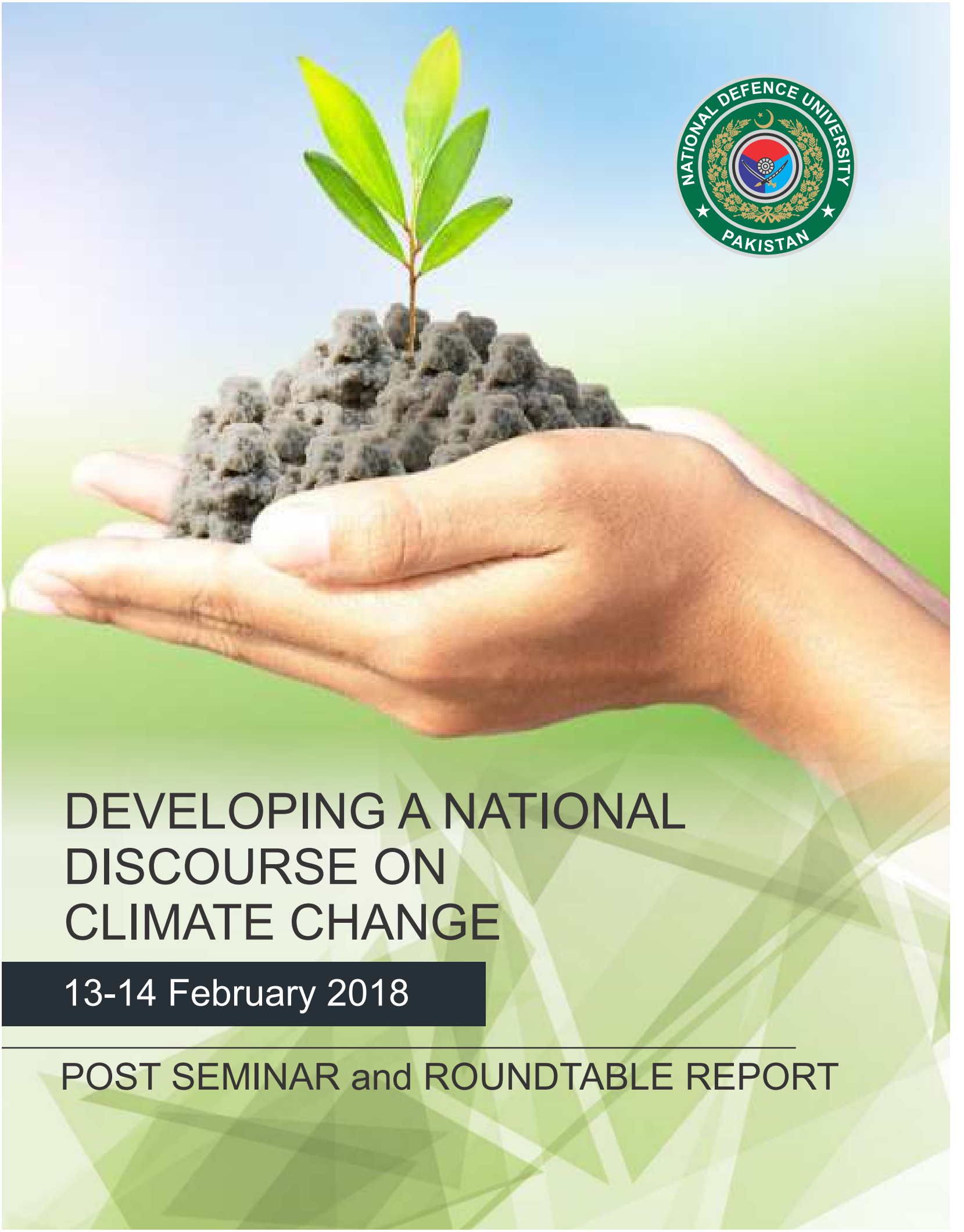


DEVELOPING A NATIONAL DISCOURSE ON CLIMATE CHANGE

13-14 February 2018

POST SEMINAR and ROUNDTABLE REPORT

PSR Supervised by
Brig. Masroor Ahmed (Retd)
Director Defence Studies Branch
ISSRA

