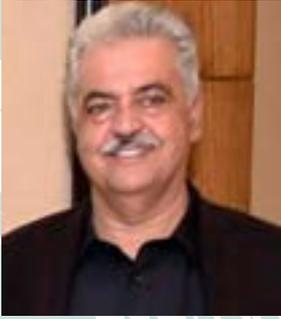
**Mr Ahmed Kamal**

is the Chief Engineering Advisor and Chairman Federal Flood Commission (FFC). He also the chairman of Pakistan National Committee on Irrigation Drainage (PANCID) and holds additional charge of Member IRSA. He holds an extensive 30 years experience in field of Water resource management, flood control and forecasting, disaster risk reduction mechanism.



**Mr. Asjad Imtiaz Ali**

is erving as Chairman Indus River System Authority (IRSA). He holds extensive experience in the field of water and energy mangment. He has previously served as chairman federal flood commission, CEO Alternative Energy Development Board (AEDB), Director Islamabad Electric Supply Company (IESCO) and National Transmission & Despatch Company (NTDC).



**Mr Basheer Tareen**

is the provincial coordinator for floods in irrigation department Balochistan. He holds over 31 years of experience in water sector. Mr. Tareen has received his Bachelors in Civil Engineering degree from NED University of engineering and Technology Karachi in 1991. .



**Mr Aamir Khan**

is working as Head / Chief, Strategic Planning & Reform Unit, Punjab Irrigation Department, Pakistan. Recently, he has been assigned the charge of Director General, Punjab Water Services Regulatory Authority and responsible for implementation of Punjab Water Act. He has extensive experience in the area of foreign funded ventures, resources allocation, financial management for various mega projects and water Governance.



**Syed Mujtaba Hussein**

is the Director General and Special Assistant to the Minister, Ministry of Planning, Development and Reforms, Government of Pakistan. He is one of the lead negotiators for Pakistan on Climate Change negotiations under the UNFCCC. He has remained as the National Focal Point for UNFCCC, Designated National Authority (DNA) for Adaptation Fund and for issuing host country approval to projects for securing carbon credits



**Dr. Mazhar Hayat**

is a Civil Servant, holding Ph.D in Environmental Policy from South Korea. Previously he has served as Deputy Secretary (International Cooperation), National Program Manager (Ozone Unit), and National Technical Adviser. He has represented Pakistan at various international forums like Conference of Parties (COP), IPCC, UNFCCC etc. Currently he is serving as Deputy Secretary at Ministry of Water Resources.



**Ambassador Shafqat Kakakhel**

is a renowned expert on climate change and related policies. He also represented his country as permanent representative to the United Nations Environment Programme and the United Nations Centre for Human Settlements-HABITAT. He has also served as elected president of the United Nations Environment Programme's governing council and was also the chief negotiator for G-77 countries in preparatory meetings of the second World Summit on Human Settlements. .



**Ali Tauqeer Sheikh**

is the principal author of Pakistan's updated NDCs submitted to UNFCCC in 2021. He has served on several national commissions and international committees including the advisory group on learning and Evaluation and the transformational Change and learning Partnership (TCLP), setup by Climate Investment Fund on behalf of World bank and multilateral financial banks.



**Dr Zaigham Habib**

is an Islamabad based hydrologist and water management expert. Dr Zaigham has carried out studies like, environmental flows assessment, post flood rehabilitation, climate change impacts on water demands, sediment transport in large canals, and water accounting at the National and Provincial levels. Currently, she is carrying out a land and water resources assessment study with Food And Agriculture organization (FAO) of UN



**Ms. Kashmala Kakakhel**

is an expert in international policy on climate finance, with special emphasis on the needs of developing countries. She has over 16 years of experience of working with governments and development partners in South Asia and Africa. Ms. Kashmala has supported the Prime Minister's Office of Pakistan in developing key policies on green growth and governance, and has been part of Pakistan's delegation to International Climate Forums.



**Zofeen T. Ebrahim**

is an independent journalist who has written extensively on development issues including climate change, water, energy, renewables, sanitation, health, gender, child rights, women's rights and diseases. She contributes regularly to national English dailies like The Dawn (where she worked from 1994-2001) and The News as well as international media outlets, including the Inter Press Service, The Guardian, The Third Pole, Thomson Reuters Foundation, etc. She has also worked as consultant with NGOs and INGOs. .





# **EXECUTIVE SUMMARY**

## Background

NDU planned to carry out an intellectual exercise and come up with a way forward to assess the “CLIMATE CHANGE: CAUSATIVE FACTORS, IMPACTS ON PAKISTAN AND WAY FORWARD”. In order to accumulate policy recommendations for developing resilience and mitigating the effects of climate change, it was decided that the subject will be further explored in collaboration with all stakeholders, national and international field experts, policy makers, government representatives to take this exercise to an objective and logical conclusion.

## Methodology Adopted

NDU decided to hold an initial seminar on “CLIMATE CHANGE: CAUSATIVE FACTORS, IMPACTS ON PAKISTAN AND WAY FORWARD” on 21st December 2022, for setting the stage and then further brainstorm the climate change impacts on Pakistan via focused roundtable on 28th December 2022. Lastly, a final seminar was planned to be conducted in January 2023, where all the decision makers were planned to be invited and final recommendations collected through these brainstorming sessions to be proffered.

## Vision

The exercise aimed to sensitize climate change as an existential threat, posing large scale challenge to diverse aspects of national security of Pakistan, understand the national and international policy landscape required to reset Pakistan course to develop resilience, and assess Pakistan's efforts in adaptation and mitigation against the challenges emerging from the diverse effects of climate change. The recommendations provided in this document take into consideration Pakistan's climate change profile and its impact on socio-economic mosaic of the country, and stress that policy interventions will require continuous assessment against each set objective.



## Objectives

The main objectives of this exercise are summarized below: -

- Evaluate how climate change is an existential threat to Pakistan
- Explore how climate change poses serious threats to national security of Pakistan
- Analyze the causative factors of climate change in Pakistan
- Discover the issues related to climate change and their implications on Pakistan
- Analyze the basic challenges and issues in policies related to climate change.
- Proffer workable strategies for adaptation and mitigation of the adverse effects of climate change in Pakistan

# FINDINGS & RECOMMENDATIONS

## ► Policy Level

- In terms of climate change initiatives, Pakistan has thoroughly accommodated all major domains including climate adaptation initiatives, water and sanitation policies, land management and food security initiatives, as well as alternative energy resource transitional developments.
- The National Adaptation Plan is being devised by Ministry of Climate Change in order to accommodate broader climate vulnerable domains within Pakistan; however, the plan is in progress and under negotiation with the UN Environment Program.
- Likewise, National Flood Protection Plan-IV (NFPP-IV) has also been prepared by Federal Flood Commission (FFC) of Ministry of Water Resources (MoWR), as one of its important functions. The NFPP-IV aims to enhance country's resilience to future floods and its ability to adapt to climate change through implementation/ installation of structural and non-structural flood management interventions

## ► Adaptation

- In terms of Integrated Water Resource Management, Construction of Underground Storm Water Tanks/Reservoirs in urbanized Areas, and Improvement of Existing Storm Drainage System of Urban Areas by CDA, ICT, WASA Rawalpindi etc.
- Construction of Artificial Wetlands/ Restoration of existing Wetlands along major rivers for absorption of flood peaks and promote ecosystem-based interventions under PIDs, PADs and other concerned Departments.
- Ministry of Water Resources to decode unattended National Water Policy-2018 into implementation framework, strategies, projects with focus on integrated water resource management (IWRM) with stringent timeline.
- Pakistan Council of Research for Water Resources to undertake a comprehensive project on water conservation, aquifer recharge and quality assurance of water resources across the country.
- Ministry of Water Resources to identify Nature-Based

Solutions (NBS) in national context to promote water storage and development. Small dams and ponds to be encouraged.

- The establishment of surplus, dams, floodwalls and micro drainage facilities can instantly diminish the severe effects of next year's monsoon. We need to increase our storage capacity. 2D (Dam and Drainage) approach should be adopted.
- River Acts should be realized in all the provinces and existing land use regulations be implemented strictly in letter and spirit to avoid major loss of life and property in future floods.
- WAPDA and Federal Flood Commission to field a joint Commission to examine the flood water drainage issues, being attributed to the LBOD and RBOD and submit practical recommendations, by taking all stakeholders on board, to the competent forum for approval and action.
- Construction of third phase of RBOD in lower Sindh region must be executed with immediate effect by Sindh Govt. being provincial phase of the overall project. Funding may be generated by Sindh province in collaboration with Federal Govt. or WAPDA may be tasked by the Federal Govt to do the needful. Similarly Redesigning and Reconstruction of LBOD in consultation with original donors (WB and ADB) should also be initiated immediately.
- Community based solutions are also required in order to expedite the process of climate adaptation throughout the most affected regions across Pakistan.
- We need to reevaluate our crops like Rice and Sugarcane in view of shortage of water in Pakistan.
- Promote rain harvesting both in rural and in urban areas as well as at household level. These practices include the Surface Runoff method, Groundwater recharge and rooftop harvesting.
- Ministry of National Food Security and Research with technical lead of Pakistan Agriculture Research Council (PARC) to devise, in consultation with all stakeholders, a mechanism and implement it for effective, impactful, and quantifiable outreach program for farmers on crop choice, on farm water

management, managing droughts, changing cropping patterns and identify Nature Based Solutions (NBS) to promote food security.

- Prepare an integrated natural hazard zoning map of Pakistan including AJK. Integrate hazard zoning into land use and urban development through zoning regulation.
- Identify the flood and drought vulnerable areas at local / Community level and develop mitigation strategies against those vulnerable areas and communities.
- Identify low flood risk areas for future land use planning.
- Identify safe areas for evacuation of people and livestock from vulnerable localities. Similarly, early warnings in the flood prone areas provide ample time for evacuation of lives and property. A comprehensive climate data sharing, multi-hazard early warning and climate information system is required for this purpose.
- Encourage resettlement/ relocation of villages outside the flood plains.
- Update / implement river laws to protect streams, rivers banks and its flood plain areas from encroachments.
- Develop and provide incentives to encourage disaster resistant construction, particularly in rural areas (model are available).
- Develop efficient rescue mechanism, relief and rehabilitation options and their implementation strategies before a disaster occurs.
- A concerted effort is needed to have an accord with Afghanistan on the flow of Kabul River similar to that of Indus Water Treaty with India, in the light of upper and lower riparian rights for better management of water and to avoid overall deficiency in future.
- Three specialized project development units to be immediately established; one each at MoCC, Pakistan Planning and Management Institute (PPMI) and National Disaster Risk Management Fund (NDRMF). The units will develop need-based concept notes and project proposals, particularly, to tap international climate finance windows to which

Pakistan is entitled.