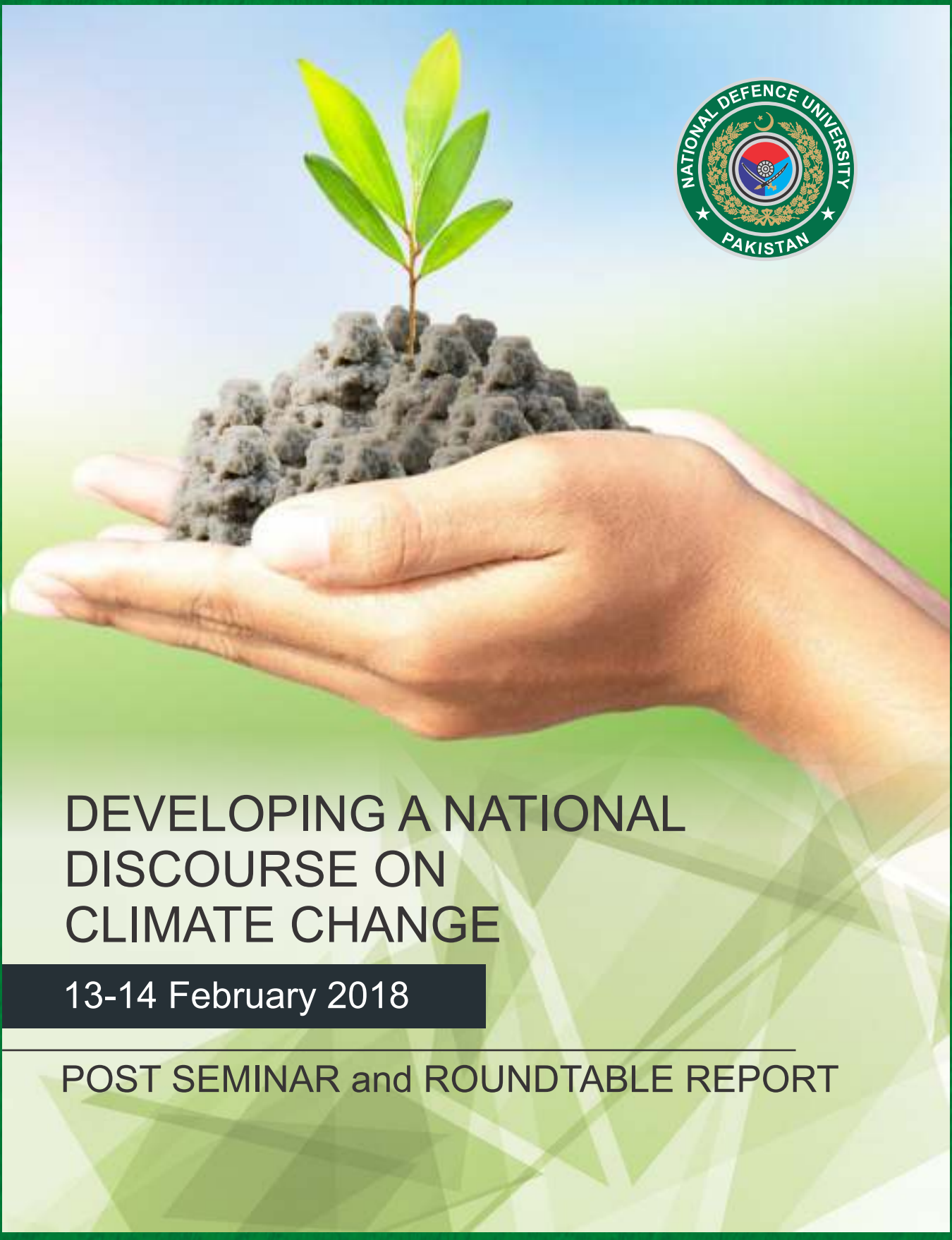
Editorial Team
Ms. Fatima Saleem
Ms. Iffat Pervaiz
Mr. Hussain Rizvi

Graphics Designer:
Zahid Khattak, Aftab Mirza

Composed by:
Azam Khan

Publication by:
Defence Studies Branch, ISSRA
National Defence University (NDU), Islamabad
E-mail: dirdsissra@ndu.edu.pk

This compilation is based on inputs by a team of rapporteurs: Research Associates and Research Fellows in the order, Ms. Khadija Younis, Mr. Muhammad Shabbir, Ms. Beenish Sultan,
Ms. Mariam Akhtar, Ms. Afifa Kiran, Ms. Iffat Pervaiz, Ms. Fatima Saleem, Mr. Omer Baloch and Mr. Abdul Rauf.



DEVELOPING A NATIONAL DISCOURSE ON CLIMATE CHANGE

13-14 February 2018

POST SEMINAR and ROUNDTABLE REPORT

CONTENTS

An Overview of the Seminar
Executive Summary

Session-I
International and National Dimensions of Climate Change

Session-II
Reshaping the Security Landscape: Impact on Energy, Food and Water Resources of Pakistan and Beyond

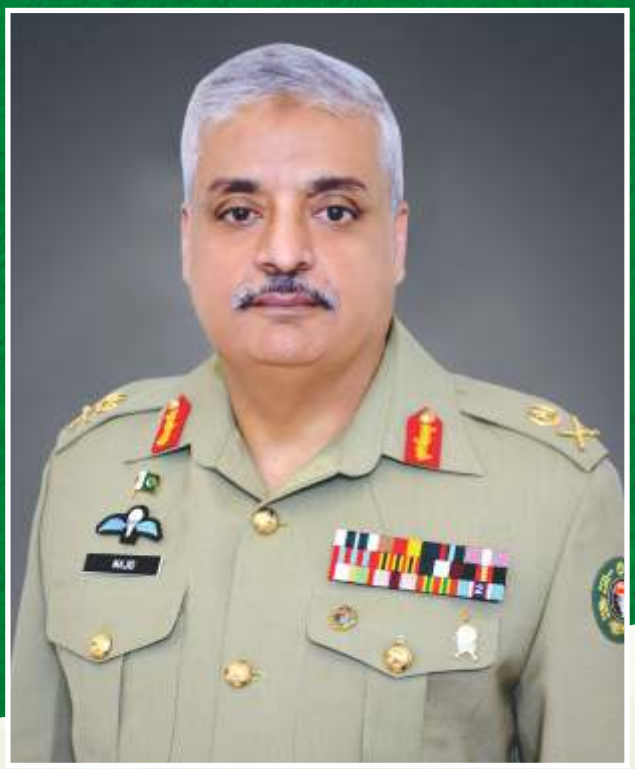
Session-III
Challenges for the Security of Pakistan

Closing Session

Roundtable

Photo Gallery

Foreword



The changing climate pattern is one of the greatest challenges facing humanity, with implications on health, agriculture, economy, trade, transportation and energy infrastructure. Studies suggest that Climate Change will create economic costs at both individual and sectoral level, but developing countries will suffer the most. This is due to many factors, including the economic importance of climate-sensitive sectors for these countries (e.g. agriculture) and the limited financial and human capacity to respond to the impacts of climate change.

The National Seminar,"Developing a National Discourse on Climate Change", followed by a Roundtable on the same topic, conducted by Institute of Strategic Studies, Research and Analysis (ISSRA) under NDU provided an opportunity for representatives of all spheres to get under one roof and discuss and develop the country's national discourse keeping in view the traditional and non-traditional threats which are associated with Climate Change.

Pakistan potentially faces a major climate change challenge. It has been ranked high in several vulnerability indices, especially water, food and energy security and impacts on livelihood. In the last 50 years, the annual mean temperature in Pakistan has increased by roughly 0.5°C. The number of heat wave days per year has increased, annual precipitation patterns show variability, extreme weather events have become more common and Sea level along the Karachi coast is rising. This shows the heightened need to make efforts to control the threat before it gets too late.

Lt Gen Majid Ehsan HI (M)
President National Defence University

Preface

According to a report published by World Bank in 2006, Pakistan's water availability is heading towards less than 1000 cubic meter/y by 2035.This will have direct economic consequences for the country since water is essential for sustained economic growth especially for an agrarian economy like Pakistan's.

Unfortunately a lacking national discourse on Climate Change and the unawareness of the masses has aggravated the issue. With our politicians locked in self-centeredpowerstruggle, building widespread resilience against Climate Change is just not getting the attention it deserves. Bulk of the resources is wasted due to lack of defined policy goals and implementation measures. A growing number of analysts are rightly pointing out that Climate Change is the biggest existential threat for Pakistan, even more serious than the challenge of militancy. So is the critical need for evolving and updating strategies to focus on Climate Change and exploring newer avenues for cooperation.