- MoCC should notify guidelines/ regulations for the public and private project proponents for prompt access to the international climate finance windows. The Ministry should ensure transparency and ease of doing business.
- Ministry of Planning, Development and Special Initiatives (M/o PD&SI) to also devise mechanism to prioritize budget allocations to the projects and infrastructure designs having exceptional climate change mitigation and adaptation impacts and vice versa.
- There should be climate finance section indigenously inside all federal and provincial ministries/departments which should be well equipped to develop national or provincial level project proposals based on needs assessment for an internationally competitive climate finance arena.
- Expertise should be achieved in obtaining Carbon Credits in order to have the maximum benefit of this climate financing opportunity.
- Climate resilient infrastructure, particularly, during the rehabilitation process in flood hit areas was considered of prime importance. Building back better will only be possible if we climate proof all our investments in development sector.
- Strengthening of the MoCC, Federal Environmental Protection Agency as well as provincial ministries and departments of environment such as the Ministries of Energy; Water Resources; Food Security; the AEDB, the NDMA, provincial DMAs is important to develop adaptation and mitigation strategies for Pakistan. An effective coordination mechanism as per Rules of Business is required to be revitalized. MoCC to coordinate all the recommended actions and to biannually hold national stock-take conference to present the actions undertaken, gaps identified, and forging practical way forward. First national stock-tack conference on climate conference to be held in June, 2023. The conference will be open to all stakeholders, national and international development partners as well as general public.
- Build capacity of the existing line institutions and establish specialized smart institutions. MoCC to devise and execute a comprehensive capacity

building plan for all stakeholder, public as well as private sector, on all contours of the climate change like decoding decisions of the international climate treaties towards action, climate finance, technology transfer, thus paving way for enhanced climate action in the country. The capacity building initiative will be a permanent feature of the Ministry. However, first phase to be completed during the year 2023-2024.

- The restructuring of Federal Flood Commission (FFC) into a vibrant and exclusive Flood Management Authority is earnestly suggested to work at national level to deal with flood protection planning and management issues in a more coherent, inclusive, & well-coordinated manner and to also cater for issues related to urban/rain-caused flooding and for all water related adaptation measures.
- Operationalization of the National Climate Change Act adopted by the Parliament in 2017 providing for establishment of a robust institutional architecture for addressing climate change issues is the need of the hour.
- There should be regular meetings of the Climate Change Council as well as formulated Authority to supervise, and monitor the climate mitigation and adaptation initiatives going on at National level.
- Joint ventures should be enhanced with private sector climate change organizations, researchers, practitioners and investors in order to harness the full potential of project planning and execution at federal as well as provincial level.
- Empower local communities particularly women for effective climate response and making them more resilient to climate induced hazards. A bottom-up approach should be the hallmark of all proposed actions. Wherein, vulnerable communities be engaged to the maximum extent. The actions should not be undertaken in silos or limited to the extent of big cities.
- Stock-take available expertise, gaps, and needs of Global Change Impact Studies Centre (GCISC) and Pakistan Meteorological Department (PMD) and build their capacity to make them state of the art and impactful institutions.
- MoCC should issue regulations for mandatory data reporting by the industry, business, and other polluters.

- Pakistan Bureau of Statistics (PBS) be strengthened in terms of becoming climate data repository and provide data to end user with authenticity and transparency for research and outreach purposes.
- Diamir- Bhasha and Kalabagh dam should top the list of priority projects.
- Authorities need to emphasize their concern for the built quality of infrastructures as the construction quality would be as important as the design itself.
- Ministry of Planning Development and Special Initiatives (M/o PD&SI) and line provincial departments to amend project proforma (PC-I) by adding climate impact assessment and climate resilience of the development project at project planning stage.
- Illegal construction should be strictly monitored. Law of encroachment should be implemented to avoid loss of human lives in case of a disaster. Local law enforcement agencies and encroachment departments should be accountable in this regard.
- Climate Change should be a federal subject to avoid lack of coordination between provinces on issues relating to climate change like water distribution etc.
- Duplication of research be avoided as it is a waste of time and resources in all provinces of the country. A centralized body supervising the research projects should be made within MoCC to act as a bridge between government and research departments.
- Effective implementation of global climate change regime at national level is hindered due to lack of integration in Climate Change relevant departments of government at federal and provincial level. Fulfilment of International climate change commitments would require close co-ordination across government agencies.

## ► Mitigation

- The NDCs determined should be realistic and based on active implementation of policies. They should focus on achievable short term as well as long term goals with clearly demarcated timeline.
- Afforestation is the ultimate solution to reduce the greenhouse gas emissions (Carbon sink). Projects already undertaken by the government at federal as well as provincial level should be enhanced and



yearly nationwide afforestation drive should be planned and promoted at educational, corporate and civil / military institutions. National Forest Policy 2015, programs like Clean Green Pakistan and "Ten Billion Tree Tsunami" should be implemented nationwide with transparency and accountability.

- Electric Vehicle Policy- 2019 should be adopted and conducive and affordable arrangements should be made for adopting electric or Hybrid vehicles at public as well as government level. Make all efforts to achieve milestones promised in our NDCs with regards to EVs (30% Vehicles on electricity by 2030).
- Public transport should be made high quality, affordable, accessible and comfortable enough for the general masses to adopt at daily basis to cut off major carbon emissions from vehicles burning fossil fuels. Encourage mass transit mechanisms.
- Alternative Energy Development Board (AEDB), in collaboration with Private Power and Infrastructure Board (PPIB) and NEECA should undertake enhanced and additional actions to proliferate renewable energy technologies in line with NDCs as submitted by the Government of Pakistan to United Nations.
- Bio-energy generation and greenhouse-gases mitigation through organic-waste utilization should be encouraged in urban centers like Karachi and Lahore. In addition to power generation, the plants can also produce high-grade organic fertilizer.
- Thar coal project should be continued with full potential as the project promises huge energy generation. There is no need to be apologetic about it as Pakistan is already a low emitter of GHGs. Its coal plants are relatively new than big emitter countries. However, new technology which can mitigate the harmful effects of coal power plants should be fully incorporated as a long-term measure to prevent GHG resulting from direct burning of coal.
- One known technology for eliminating stubble burning is the 'happy seeder' which breaks down rice stubble (mulching it to the ground), and plants wheat seeds simultaneously.
- The government needs to ensure that Kilns are not built alongside residential areas and existing kilns located close by are either moved elsewhere in the long term or monitored to ensure that they effectively manage their air emissions. Zig-zag technology, stacking the bricks in a zig-zag pattern instead of straight line should be encouraged for adoption.
- The government should force car manufacturers to install Catalytic converters into their vehicles to reduce the Carbon emission. Until electric vehicles hit the road, installing catalytic converters in automobiles is necessary, as catalytic converters tend to reduce harmful gas emissions by 90%.
- We also need to replace Euro-2 fuel standards of automobiles with Euro-5, since both fuels cost roughly the same, whereas Euro 5 has higher fuel average and less harmful emissions besides improving the fuel quality.





**PRELUDE**



- ▶ Climate change is real and it is already showing its impacts. Drought hit Europe and unprecedented floods in South Asia, particularly in Pakistan, are real time examples of the climate induced disasters. Climate change has been attributed, mainly, to the burning of the fossil fuel. Historically, the global warming is an outcome of the carbon emissions made by the developed countries due to their economic growth model since mid-19th century's industrial revolution. At present, China, US, India and European Union are major emitters of greenhouse gases (GHG). China is the biggest emitter at 26.4% of global GHG emissions, followed by the United States at 12.5%, India at 7.06%, and the European Union at 7.03%. Global average temperature has already risen by 1.1o C and it is on its way to further rise with rather higher pace.
- ▶ The multitude of challenges posed by climate change, and contestation between historical and current emitters envision geopolitical implications. The difference of responsibilities and associated concept of Shared but Differentiated Responsibilities (SBDR), unrealistic emission reduction commitments, weaker abidance to climate finance facilities, and contested climate diplomacy between US and China indicate the prospects of weaponization of climate change for developing countries. Similarly, Chinese monopoly in clean and green technology and US \$369 Billion Inflation Reduction Act are nuances of geopolitical impacts of climate change. At present the international response to climate change is largely affected by existing geopolitical rivalries, weaker regional cooperation and discontinued abidance to climate change and has transformed this climate crisis into climate dilemma.
- ▶ Adverse impacts of climate change on water sector, agriculture, and food supply chains are visible and expected to worsen further. UN Convention on Climate Change, adopted in 1992, has provided platform for global climate governance. In response to UN Intergovernmental Panel on Climate Change (IPCC)'s climate science assessments during the last three decades, nations across the globe are seriously thinking and acting for protection of the climate and enhancing resilience of the vulnerable communities and eco-systems. Technological and financial means are being explored and mobilized to mitigate climate change by reducing carbon emissions as well as to take measures to adapt the climate change.
- ▶ With this back drop, Institute of Strategic Studies Research an Analysis (ISSRA), National Defence University (NDU) has undertaken initiative by providing a platform to the national as well as international experts to deliberate upon the climate change issue, underlying risks and plausible way forward for Pakistan to effectively tackle the ongoing as well as projected impacts of the climate change. The methodology adopted for this strategy paper included desk review of both academic and grey literature, interactive seminars, roundtable discussions, and semi-structured interviews. The subject has been explained under following parts: -
  - **Part I** - Historical Context
  - **Part II** - Assessment and Way Forward
  - **Part III** - Conclusion





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# **PART – I**

## **HISTORICAL CONTEXT**





## ► International Policies

- The International community started recognizing unnatural and spontaneous climate change patterns in the early 1970s. And in 1972, the United Nations conducted a Conference on Human Environment (UNCHE) which had a primary focus on international environmental issues and development of international environmental politics. Following the UNCHE, the scientific data was made public in order to spread climate change awareness throughout the international community.
- The First World Climate Conference (FWCC) held in 1979, was inspired by the scientific campaign and nations were urged to provide insight on the matter. This conference also laid groundwork for the establishment of the Intergovernmental Panel on Climate Change (IPCC), in order to provide updated climate change statistics, changing patterns and their possible immediate and future impacts.
- Climate threat was collectively recognized by international community at the Second World Climate Conference (SWCC) 1990, which invited the leaders of all recognized states in the international society in order to negotiate on the division of state responsibilities with respect to climate change responses. Following the SWCC, Rio Earth Summit was conducted in an attempt to recognize urgent and future potential environmental issues and protection of environment and socio-economic development.
- Ultimately, in 1992, the United Nations Framework on Climate Change Convention (UNFCCC) was

adopted by the international society, and it was signed by 154 states in order to legally bind these states under international law.

- The UNFCCC led to the annual Conference of Parties (COP) that commenced in the year 1995, and up till 2022, there have been twenty-seven conferences, each conducted in different cosmopolitan cities around the world. However, there have been only three monumental frameworks led by these conferences, which include the 3rd, 21st and 27th COPs.
- The landmark Kyoto Protocol was signed in 1997 during COP-3, which laid down greenhouse gas (GHG) emissions reduction targets for the developed countries, an average of 5% by 2008. Kyoto protocol targeted emission reduction and in 2015



COP-21 led to the Paris Agreement, which had a sole purpose to limit global warming within the range of 1.5 - 2 degrees Celsius. Kyoto Protocol obliged only industrialized countries to reduce carbon emission. However, under the UN Paris Agreement all countries, developed as well as developing, are required to reduce carbon emissions as well as to take measures for climate change adaptation.

- Most recently, the 2022 COP-27 was focused on taking actions towards achieving the world's collective climate goals as agreed under the Paris Agreement and the UNFCCC. Other than that, frameworks with respect to climate financing were also introduced, especially the 'Loss and Damage Fund' which addresses the loss and damage caused by climate induced disasters for low emitter developing countries. Although some climate finance is flowing from the industrialized countries towards the developing countries but it is falling short of their commitments as made under the UN Convention on Climate Change and underlying climate action. The severity of the issue, on the other hand, cannot afford delayed response.