The Seminar and Roundtable on “Developing a National Discourse on Climate Change” has proved to be another milestone in a series of exercises taken by intellectuals and thinkers of the country to provide an array of high quality input for thought provocation and stimulation amongst the policy makers. I extend my profound gratitude to Brigadier Masroor Ahmed (Retd), Director Defence Studies and his team on the successful organization of the Seminar and the Roundtable Discussion and compilation of this report.

Major General Muhammad Samrez Salik, HI (M)
Director General ISSRA

Overview of Guests

Mr. Mushahid ullah Khan, Federal Minister for Environment and Climate Change

The Federal Minister is the Central Vice President of PML (N) and Chief Coordinator PML (N) Karachi. He has been elected second time as Senator in Senate elections 2015 on general seat from Punjab Province for the term 2015-2021 and appointed as Member of Senate Standing Committees on:

- Ministry of Information Broadcasting and National Heritage
- Ministry of Federal Education and Professional Training
- Ministry of Information Technology and Telecommunication
- Ministry of Finance, Economic, Statistics and Privatization
- Ministry of National Food Security and Research

Lt Gen (Retd) Muzammil Hussain, Chairman WAPDA

Lt Gen (Retd) Muzammil Hussain joined the Army in 1976 and graduated with distinction from PMA. He has been employed on exalted positions, including his employment in Interior Sindh on anti-dacoit operations of 92 and Gulf War 1 in Saudi Arabia. He commanded 30 Corps Gujranwala and supported the successful conduct of 2013 election in Gujranwala Division. He is a regular speaker in seminars on Pakistan's successful transition to democracy and economic positive trajectory in Universities in the United Kingdom. He now resides in Islamabad. He assumed the charge of Chairman WAPDA on 24 August 2016.

Mr. Sartaj Aziz, Deputy Chairman Planning Commission

Mr. Aziz is a development economist and obtained a Masters' degree in development economics from Harvard University, USA in 1963. Mr. Aziz has written several books and articles. His most important contribution to development literature was his book on China, "Rural Development: Learning from China", which was published by Macmillan from London in 1978. His memoirs entitled "Between Dreams and Realities: Some Milestones in Pakistan's history", were published by the Oxford University Press in August 2009. From 2013 to 2017, Mr. Aziz worked as Prime Minister's Adviser on Foreign Affairs. Currently, he is serving as Deputy Chairman Planning Commission of Pakistan.

Overview of Speakers

Ms. Aisha Khan

Ms. Aisha Khan is the Executive Director for Civil Society Coalition for Climate Change (CSCCC) and CEO of Mountain and Glacier Protection Organization (MGPO) with responsibilities for management, policy planning, government relations, advocacy, capacity building and sustainability of programmatic activities at the national, sub national and international level. She has over 18 years' experience in development work, designing and implementing sustainable development programs.

Dr. Abid Qaiyum Suleri

He is an Executive Director of Sustainable Development Policy Institute since 2007. Currently, he is also serving as member of National Economic Advisory Council; member of Advisory Committee of National Planning Commission; and member of the National Advisory Committee jointly formed by Government of Pakistan and the USAID for Pakistan Strategic Support Program. Dr. Suleri has conducted intensive research on “Resilient Livelihoods”, “Food Insecurity”, “Regional Trade”, and “Political Economy of Development”. His other research interests include institutional reforms, non-traditional security threats, and energy governance.

Mr. Syed Abu Ahmed Akif

Having served as Secretary Ministry of Climate Change for about 23 months, he is presently posted as Secretary Ministry of Inter-Provincial Coordination, Government of Pakistan. Mr. Akif has extensive “field” work experience as an administrator heading the governance, law and order, and coordination functions

in Pakistan's federal and provincial secretariats. He has authored, edited and translated 12 books on political commentary, travel features, book reviews, and personal memoirs. Syed Abu Ahmed Akif has contributed several research articles in important journals and presented papers at international conferences.

Dr. Safdar A. Sohail

Dr. Sohail is currently the Director General, National Institute of Management, Islamabad, National School of Public Policy Government of Pakistan, with additional charge of Member Governance, Planning Commission, Islamabad. He has served as Executive Director General, Ministry of Commerce from February - August 2017. He has also been the Founding Executive Director CPEC Centre of Excellence of Planning Commission, Pakistan Institute of Development Economics from January 2016-February 2017. He has four publications, two electronic publications and ten research reports to his credit.

Ambassador Shafqat Kakakhel

After serving as a member of Pakistan's Foreign Service (1969-1998), Ambassador Kakakhel joined the UN in 1998 as Assistant Secretary General and Deputy Executive Director of United Nations Environment Program (UNEP). Since retirement and return to Pakistan, Kakakhel has been actively engaged in efforts to promote sustainable development and Climate Change policies. He serves on the governing panels of several official and civil society organizations. He has written and lectured extensively on Pakistan's environmental and water- related challenges.

Mr. Ali Tauqeer Sheikh

Mr. Ali Tauqeer Sheikh is the CEO of Leadership for Environment and Development (LEAD) Pakistan. He heads Climate Leaders Action Network which consists of over 2,000 eminent experts from across Asia, Africa and Latin America. Mr. Sheikh is deeply involved in various facets of sustainable

development, particularly in poverty-environment nexus, climate vulnerabilities and equitable development. He has served as advisor/consultant to many national/international organizations such as ADB, European Commission, UNDP, UNESCO and the USAID.

Dr. Shaheen Akhtar

Dr. Shaheen Akhtar is a Ph.D in International Relations. She is currently working as Associate Prof. in the Department of International Relations, Faculty of Contemporary Studies (FCS) at the National Defence University, Islamabad. She is a scholar with wide experience in research and teaching. Her area of interest is non-traditional security issues – water, energy and gender issues in particular; regional stability, conflict resolution and peace building with particular reference to Kashmir, and Sri Lanka. She is author of over sixty research articles that have been published in internationally abstracted journals and as book chapters.

Lt Gen Tariq Waseem Ghazi (Retd) HI (M)

Lieutenant General Tariq Waseem Ghazi is a retired military General Officer having the honour of leading an international United Nations Peacekeeping Mission in Georgia, drawing high acclaim from the Secretary General Mr. Kofi Annan. He has the unique privilege of being the Commandant of the two most prestigious military institutions in Pakistan: The Command and Staff College, Quetta and the National Defence University, Islamabad. Presently, he is lecturing at military institutions in Pakistan and abroad; participating in many track-2 diplomatic efforts, international dialogue processes and forums related to defence, regional security and Climate Change. He is also a member of the Global Military Advisory Council on Climate Change, Brussels.

Major General Asghar Nawaz (Retd)

Major General Asghar Nawaz is an Engineer by profession and has had an illustrious career of over 34

years in Pakistan Army. He has held the notable post of Chairman National Disaster Management Authority (NDMA). The General Officer was instrumental in transforming the Army's functioning in IT enabled environment to realize Chief of the Army Staff's IT Vision in most accomplished manner. The General Officer authored, for the first time, the Doctrine of Intelligence Surveillance and Reconnaissance (ISR) for Pakistan Army. He was granted COAS Commendation Card in1995 for his notable performance in Flood Relief Operations at Balochistan. He was conferred with the Medal of HI(M) by President of Pakistan in 2014 for his meritorious services in Army.

Dr. Qamar uz Zaman Chaudhry

Dr. Chaudhry is a climate scientist by profession and since 2003 associated with the UN-World Meteorological Organization, first as a Member of Executive Council and then Vice President of the Asia Region. From 1996-2010 he was Director General of Pakistan's Meteorological Department, and also served Government of Pakistan from 2010-2012 as Advisor on Climate Affairs. He has been involved in some of the most important international scientific reports and initiatives, including most recently as an expert reviewer of IPCC's SREX and AR5 reports and the World Bank's 'turn down the heat' report. He has contributed more than 60 research papers in national and international journals, and presented at major international conferences and forums.

Major General Aneeq ur Rehman

Major General Aneeq ur Rehman has diverse experience of command, staff and instructional appointments. The General Officer has been on the faculties of School of Infantry and Tactics, School of Armour and Mechanized Warfare, Command and Staff College and National Defence University. He has performed as Director Military Training (Combat) at General Headquarters. Presently, he is serving as Director General Operations and Plans at Joint Staff Headquarters.