## ► Domestic Climate Change Policies

- Pakistan's climate resolve began with the establishment of Environment and Urban Affairs Division at federal level in 1974 which was later upgraded to Federal Ministry of Environment in 1989. Pakistan enacted its first Pakistan environment protection Ordinance in 1983, as the first comprehensive environment centered legislation.
- National Conservation Strategy and National Environment Quality Standards were adopted in 1991 and 1993 respectively, aimed at providing broad framework for addressing environmental challenges. Furthermore, in 1997 Pakistan Environmental Protection Act was legislated, with country wide enforcement range.
- With the beginning of 21st century, Pakistan's environment resolve got a boom and National Environmental Policy 2005 was introduced aiming at Protection, conservation, rehabilitation and improvement of environment, for the prevention and control of pollution, and promotion of sustainable development.

- Pakistan's climate change policies have been developed since 2008 when a multi-stakeholder task force was set up by the Planning Commission to assess the impacts of climate change on Pakistan and propose elements of an appropriate response.
- Broad range of Environment threats were addressed in Drinking Water Policy 2009 which was aimed at the protection of fresh drinking water reserves through the safe disposal of solid and liquid wastes, and the treatment of sewage sites.
- A Task Force was established which received inputs from a number of inter-ministerial working groups and submitted its report in 2010. This report served as the basis of the National Climate Change Policy (NCCP) issued in 2012; the Framework for the Implementation of the NCCP issued in 2013; and the Updated National Climate Change Policy announced in March 2022.
- National Sanitation Policy was also established in order to envision a creation of an open defecation free environment with country-wide safe disposal of liquid and solid waste. Adjacently, there are four major water conservation, treatment and sanitation initiatives. Similarly, few developmental initiatives were also introduced with respect to land management and reduction in food insecurity due to the disruption of agricultural lands. Apart from these, in accordance with climate adaptation initiatives,





Pakistan has introduced several comprehensive policies relating to all facets of Climate Change Adaptation and Mitigation (see Annex A).

- The Framework for Implementation of Climate Change Policy was prepared in 2013 which provides a guideline for the implementation of the NCCP by considering both the current and future anticipated climate change threats to the country. The framework document aims to provide a basis and forms the building block that will lead to the development of a National Adaptation Plan, National Appropriate Mitigation Action, and the preparation of the Second National Communication to the UNFCCC.
- Furthermore, the Forestry Policy was introduced in 2016 with the aim of Expansion of national coverage of forests, protected areas, natural habitats and green areas for restoration of ecological functions and maximizing economic benefits while meeting Pakistan's obligations to international agreements related to forests.
- Renewed Pakistan Climate Change Act- 2017 was prepared, which envisages establishment of a high-powered Pakistan Climate Change Authority and Pakistan Climate Change Fund. The Fund aimed at mobilizing resources from both domestic and international sources for providing finances to support mitigation and adaptation initiatives in the country.
- A comprehensive Water Policy was prepared in 2018 which aimed at Integrated Water Resource Management by preserving fresh water aquifers/reservoirs and the treatment of wastewater in order to conserve more water. Moreover, in light of food insecurity, a National Food Security Policy was introduced in 2018, which was aimed at enhancing food availability, provision of food rations to affected areas (improving food access), enabling of food utilization, decreasing food wastage and ensuring food stability at all levels to reach the declared vision of a food secure Pakistan. Also, the 2018 Food Security Policy of Pakistan aims at promoting sustainable food production systems by an average growth rate of 4% with goals of improving food availability, accessibility and sustainability. Making agriculture more productive, competitive and climate friendly have been one of the key policy planks, increasing food productivity, accessibility and sustainability.
- In terms of Afforestation, the 2019 Clean Green Pakistan is a flagship initiative aimed at tree plantation and hygiene management within different cities/tehsils throughout Pakistan of preserving fresh water resources. Furthermore, in terms of city hygiene, the initiative carried out rigorous solid and liquid waste management initiatives, including water treatment and water conservation. Similarly, Water Sanitation and Hygiene (WASH) policy was also adopted in 2019, which was focused on improving the quality of water supply and ensure access to safe drinking water to nine percent of the population deprived of it. A landmark Alternative and Renewable Energy Policy was also introduced focusing on the development of an efficient, sustainable, secure, affordable, competitive and environment friendly power market while promoting indigenization of technology and the development of skilled human resource and local manufacturing capabilities in ARE Technologies. First National Electric Vehicle policy was also introduced, aiming at Mitigating climate change through a reduction in emissions from transport sector. Reducing country's oil import bills and develop affiliated industry such as battery manufacturing, charging infrastructure etc.
- The 2022 upgraded climate policy was originally introduced in 2021, which states that “the most immediate and pressing task for the country is to

prepare itself for adaptation to climate change” but adds that despite its small contribution to global GHGs emissions, Pakistan is giving due importance to mitigation efforts in sectors such as energy, transport, forestry and agriculture, industries, and urban planning in order to underline “its role as a responsible member of the global community in combating climate change.” Also, the five year National Electric Vehicle Policy 2020-2025 was drafted objectifying creating a pivot to industrial growth in Pakistan and encourage auto and related and contributing to reduction of external deficit through reduction in overall share of oil import bill by shifting to EVs industry to adopt EV manufacturing In this regard Ministry of Industries and Production, Ministry of Science and Technology and Ministry of Energy will work in conjunction under the lead of ministry of climate change.

- In 2022, Hazardous Waste Management Policy was also introduced in order to reduce sanitation related pollution and its impact. It aims at creating an enforcement mechanism through regulatory frameworks, and monitoring inspection and verification systems related to waste management.

## ► Assessment

- All the recommendations contained in our climate policies are sound and unexceptionable; they are largely based on the contents of the Task Force as well as the published works of renowned climate experts and inter- governmental and non- governmental organizations: -
  - In terms of climate change initiatives, Pakistan has thoroughly accommodated all major domains including climate adaptation initiatives, water and sanitation policies, land management and food security initiatives, as well as alternative energy resource transitional developments.
  - The National Adaptation Plan is being devised by Ministry of Climate Change in order to accommodate broader climate vulnerable domains within Pakistan; however, the plan is in progress and under negotiation with the UN Environment Program.

- Likewise, National Flood Protection Plan-IV (NFPP-IV) has also been prepared by Federal Flood Commission (FFC) of Ministry of Water Resources (MoWR), as one of its important functions. The NFPP-IV aims to enhance country's resilience to future floods and its ability to adapt to climate change through implementation/ installation of structural and non-structural flood management interventions.
- Aforementioned policy initiatives present Pakistan's sturdy resolve towards climate crisis. Pakistan is consistently ranked by multiple climate change vulnerability indices as being one of the most vulnerable to the impacts of climate change due to drought, floods, heat waves, and glacial lake outburst floods in the past few decades. The government is cognizant of this issue and is taking strategic adaptation measures at the policy management and operational level to minimize the effects. The efforts to overcome the challenges of climate change are made through enacting legislation, setting standards and developing and implementing policies for a secure and lively environment.
- There is however a plethora of policies but the incapacitated enforcement coupled with absence of institutional coordination and coherence has hindered Pakistan's resolve to counter climate crisis. In this regard, operationalization of National Climate change act 2017 and establishment of Pakistan climate change authority still await implementation.
- Despite minimal institutional capacity to execute policies, Pakistan has exhibited a positive trajectory at international forums. Diplomatic success at the most recent COP 27 and International Conference on Climate Resilient Pakistan for Floods 2022 have culminated in bringing positivity home in the form of Loss & Damage Fund and multibillion commitments for rehabilitation and reconstruction in the flood affected areas. Here, the government and Ministry of climate change Pakistan with the concerned departments must accelerate the unprejudiced rehabilitation of flood affected people and materialize the diplomatic successes in true letter and spirit.



Climate Events Changing

↑ Surface Air Temperature Rising 



↑ Sea Level Rising

↑ ↓ Habitats and Distribution

nd Species  
ns Changing

**PART – II**  
**ASSESSMENT AND**  
**WAY FORWARD**



## ► Climate Change as an Existential Threat to Pakistan

- Climate change is triggering a number of non-traditional security challenges by compromising human health, sustainable supplies of food, water and shelter as well as exposing vulnerable communities to the intensified natural hazards. These challenges could compromise national as well as regional and global security in terms of human life and property. Pakistan ranks one of the top 10 countries, most affected by the impacts of climate change. Despite having minimal carbon footprint, Pakistan is subjected to climate injustice, which pictures the global north being the culprit and global south made to suffer the devastation. Pakistan is witnessing drastic changes in its hydrological system in the face of Deglaciation. These include Glacial Lake outbursts, super charged cycles of monsoon and 190% higher than the average rainfall in 30 years. Along with hydrological system, Pakistan's average atmospheric temperature is rising at a drastic rate, and in 2022,. From March-May 2022, Pakistan recorded some of the highest temperatures in the country in the last 60 years. Ferocious Forest fires in Balochistan and Margalla hills were also a result of climate change. 1.8 million acres of arable land is lost to rising sea level every year. Such rapid and ravaging changes in climate have challenged the very existence of Pakistan, posing traditional and nontraditional security threats at large.
- Climate Change has translated into the environment

and our lives having multiple and diverse impacts. Pakistan's already fragile economy is striving in the midst of super floods of 2022. Estimated damage caused by 2022 floods is \$30 Billion, including infrastructure and system disruptions and agriculture loss of standing crops at a vast 9.4 million acres which is likely to hamper the economic development in the coming years. Inflation rate is projected to rise by 18% in financial year 2023 and overall climate change is expected to impact Pakistan's GDP by 9.1% annually. Along with this, human security is also threatened by the increasing food insecurity, which is expected to rise 40%-60% by 2050 in Pakistan. Increased temperatures and associated heat waves in the country have not only claimed human lives and livestock death toll but also severely impacting crop produce thus instigating food insecurity in subtle way. Climate induced disasters and events such as melting of glaciers are playing havoc with the country's economy, water and food security, thus posing existential threat to Pakistan.

## Adaptation

- According to a study in 2012, approximately 6% of the total area of Pakistan is in high-risk zones, while 30% is in medium- risk zones. Pakistan has witnessed a surge in climate induced natural disasters in the recent past like heat waves, forest fires, GLOFs, droughts and flash flooding. Average Annual loss (AAL) from floods in Pakistan is estimated at almost \$1.5 billion, which is the highest annual loss. Around 93% of the average annual damage from



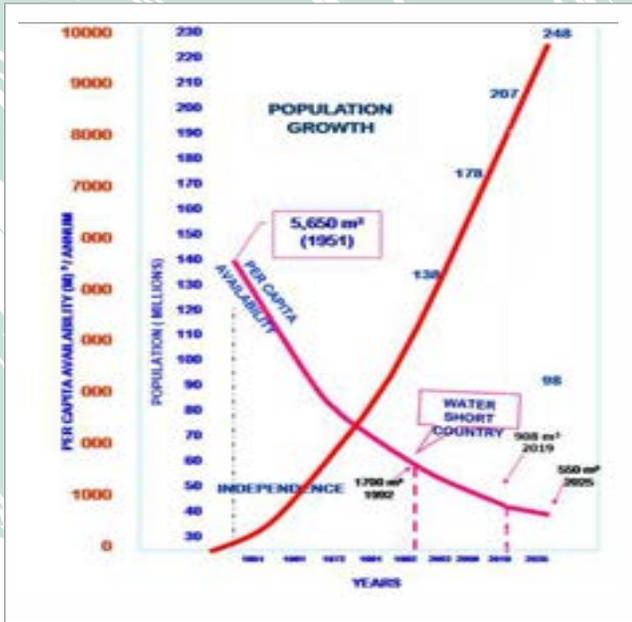
floods occurs in Punjab and Sindh provinces, where damage totals \$938 million and \$456 million per annum. 2022 Floods have caused huge damage to the people, infrastructure and national exchequer, depicting increased intensity of the disasters, leaving one third of the country submerged and 1,739 deaths, 12,867 injured besides 33.046 million people displaced with post disaster rehabilitation and reconstruction needing \$30 billion. Similarly, from March-May 2022, Pakistan recorded some of the highest temperatures in the country in the last 60 years.

- Access to water is also threatened, linked to a drought brought about by the heat wave. Sindh and Balochistan received below normal rainfall during the month of May with mild to moderate drought conditions in these areas, while from July onwards, Balochistan received +590%, whilst Sindh received +726% rainfall above average with prolonged monsoon, damaging 45 dams in Balochistan. Lack of escape channels and aged Infrastructure/Barrages (none of the barrages except Taunsa was remodeled during the past 63 years) has been observed in 2010 and 2022 floods. Institutions at Federal and Provincial levels, such as Ministry of Climate Change (MoCC), Ministry of Environment (MoE), National Disaster Management Authority (NDMA) and corresponding provincial authorities are not adequately prepared to cope with such unprecedented floods in the context of Global Climate Change, as they focus more on post disaster management rather

early warning system development and installation. In nutshell, 2022 floods were combination of riverine, GLOF and torrential rain induced, and lack of preparedness on part of disaster management authorities exacerbated the damages indicating a serious challenge ahead to adapt to the severity of Climate Change. Moreover, Land use change, particularly conversion of agriculture land and grasslands for housing societies and related infrastructure, is rampant in Pakistan. Population increase and economic development have driven extensive land-use changes in Pakistan. Experts also noted that land use change further aggravated the flood situation. Wheat and cotton production are highly dependent on weather conditions and face serious challenges from climate change and variability, including changes to precipitation, floods, droughts, and rising temperatures. With this backdrop, the main issues that need focus in our adaptation strategy are discussed in succeeding paragraphs

## ► Water Management

- **Water Scarcity** Water scarcity has already become a terrifying reality in Pakistan. The nation is ranked 14th out of the world's 17 very high-water risk nations, which also includes hot, dry nations like Saudi Arabia. In the country, more than 80% of the people experience "severe water scarcity" for at least one month of the year. Pakistan's groundwater resources are also extensively depleted, as 80% of water supplies are unsafe, while 95% of water is utilized in the agriculture sector, primarily to supply water for irrigation, which is why if nothing changes, by 2025 the entire nation might experience "water scarcity".
- **Recommendations**
  - Construction of Underground Storm Water Tanks/Reservoirs in urbanized Areas, Islamabad Region and Improvement of Existing Storm Drainage System of Urban Areas by CDA, ICT, WASARawalpindi etc.
  - Construction of Artificial Wetlands/ Restoration of existing Wetlands along major rivers for absorption of flood peaks and promote ecosystem-based interventions under PIDs, PADs and other



concerned Departments like FFC, MoWR for overall coordination, project monitoring & management.

- Ministry of Water Resources to decode unattended National Water Policy-2018 into implementation framework, strategies, projects with focus on integrated water resource management (IWRM) with stringent timeline.
- Pakistan Council of Research for Water Resources to undertake a comprehensive project on water conservation, aquifer recharge, and quality assurance of water resources across the country by taking all stakeholders on board.
- Ministry of Water Resources to identify Nature-Based Solutions (NBS) in national context to promote water storage and development. Small dams and ponds to be encouraged.
- **Floods.** The experts are of the view that floods of 2022 positively recharged the aquifer across the country and filled existing dams, particularly, in Balochistan. However, lack of preparedness of institutions, faulty structures in place which could not hold the rain water, absence of water storage infrastructure, and compromised drainage system aggravated the flood situation. In Sindh, as it happens after every flood, the

flood water pressure vis-à-vis designed discharge capacity of Left Bank Outfall Drain (LBOD) and non-completion of Right Bank Outfall Drain (RBOD) have come under debate again. The situation, therefore, warranted an integrated water resources management (IWRM) approach as emphasized in National Water Policy of 2018 and improved drainage systems.

## • Recommendations

- The establishment of surplus, dams, floodwalls, and micro drainage facilities can instantly diminish the severe effects of next year's monsoon. We need to increase our storage capacity. 2D (Dam and Drainage) approach should be adopted.
- River Acts should be realized in all the provinces and existing land use regulations be implemented strictly in letter and spirit to avoid major loss of life and property in future floods.
- Implementation of National Master Plan on Flood Telemetry Network (A sub-project of Flood Protection Sector Project-III (FPSP III) with emphasis on improved Flood Telemetry along Hill Torrents (D.G. Khan, Rajanpur & Kirther Range), Secondary & Tertiary Rivers is crucial. Also undertake Flood Management of Hill Torrents to store flood water for irrigation/ecosystem restoration.
- WAPDA and Federal Flood Commission to field a joint Commission to examine the flood water drainage issues, being attributed to the LBOD and RBOD and submit practical recommendations, by taking all stakeholders on board, to the competent forum for approval and action. However, it is suggested that construction of third phase of RBOD in lower Sindh region must be executed with immediate effect by Sindh Govt. being provincial phase of the overall project. Funding may be generated by Sindh province in collaboration with Federal Govt. or WAPDA may be tasked by the Federal Govt to do the needful. Similarly Redesigning and Reconstruction of

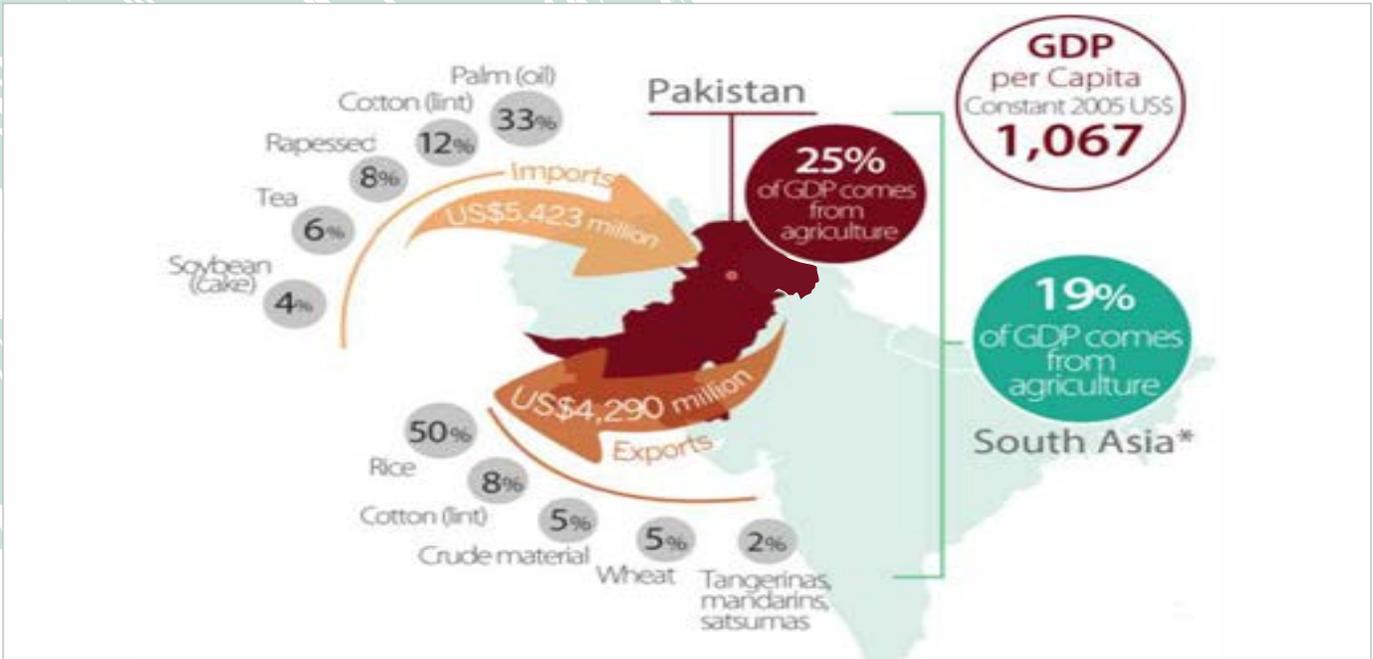


LBOD in consultation with original donors (WB and ADB) should also be initiated immediately.

- Community based solutions are also required in order to expedite the process of climate adaptation throughout the most affected regions across Pakistan. For instance, villages must be elevated at higher grounds in order to bypass flood streams.
- **Seawater Intrusion.** Climate Change has resulted in an increase average global ocean temperatures, causing thermal expansion of water and eventually leading to rising sea levels. This rise in sea levels have disrupted coastal populations as sea water intrusion has substantially effected coastal resources. It is occurring at an alarming rate of 80 acres per day in Sindh province coastline causing degradation of natural resources. All this is due to poor water management and faulty or inadequate dams and drainage mechanism. In routine very less water reaches the Arabian Sea, however, huge water is wasted after Kotri Barrage every year during flood season which needs to be stored and a required quantity is then released to the sea to safe guard marine life and avoid sea intrusion.
- **Recommendations**
  - Pakistan must expedite its Sea Water Intrusion Project, which is aimed at hindering

seawater inland flows in order to minimize the depletion of natural resources in the region. Implementation of Sea Water Intrusion Study findings, stalled since 2005, should be made priority through IRSA.

- As per 2004-5 study by the International Panel of Experts (IPoE), 8.86 MAF water is required downstream Kotri to halt sea intrusion, which should be ensured by constructing dams in the north and also Sindh barrage within Sindh province .
- **Lack of Climate Smart Agricultural Practices.** Pakistan agriculture sector is considered as more susceptible to climate change as its variation can directly affect the crop productivity. Therefore, knowledge about climate smart agricultural production technology is the main component and knowledge gap is at the crux of yield gap. Water usage efficiency is also dependent on these technologies as they directly affect the underground as well as ground water table. The flood water as well as industrial waste water that is polluted, damage the agricultural yield.
- **Recommendations**
  - We need to reevaluate our crops like Rice and Sugarcane in view of shortage of water in Pakistan.
  - Promote rain harvesting both in rural and in urban areas as well as at household level. These practices include the Surface Runoff method, Groundwater recharge and rooftop harvesting.
  - Ministry of National Food Security and Research with technical lead of Pakistan Agriculture Research Council (PARC) to devise, in consultation with all stakeholders, a mechanism and implement it for effective, impactful, and quantifiable outreach program for farmers on crop choice, on farm water management, managing droughts, changing cropping patterns and identify Nature Based Solutions (NBS) in national context to promote food security. The initiative will be a



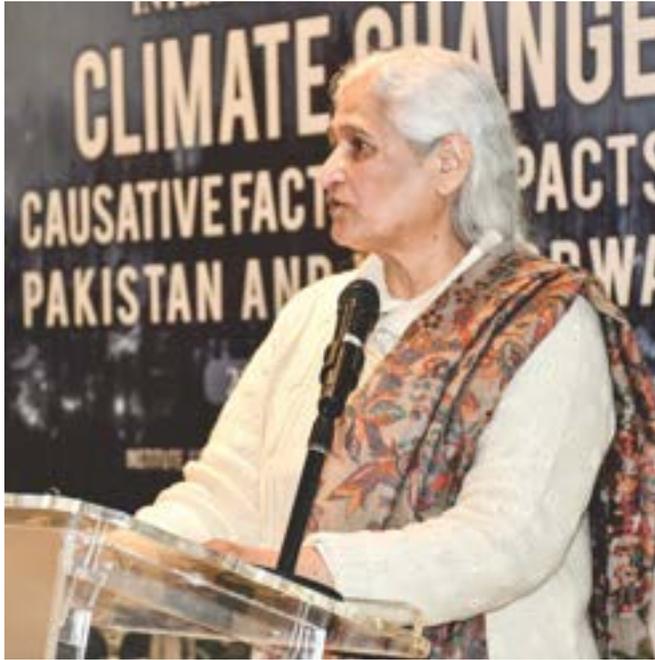
permanent feature of the Ministry. However, first phase to be completed during the year 2023-2024.

- **Disaster Risk Management.** There exists an inherent aspect of unpredictability in Climate Change domain as it does not set a pattern. Therefore, focus on Disaster Management is very important for Pakistan keeping in view the recent years exhibiting worst climate induced catastrophes. Disaster intensity may vary in the coming years but efficient and practical adaptation and risk management is the need of the hour for having a constant management that can build resilience in all sectors of life.

- **Recommendations**

- Prepare an integrated natural hazard zoning map of Pakistan including AJK. Integrate hazard zoning into land use and urban development through zoning regulation.
- Identify the flood and drought vulnerable areas at local / Community level and develop mitigation strategies against those vulnerable areas and communities.
- Identify low flood risk areas for future land use planning.

- Identify safe areas for evacuation of people and livestock from vulnerable localities. Similarly, early warnings in the flood prone areas provide ample time for evacuation of lives and property. A comprehensive climate data sharing, multi-hazard early warning and climate information system is required for this purpose.
- Encourage resettlement/ relocation of villages outside the flood plains.
- Develop evacuation plans with the consent and participation of local communities and also provide training to them.
- Update the flood plain maps for 100 years return period and undertake formulation and enforcement of “River Flood Plain” regulations and laws. Flood Plain Maps, already in place and circulated widely among the provinces, can help determine the extent of inundation and must be used for flood warning in respective districts by the DDMA’s. The maps indicate the areas that may submerge at certain flood level/ river discharge.
- Update / implement river laws to protect streams, rivers banks and its flood plain areas from encroachments.



- Develop and provide incentives to encourage disaster resistant construction, particularly in rural areas (model are available).
- Develop efficient rescue mechanism, relief and rehabilitation options and their implementation strategies before a disaster occurs.
- Set-up a system to ensure that policy and regulatory framework is implemented and enforced.
- **Accord on Kabul River.** In Pakistan, the Kabul River and its tributaries are indispensable for meeting the drinking water and sanitation needs of residents of Peshawar city, irrigation in the small but fertile Peshawar Valley and the sub-regions of Tank, D.I.Khan and North Waziristan. The Kabul River supports the 250 MW hydropower dam in Warsak built in 1960. Afghanistan has proposed 12 projects on the Kabul River and its tributaries, while five small dams have been completed and operational. One of the proposed projects is the Shahtoot Dam that India agreed to build, with a memorandum of understanding signed in February 2021. In coming future, Pakistan is likely to face shortage of water in its Indus River System due to climate change. A significant reduction in the water flows of Kabul River due to these dams would aggravate the situation and seriously

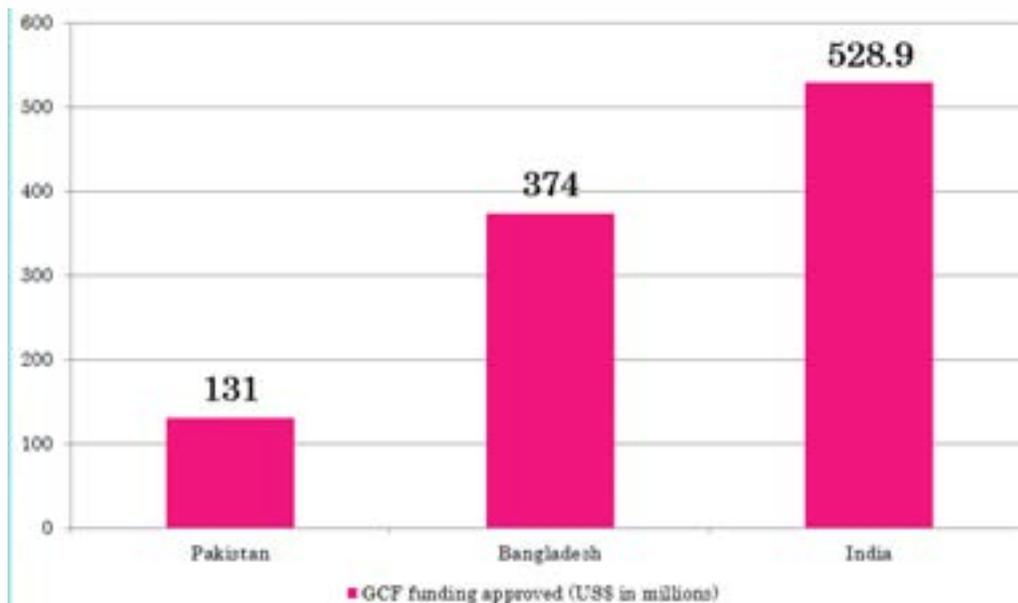
threaten Pakistan's water security, particularly in KPK.

#### • Recommendations

- A concerted effort is needed to have an accord with Afghanistan on the flow of Kabul River similar to that of Indus Water Treaty with India, in the light of upper and lower riparian rights for better management of water and to avoid overall deficiency in future.
- Kabul government must be provided with alternative energy projects in order to restore the natural flow of water via the demolition of excessive dams on Kabul River.
- Increasing mutual trade and ease in Trade Transit Restrictions may expedite the diplomatic process on establishing accords over Kabul River.

### ► Climate Finance

- Pakistan has been advocating its case at the forum of UN Framework Convention on Climate Change (UNFCCC) in line with the Convention's basic principle of 'common but differentiated responsibilities and respective capabilities (CBDR&RC)' and polluters pay principle. Pakistan's recent success during the 27th meeting of the Conference of Parties to the UNFCCC (COP-27) included approval of a separate fund for Loss & Damage.
- Experts, while appreciating Pakistan's climate diplomacy, noted that country's performance to mobilize funding for climate change mitigation and adaptation projects from the already existing climate finance global windows, particularly the multibillion-dollar Green Climate Fund (GCF), remained very less. By the end of year 2022, Pakistan availed only US\$ 131 million from GCF as compared to the US\$ 374 of Bangladesh and US\$ 528.9 of India.
- It has been observed that no specialized institutions are in place in the country to tap global climate finance and technological



support despite provision of establishment of Pakistan Climate Change Authority and a Climate Change Fund under the Pakistan Climate Change Act promulgated back in 2017. At present, Pakistan completely relies on the assistance from international NGOs and development partners to prepare and submit its concept notes and project proposals to mobilize global climate finance.

- There is a serious lack of awareness and understanding about carbon credits and how Pakistan can exploit them. There is lack of capacity building in climate finance mobilization including effective use of carbon credits and other international climate change leverages.
- Way Forward. Due to the considerable financial resources required to mitigate the negative consequences and adapt to a changing climate, climate finance is equally vital for adaptation. Collaborating with multilateral/bilateral development financial institutions (DFIs) to finance the climate change projects is the key to successful implementation of policies.

• **Recommendations**

- Three specialized project development units

to be immediately established; one each at MoCC, Pakistan Planning and Management Institute (PPMI) and National Disaster Risk Management Fund (NDRMF). The units will develop need-based concept notes and project proposals, particularly, to tap international climate finance windows to which Pakistan is entitled.

- MoCC should notify guidelines/ regulations for the public and private project proponents for prompt access to the international climate finance windows. The Ministry should ensure transparency and ease of doing business.
- Funding for the proposed actions in this paper should initially be located from the international climate finance windows to which Pakistan is entitled.
- Gender sensitive approach should be strictly observed in line with national gender action plans. AEDB in collaboration with PPIB should undertake enhanced and additional actions to proliferate renewable energy technologies in line with NDCs. Enhancing impactful climate finance allocations by effectively mobilizing public, private, and international climate finance.
- Ministry of Planning, Development and



Special Initiatives (M/o PD&SI) to also devise mechanism to prioritize budget allocations to the projects and infrastructure designs having exceptional climate change mitigation and adaptation impacts and vice versa.

- There should be climate finance section indigenously inside all federal and provincial ministries/departments which should be well equipped to develop national or provincial level project proposals based on needs assessment for an internationally competitive climate finance arena.
- Expertise should be achieved in obtaining Carbon Credits in order to have the maximum benefit of this climate financing opportunity.
- Climate resilient infrastructure, particularly, during the rehabilitation process in flood hit areas was considered of prime importance. Building back better will only be possible if we climate proof all our investments in development sector.

## ► Capacity Building

- **Gap between Policy and Implementation.** Pakistan is having challenges regarding legislation and enactment to implementation of already existing policies. In this regard, the delays in establishment of governing bodies

already approved by the government through Climate Change act is an apt example. Political instability and lack of consistency has also influenced the process of formation and implementation of these bodies, as nobody is ready to take political ownership and there is difference of interests in ministry and authority.

### • Recommendations

- Strengthening of the Federal Ministry of Climate Change, Federal Environmental Protection Agency as well as provincial ministries and departments of environment such as the Ministries of Energy; Water Resources; Food Security; the AEDB, the NDMA, provincial DMAs is important to develop adaptation and mitigation strategies for Pakistan. An effective coordination mechanism as per Rules of Business is required to be revitalized. MoCC to coordinate all the recommended actions and to biannually hold national stock-take conference to present the actions undertaken, gaps identified, and forging practical way forward. First national stock-tack conference on climate conference to be held in June, 2023. The conference will be open to all stakeholders, national and international development partners as well as general public.
- Build capacity of the existing line institutions and establish specialized smart institutions. MoCC to devise and execute a comprehensive capacity building plan for all stakeholder, public as well as private sector, on all contours of the climate change like decoding decisions of the international climate treaties towards action, climate finance, technology transfer, thus paving way for enhanced climate action in the country. The capacity building initiative will be a permanent feature of the Ministry. However, first phase to be completed during the year 2023-2024.
- The restructuring of Federal Flood Commission (FFC) into a vibrant and exclusive Flood Management Authority is earnestly suggested to work at national level to deal with flood protection planning and management



issues in a more coherent, inclusive, & well-coordinated manner and to also cater for issues related to urban/rain-caused flooding and for all water related adaptation measures.

- **Pakistan Climate Change Authority.**

Internationally, Climate Acts contribute significantly in advancing countries' climate change resolve. Despite the passing of the Climate Change Act 2017, the formation of Climate Change Authority (PCCA), and Climate Change Fund still seems an uphill task. Since its inception through the said Act, the first meeting of the Pakistan Climate Change Council (PCCC) was convened on 18 October, 2022 at PM house despite clear mandate that it will be held minimum twice a year.

- **Recommendations**

- Operationalization of the National Climate Change Act adopted by the Parliament in 2017 providing for establishment of a robust institutional architecture for addressing climate change issues is the need of the hour. Pakistan Climate Change Authority can serve as the main mechanism for the entire spectrum of climate change related activities, including the revision of the country's NDCs and projects submitted for funding by multilateral agencies and funds which will mobilize

resources and disburse funds for climate related actions.

- There should be regular meetings of the Climate Change Council as well as formulated Authority to supervise, and monitor the climate mitigation and adaptation initiatives going on at National level.

► **Lack of Integration of Climate Change into Development Sector.**

- There is a discrepancy in the government and private sector in the domain of climate change mitigation and adaptation at national level. A serious lag is present when it comes to project planning, assessment and execution at public and private level which should be addressed in order to harness the full potential of project success. Projects often do not include the inputs from important segments such as Practitioners, research community, and Public- Private Organizations working in the same domain.

- **Recommendations**

- that Joint ventures should be enhanced with private sector climate change organization, researchers, practitioners and investors in order to harness the full potential of project planning and execution at federal as well as provincial level.

► **Building Resilience of the Communities and Gender.**

- There exists a lack of awareness about Climate Change and its hazardous effects in local communities. Women are often ignored in this regard and it is believed that they contribute the least to the overall climate entropy.

- **Recommendations**

- Empower local communities particularly women for effective climate response and making them more resilient to climate induced hazards.
- A bottom-up approach should be the hallmark



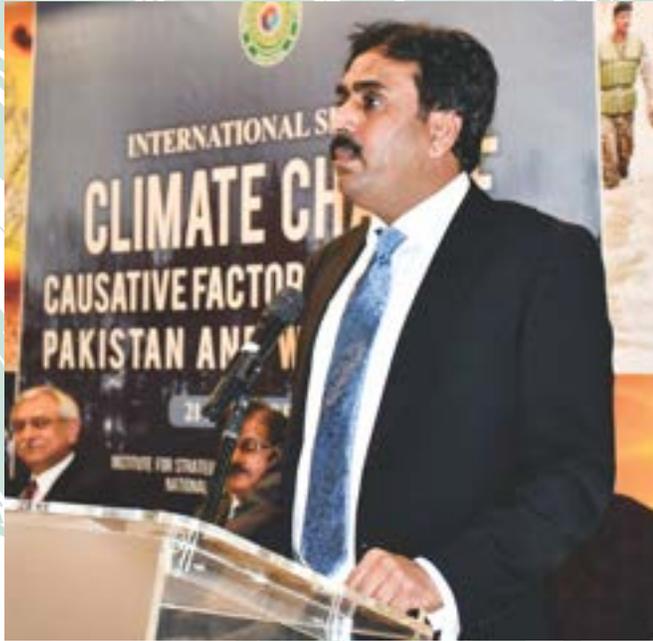
of all proposed actions. Wherein, vulnerable communities be engaged to the maximum extent. The actions should not be undertaken in silos or limited to the extent of big cities.

accurate feasibilities can be made before execution of all projects in the country. The world ranking will also be drastically altered once National Level Database has been fully developed.

## ► Climate Data and Outreach.

- The lack of indigenous, authentic, reliable and accessible data on climate change has hindered the development of timely and effective climate change policies. Currently, the ADB, WB, UNDP, German Watch and IPCC are considered reliable, but there is larger suspicion within Pakistan on the credibility of such indexes and data. The data prepared by international funding/implementation agencies sometimes disregard the domestic economic and capacity realities.
- **Recommendations**
  - Lack of reliable data is Pakistan's major issue that needs to be addressed at priority because it determines the country's position and ranking in various facets of climate change indices. National climate change database should be readily available to all the federal, provincial as well as open sources so that

- Stock-take available expertise, gaps, and needs of Global Change Impact Studies Centre (GCISC) and Pakistan Meteorological Department (PMD) and build their capacity to make them state of the art and impactful institutions.
- Dissemination of easy to comprehend climate information to the end users jointly by GCISC and PMD in collaboration with Ministry of IT and Ministry of Information and Broadcasting be ensured.
- MoCC should issue regulations for mandatory data reporting by the industry, business, and other polluters.
- Pakistan Bureau of Statistics (PBS) be strengthened in terms of becoming climate data repository and provide data to end user with authenticity and transparency for research and outreach purposes.



increased devastation manifolds.

- Lack of infrastructural planning and impact assessment before approving mega projects have caused much damage during extreme calamities.

- **Recommendations**

- Diamir-Bhasha and Kalabagh dam should top the list of priority projects.
- Authorities need to emphasize their concern for the built quality of infrastructures as the construction quality would be as important as the design itself. Pakistan Environmental Protection Agency and line provincial departments to amend environmental impact assessment (EIA/IEE) regulation by adding climate impact assessment and climate resilience of all private and public sector projects at project inception stage.
- Ministry of Planning Development and Special Initiatives (M/o PD&SI) and line provincial departments to amend project proforma (PC-I) by adding climate impact assessment and climate resilience of the development project at project planning stage.
- Illegal construction should be strictly monitored. Law of encroachment should be implemented to avoid loss of human lives in case of a disaster. Local law enforcement agencies and encroachment departments should be accountable in this regard.
- The 2022 flood reconstruction and rehabilitation process need to wholly embrace the approach of “Building Back Better” to reduce the cost and impact of the extreme events expected from future climate change.

## ► Correct Infrastructural Development Priorities

- Extreme weather events and aggravated climate crisis has unveiled Pakistan's administrative weaknesses to deal with the crisis. Non construction / politicization of large reservoirs, delayed actions and non-provision of early warning mechanisms has added to the problem. The non-implementation of National Flood Protection Program 2015, and bureaucratic mal-administration has also aggravated the crisis manifolds.
- The storage capacity of two mega dams of Pakistan at Tarbela and Mangla is falling because of silting and sedimentation. These mega dams can store only 30 days of average water demand compared to 120-220 days for India and 900 days for the US. According to the Indus River System Authority (IRSA), Pakistan receives around 145 million acre-feet (MAF) of water every year but can only save 13.7 MAF. Pakistan is unable to store additional water received during monsoon season particularly flowing through Swat and Kabul rivers. The phenomenon of heavy floods is occurring now with regular intervals due to change in rain patterns in the north and over all climate change.
- Similarly, non-implementation of KPK River act 2014, and encroachment into river bed has

## ► Inter-Ministerial and Inter- Provincial Coordination Committee

- Devolution of Powers/Authorities after the 18th Amendment. After 18th amendment, the climate change became a provincial subject,



with each province having environment departments operating under the provincial government. Whereas the National Disaster Management Authority (NDMA) remained under federal government. Since then, there has been problems prevailing related to unified policy making and implementation and regarding climate change adaptation and mitigation at national level.

### ► Disjoint between Research Departments and Government Bodies.

- There is a disjoint between the research departments and relevant federal and provincial ministries/departments regarding transfer of technology, innovation and research hence new research is unable to be utilized in practical sense at any level.
- Way Forward. Poor coordination among federal and provincial departments has been the frontline issue for climate change adaptation and mitigation at national level.
- **Recommendations**
  - Climate Change should be a federal subject to avoid lack of coordination between provinces on issues relating to climate change like water distribution etc. This was evident when

Executive Committee of the National Economic Council (ECNEC) approved funds for Green Pakistan Program 2016-2022 (GPP) and the Ministry of Climate Change was unable to effectively implement the program, due to lack of authority heads and dispersed correspondents .

- Duplication of research be avoided as it is a waste of time and resources in all provinces of the country. A centralized body supervising the research projects should be made within MoCC to act as a bridge between government and research departments so that the research outcomes can be utilized in local setting all across the country.
- Effective implementation of global climate change regime at national level is hindered due to lack of integration in Climate Change relevant departments of government at federal and provincial level. Fulfilment of International climate change commitments would require close co-ordination across government agencies.

### Mitigation

- Climate change mitigation, as the name suggests, refers to the avoidance or reduction in the green-house-gas (GHG) emissions by any means possible. The mitigation process is



motivated by the future prevention of global temperature rise. Mitigation processes may involve either the reduction in sources of major GHG emitters (such as the limiting the use of carbon emission technologies) or installation of 'carbon sinks' (such as tree plantation). Currently, there are a plethora of mitigation challenges in Pakistan, including increased deforestation (due to both; agricultural purposes & climate change), lack of catalytic converter in automobiles and transport industry and the lack of provision of alternative renewable energy resources that stress the definite supply of fossil fuels.

### ► **Nationally Determined Contributions (NDC)**

- Pakistan has joined global efforts to contain global warming by committing to cut GHG emissions and helping operationalize the 2015 Paris Agreement. According to NDCs report in 2021 for the UN Climate Change Conference COP26 in Glasgow, Pakistan set an ambitious cumulative GHG reduction target of 50 percent below its projected 2030 emissions, and transition to 30 % electric vehicles and 60% conversion to Renewable energy which seems ambitious and unrealistic as no physical measures or steps have been taken so far in the practical sense.

### • **Recommendations**

- The NDCs determined should be realistic and based on active implementation of policies. They should focus on achievable short term as well as long term goals with clearly demarcated timeline.
- Transparency and progress of the fulfillment of those NDCs should be ensured at all levels. Various steps to reduce or absorb GHG emissions are discussed in succeeding paragraphs.

### ► **Afforestation (A step to reduce GHG emissions)**

- Natural sinks allow the CO<sub>2</sub> to be adsorbed in them hence mitigate the hazardous effects of GHG for environment. These sinks include forests, soil and oceans. Conservation of these natural sinks is very crucial to mitigate the effects of GHG. According to World Bank Statistics, Pakistan has 4.8 percent area under forest cover. The inadequate forest cover area due to growing population and dependence on the natural resources coupled with deforestation has rendered the country one of the most vulnerable to climate change effects. As a result, natural resources are under tremendous pressure owing to change of land use, habitat destruction and consumption of fuel wood and timber extraction. Following is recommended: -

- **Recommendations**

- Afforestation is the ultimate solution to reduce the greenhouse gas emissions (Carbon sink). Projects already undertaken by the government at federal as well as provincial level should be enhanced and yearly nationwide afforestation drive should be planned and promoted at educational, corporate and civil / military institutions.
- National Forest Policy 2015, programs like Clean Green Pakistan and "Ten Billion Tree Tsunami" should be implemented nationwide with transparency and accountability.

### ► Transport Sector

- Transport sector is becoming another factor in deteriorating the climatic conditions. With the anticipated rise in Fossil Fuel Vehicles (FFVs), the problem of GHG emissions is only going to get worse.

- **Recommendations**

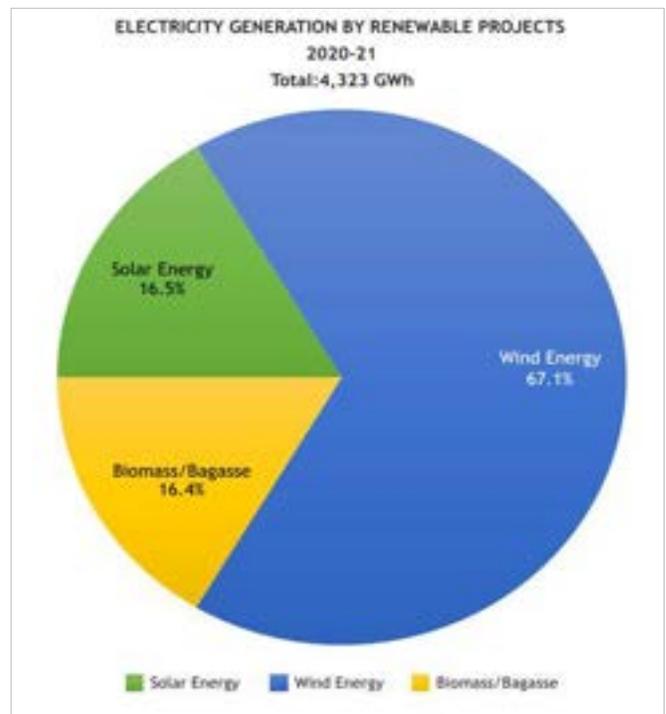
- EVs do not emit any pollutants so their introduction will limit emissions to a large extent. Electric Vehicle Policy- 2019 should be adopted and conducive and affordable arrangements should be made for adopting electric or Hybrid vehicles at public as well as government level. Make all efforts to achieve milestones promised in our NDCs with regards to EVs (30% Vehicles on electricity by 2030).
- Public transport should be made high quality, affordable, accessible and comfortable enough for the general masses to adopt at daily basis to cut off major carbon emissions from vehicles burning fossil fuels. Encourage mass transit mechanisms.
- Vehicles should be smoke free. Testing of the vehicles should be religiously ensured at district level before they come on the road and penalized through traffic police for smoke emission.

### ► Alternative and Renewable Energy.

- According to National Electric Power Regulatory Authority's (NEPRA) 2021 yearly report, Pakistan's total installed power generation capacity is 39772 MW, of which 63% of energy comes from thermal (fossil fuels), 25% from hydro, and 5.4% from renewable (wind, solar and biomass) and 6.5% from nuclear. In the current scenario, renewable energy (RE) resources can play an important role in closing the deficit. According to the revised Renewable Energy Policy 2019, Government of Pakistan aims to derive 60 percent of energy from renewable sources including hydro by 2030 that would wean Pakistan's dependence on imported fuel products.

- **Recommendations**

- Shifting to Alternative and Renewable Energy is the need of the time. The Alternate and Renewable Energy Policy (ARE 2019) lists, among other things, alternative renewable energy technologies, such as geothermal energy, hydrogen, synthetic gas (produced from sources other than fossil fuels), solar power and on-shore and off-shore wind energy. In addition to Wind, and Solar, we need to focus on latest technologies which





can help us generate energy through geothermal, hydrogen and synthetic gas.

- Currently, initiatives have been taken towards the provision of alternative energy, such as the 2021 Green Hydrogen Plant Initiative adopted for Sindh and the 2022 memorandum on the installation of Geothermal Power Plant (GPP) (with the help of Chinese investment) . However, there is currently no developments

in terms of synthetic gas production in Pakistan.

- Alternative Energy Development Board (AEDB), in collaboration with Private Power and Infrastructure Board (PPIB) and NEECA should undertake enhanced and additional actions to proliferate renewable energy technologies in line with NDCs as submitted by the Government of Pakistan to United Nations.

## ► Biomass Energy

- Waste generation and the related emissions from waste are expected to increase as Pakistan undergoes rapid urbanization. Biomass/waste technology is an opportunity and can generate clean energy out of waste in specially designed power plants and can also improve solid waste management conditions in urban areas.

## • Recommendations

- Bio-energy generation and greenhouse-gases mitigation through organic-waste utilization should be encouraged in urban centers like Karachi and Lahore.



- Depending on the composition of waste material, power plants can be designed with the capacity to process 1-1500 tons/day of hospital waste, municipal solid waste, industrial effluents, industrial waste, mixed waste plus tires, mixed waste plus dried sewage sludge, and crop and biomass residues. In addition to power generation, the plants can also produce high-grade organic fertilizer.

## ► Thar Coal Project

- Pakistan has successfully launched a third power plant with the capacity of 330 megawatts on the indigenous Thar coal in Tharparker, helping the country to produce electricity at a significantly lower cost, cutting energy import bills and saving foreign exchange reserves. Accordingly, the total installed power production capacity increased to 990 megawatts on Thar coal in three-years to date. Pakistan has 175 billion tons of coal reserves in Tharparker alone, equivalent to 50 billion tons of oil equivalent (TOE) which is more than Saudi Arabian and Iranian oil reserves. The reserves equal 2,000 8trillion cubic feet (TCF) of gas which is 68 times higher than Pakistan's total gas reserves. Thar coal can meet Pakistan's electricity demand for several centuries and, as all the coal reserves will not be utilized for power production, there could be many other uses and opportunities for the excess coal. However, a challenge remains for Pakistan in terms of peer pressure and

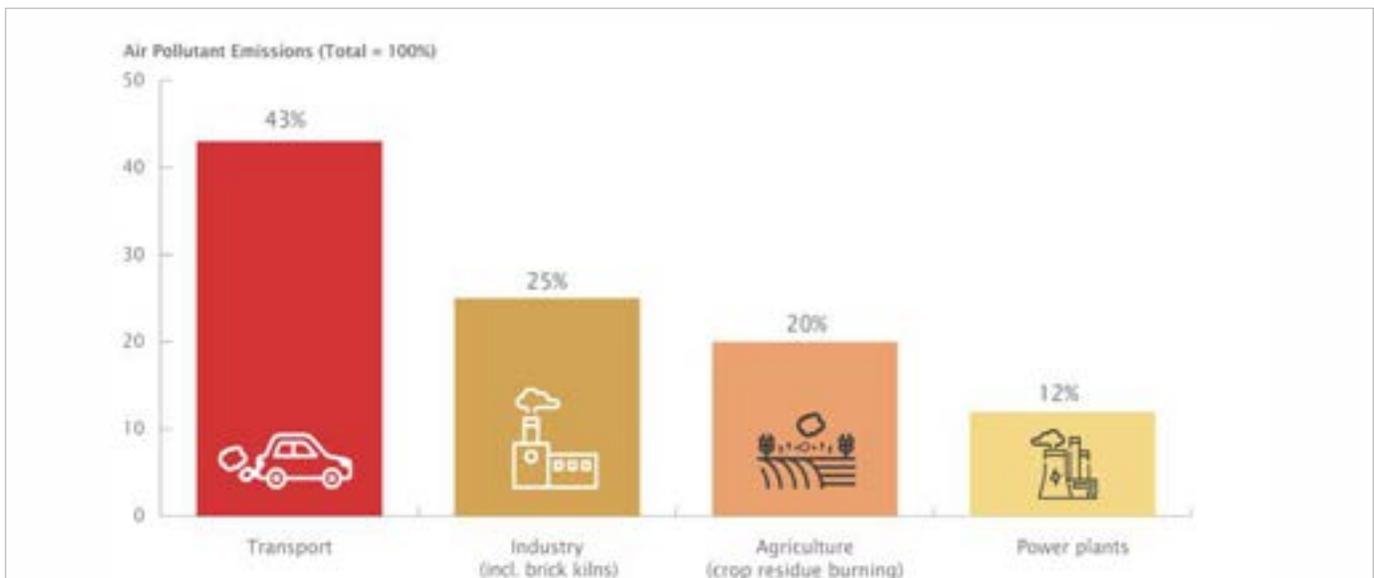
international condescension over the use of coal. This is because the international society has progressed in climate friendly technology and the usage of coal shall oppose such global initiatives of climate change mitigation.

### • Recommendations

- Thar coal project should be continued with full potential as the project promises huge energy generation. There is no need to be apologetic about it as Pakistan is already a low emitter of GHGs. Its coal plants are relatively new than big emitter countries.
- However, new technology which can mitigate the harmful effects of coal power plants should be fully incorporated as a long-term measure to prevent GHG resulting from direct burning of coal.

## ► Air Pollution

- **Crop Burning.** For three weeks in October-November, farmers in the Pakistani and Indian Punjab provinces resort to stubble burning of the harvested rice crop to prepare the fields for wheat sowing. Due to wind direction, smoke generated in Indian Punjab also joins with smoke generated in Pakistan. Due to this and also because of low-grade fuel, industrial emissions, and dust particles, many cities in Punjab experience a sharp deterioration in air quality. Lahore, with a population of more than





10 million people, now ranks amongst the most polluted cities in the world while Pakistan came third in the list of the most polluted countries in 2021. Studies show that transportation, industry, and power generation sectors contribute 80% of Punjab's air pollutants. The National Commission for Human Rights reported that on average, the four winter months dominated by smog reduce the average lifespan of Lahore's citizens by 2.7 years. Furthermore, an increased harmful emission of fine particulate matter is causing severe air pollution hazards, inflicting individual health and financial problems.

- **Recommendations**

- One known technology for eliminating stubble burning is the 'happy seeder' which breaks down rice stubble (mulching it to the ground), and plants wheat seeds simultaneously.
- Options to subsidize this technology to make it financially viable for the farmers, incorporate a premium price for farmers if they commit to non-burning, or approaching environmental organizations (such as The Nature Conservatory) to

fund crop stubble burning abatement can be explored.

- The rice stubble can be used in creating garden mulch, composting, and fodder in dry times and bedding for livestock. It provides efficient insulation and can be compressed into blocks/bales or used in combination of other materials for construction of insulated building structures
- **Brick Kilns.** Each year near winter, the Punjab government 'cracks down' against brick kilns, industries and vehicles emitting excessive smoke by imposing hefty fines. However, this is often seen as an ineffective measure which fails to address the root cause of the issue. Often times, many industry owners go undetected or continue emitting hazardous smoke after paying the fines.

- **Recommendations**

- The government needs to ensure that Kilns are not built alongside residential areas and existing kilns located close by are either

moved elsewhere in the long term or monitored to ensure that they effectively manage their air emissions.

- National standards for Kiln industry emissions need to be revised and the industry must assure their compliance. Zig-zag technology, stacking the bricks in a zig-zag pattern instead of straight line should be encouraged for adoption. This method changes the way coal is loaded to redirect the air flow, and also leads to better, more efficient fuel combustion and increases energy efficiency.

- **Low Quality Fuel.** The fuel Pakistan uses falls under the Euro 2 category of the European Union standards, a significantly lower-quality fuel compared to the Euro 5 category adopted by high income countries. Although the governments have made attempts to switch to a more environment friendly fuel, this is yet to happen. Failure of regulation and control of these emissions result in an unhealthy increase in smoke and poisonous gases which when combine with fog during winter months, result in hazardous smog.

- **Recommendations**

- Government should force car manufacturers to install Catalytic converters into their vehicles to reduce the Carbon emission. Until electric vehicles hit the road, installing catalytic converters in automobiles is necessary, as catalytic converters tend to reduce harmful gas emissions by 90% . This device is important as it greatly reduces the emissions of a car. All EURO II standard cars in Pakistan come along with a catalytic converter.
- We also need to replace Euro-2 fuel standards of automobiles with Euro-5, since both fuels cost roughly the same, whereas Euro 5 has higher fuel average and less harmful emissions besides improving the fuel quality.
- **Climate Resilient City Planning.** Cities also account for a large share of CO2 emissions from energy use, transport, industry, and waste.

They contribute significantly to air pollution, posing significant health and productivity threats to urban dwellers. Urban extension, the absence of green spaces, and the poor state of basic services accentuate people's vulnerability to shocks if, and when, they occur. Rapid urbanization puts stress on municipal services, which are critical to strengthening the resilience of vulnerable urban communities. Most cities in Pakistan lack the fiscal resources, governance, and institutional capacity to invest in much-needed infrastructure and services.

- **Recommendations**

- Pakistani cities will need to undergo a transformation to become livable and climate-resilient spaces and fulfil their role as catalysts of inclusive growth.
- Measures to strengthen climate resilience need to be an integral part of city investment and management.
- Improving planning, service delivery, and municipal finance is essential to set cities on a resilient, low-carbon, sustainable growth trajectory.
- Climate resilient infrastructure, particularly, in the context of 2022 flood damages rehabilitation/reconstruction shall be a viable option to secure future investments in the development sector. The 2022 flood reconstruction and rehabilitation process need to wholly embrace the approach of "Building Back Better" to reduce the cost and impact of the extreme events expected from future climate change. Key to this will be action to resolve the fundamental structural problems cities face. Recently launched 4RF (Resilient, Recovery, Rehabilitation & Reconstruction) Framework Report is the Government of Pakistan's strategic policy and prioritization document which will guide the recovery, rehabilitation and reconstruction of the country. Speedy implementation of this strategy is the need of time.





**PART – III**  
**CONCLUSION**



- The extreme climate change induced events will be more frequent in the foreseeable future. They will affect vulnerable communities with increased frequency and severity as they lag the capacity to mitigate and adapt to these threats in the present situation. Pakistan is no exception, as the country is already repeatedly experiencing the brunt of climate disasters and catastrophes since many years. On the domestic front, nature and community based solutions and decision-making are needed to drive sustainable and resilient environmental change and build a capacity to cope with the adverse effects of climate change. Mitigation and adaptation must be pursued simultaneously in this regard. Adaptation, however, the process of learning to cope and adjust in the face of climate change should be our prime priority, as it promises to make communities resilient and enables them to face minimal damage by proper planning and execution of adaptation techniques. On the international front, effective capacity building in climate finance is the need of hour as large projects targeting mitigation as well as adaptation cannot be implemented by developing countries alone. Pakistan's National Climate Change Policy 2021 is a benchmark for its commitment to Climate change resilience and adaptation which if implemented in true letter and spirit can enable the country to cope with the extremities in a better way in order to avoid the human and material loss in future. Effective and consistent actions taken by community, public and private organizations and civil society will add up to a significant impact and change. To cope with an issue as complex and urgent as climate change, everyone contribute now or else it will be too late.



The background is a dark, moody photograph of a forest. The trees are silhouetted against a slightly lighter, hazy sky. In the bottom-left corner, there is a large, solid red curved shape that partially obscures the forest floor. The overall color palette is dark, with shades of blue, grey, and black, punctuated by the bright red in the foreground.

# ANNEX

## Climate Change Related Policies and Initiatives in Pakistan

S.no	Policy Title	Date	Primary Focus
1.	National Resettlement Policy	March 25, 2002	Policy Framework for Land Acquisition, Resettlement and Rehabilitation of Affected Persons
2.	National Environmental Policy	August 25, 2005	Protection, conservation, rehabilitation and improvement of environment, for the prevention and control of pollution, and promotion of sustainable development
3.	National Drinking Water Policy	September 30, 2009	Increasing Access, Protection and Conservation of Water Resources, Water Treatment and Safety
4.	National Rangeland Policy	January 30, 2010	Rehabilitate the degraded rangelands and pastures, increase and conserve rangeland biodiversity and contribute to the livelihood improvement of the rangelands dependent communities
5.	National Sanitation Policy	August 30, 2012	The National Sanitation Policy envisions creation of an open defecation free environment with country wide safe disposal of liquid and solid waste
6.	National Climate Change Policy 2012	September 03, 2012	Vulnerabilities to climate change in the sectors of water resources, agriculture, forestry, coastal areas, biodiversity and vulnerable ecosystems and appropriate adaptation measures to be adopted.
7.	National Forest Policy	January 27, 2016	Expansion of national coverage of forests, protected areas, natural habitats and green areas for restoration of ecological functions and maximizing economic benefits while meeting Pakistan's obligations to international agreements related to forests
8.	National Electric Vehicle (EV) Policy (2019)	July 19, 2021	Encourage auto and related industry to adopt vehicle manufacturing. Mitigate negative aspects of climate change through reduction in emissions from Transport sector through introduction of fuel efficient green technologies. Contribute to reduction of external deficit through reduction in overall share of oil import bill by shifting to EVs
9.	Final Updated National Climate Change Policy-2021	March 18, 2022	Steer Pakistan towards climate resilient and low carbon development. Disaster preparedness, capacity building, institutional strengthening; technology transfer and international cooperation have also been incorporated

10.	National Hazardous Waste Management Policy 2022	July 25, 2022	Prevent, minimize and control hazardous waste being generated in the country, To control the trans boundary movements of hazardous waste and To build capacity of all relevant stakeholders for Environmentally Sound Management of hazardous waste in Pakistan.
11.	National Water Policy	April, 2018	Integrated Water Resources Management
12.	Alternative and Renewable Energy Policy	2019	Covers all projects to be implemented with Alternative or Renewable Energy technologies for producing power whether for sale to a public utility
13.	National food security policy	2018	
14.	National Adaptation Plan (Technology Needs Assessment For Climate Change Adaptation Technology Action Plan & Project Ideas)	In- Progress in collaboration with UNEP and Green Climate Fund	Adapting to climate change impacts and building resilience against disasters.
15.	Clean Green Pakistan Index	2019- ongoing	Safe drinking water, solid waste management, liquid waste management/hygiene, plantation, and total sanitation in cities/tehsils
16.	WASH (Water, Sanitation and Hygiene)	2019- 2023	Improve the quality of water supply and ensure access to safe drinking water to nine percent of the population deprived of it

#### National Adaptation Plan (Planned Initiatives)

1.	Eco-system Restoration Initiative	2019-2030	Revive forest and wildlife resources in Pakistan
2.	Protected Areas Initiative	2020-23	To facilitate the promotion and development of key wildlife habitats across major national parks of Pakistan for conservation and ecotourism purposes.
3.	Reduced Emissions from Deforestation and forest Degradation-Payments for Environmental Services (REDD+PES)	2020-49	Conservation of existing forest carbon stocks, sustainable forest management and enhancement of forest carbon stocks
4.	Miyawaki Forests	2019-ongoing	Increasing Forest cover by Japanese Technique
5.	Recharge Pakistan	2019-in pipeline	Increase water storage and recharge through wetlands, floodplains, and hill-torrents management; promote climate-adapted community-based natural resource management and livelihoods

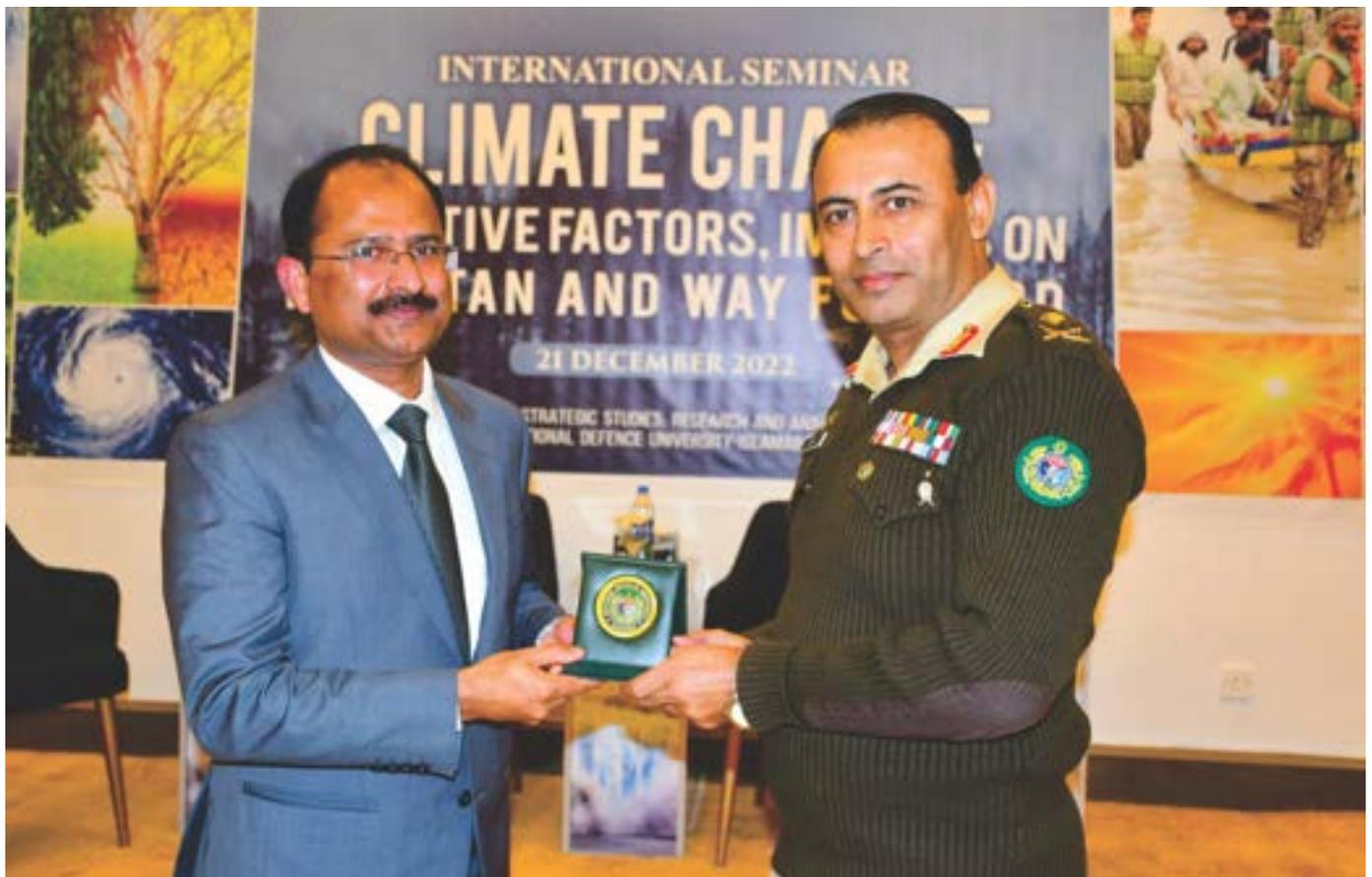
6.	Ten Billion Tree Tsunami Programme	On- Going	Increasing Forest Cover Nation wide
7.	Transforming the Indus Basin with Climate Resilient Agriculture and Water Management	2019-26	Transforming the Indus Basin with climate resilient agriculture and water management
8.	Sustainable Land Management Project (SLMP Phase II)	2015-21	Combat Desertification in Pakistan
9.	Sustainable Forest Management (SFM)	2016-21	Sustainable forest management in Pakistan's west Himalayan coniferous forests, scrub forests and riverine forests for biodiversity conservation, mitigation of climate change, and securing forest ecosystem services
10.	REDD+ Readiness Preparation Proposal (R-PP,)	2015-2021	The R-PP is a plan with budget and time schedule, which describes how the country can make themselves ' REDD+ ready ' using the following elements: the development of a national REDD+ strategy. Specific policy development. a plan for involving and consulting stakeholders and strengthening their capabilities
11.	National Biodiversity Strategy and Action Plan (NBSAP)	2018	Achieving Aichi Biodiversity Targets and Sustainable Development Goals
12.	REDD+ Indus delta (Delta Blue Carbon Phase I)	2019-2030	The protection, restoration and sustainable management of Tidal Wetlands on the south-east coast of Sindh
13.	Restoring mangrove forests	1990-ongoing	Restoration and conservation of Coastal mangrove forests
14.	Community Infrastructure (GLOF-II)	2017- 22	Empower communities to identify and manage risks associated with GLOFs and related impacts of climate change, strengthen public services to lower the risk of disasters related to GLOF, and improve community preparedness and disaster response





**PICTURE GALLERY**















# THE TEAM





**INSTITUTE FOR STRATEGIC STUDIES, RESEARCH AND ANALYSIS (ISSRA)  
NATIONAL DEFENCE UNIVERSITY-ISLAMABAD**