Executive Summary

Findings (Seminar and Roundtable)

Institute for Strategic Studies, Research and Analysis, NDU, organized a one-day National Seminar on “Developing a National Discourse on Climate Change” on 13th February 2018. The Chief Guest for the opening session was Minister for Climate Change Mr. Mushahid ullah Khan. Mr. Sartaj Aziz, Deputy Chairman Planning Commission, Pakistan was the Chief Guest in the closing session. The seminar was followed by a Roundtable Discussion focusing on the challenges and effects of Climate Change on National and Regional Security of South Asia. Findings of the extensive academic discourse by learned scholars from Pakistan, stretched over the two-day activity are discussed below:-

- Unfortunately, the issue of Climate Change has been overlooked in the national and international domains of the country's policies. The lacking national discourse on the issue has resulted in non-discursive formations due to which people discuss and act upon differently at local, national and global scales.
- Pakistan is likely to face challenges due to the depleting climate funds, poor disaster management, lack of communication and coordination between the federal and provincial governments and instability stemming from the effects of a changing climate. An example of this is the 55% of the country's workforce employed in the agriculture sector, which

faces immense job insecurity due to the looming threat of climate change.

- According to the climate index, Pakistan is ranked at 7 in facing climatic vulnerabilities that can be worsening by a rise of 2 degrees in temperature and beyond.
- There is disconnect between federation and federating units on the signing of the international protocols and lot of blame game is going on both sides. Neither takes the full responsibility.
- Stress on resources is the leading cause of unemployment and lack of basic economic opportunities.
- Abrupt changes in water patterns e.g. excessive cold and hot weather are leading causes of recurring floods and droughts.
- Health conditions and disease epidemics are increasing with changes in weather conditions. Due to lack of resources and economic opportunities people are forced to flee their houses, which is a leading cause of urbanization.
- Impacts of Climate Change can also be seen in the form of Resources scarcity. Energy, water and food sources are depleting with every passing day.
- Food production requires massive amount of water and Pakistan`s water productivity is quite low. Agriculture sector is the largest consumer of water in Pakistan with about 90% of available flow utilized.
- The vulnerability of Climate Change and food security is also socially, politically and economically embedded.
- According to a survey of Ministry of National Food Security and Research, majority of areas in Sindh, Balochistan, Khyber Pakhtunkhwa and Gilgit Baltistan show high, very high, moderately high and moderately low level of undernourishment respectively, whereas less than 5% area, mainly in Punjab are shown to be well nourished.
- Climate Change, environmental degradation and military security are interlinked and create a security dilemma for countries which then resort to the use of military in order to enforce a plan for the national interest.
- Climate Change is termed as a non-traditional security threat because of its indirect impacts on the society and the challenges that it creates for the countries in a resource deprived environment.
- Pakistan has an overburdened military entangled in relief, rescue, and rehabilitation operations. Climate Change poses a direct threat to military infrastructure, preparedness, and operations.
- Military has an important role to play on issues related to natural as well as climate induced disasters. In view of absence of National Security vulnerability indices, it is difficult to quantify the hazardous results of Climate Change in national security in concrete terms.
- A lot of negativity has been surrounding CPEC and its environmental impacts. The critics of CPEC believe that the project has negative impacts on Climate Change and would make Pakistan's Climate Change efforts more inadequate.
- This contention is based on two assumptions: firstly, that CPEC Energy, Connectivity and Special Economic Zones (SEZs) projects are harmful to the

Climate and secondly that CPEC is not going to add to the Resilience needed to combat adverse Climatic effects. However, it was noted, that the nine SEZs in the CPEC project, which are criticized for contributing to environmental degradation are at infancy as far as their planning is concerned. The fully functional SEZs with their imaginary chimneys gushing black smoke is nothing but hype. With a fully developed CPEC, Pakistan will be deriving optimum benefits directly helping in its adaptation and mitigation efforts and indirectly by bringing in prosperity, making available more resources to fight Climate Change.

- The Trans border flood early warning mechanism is weak with India that causes the floods to go undetected.
- The major challenges for effective national disaster management include lack of sophisticated technology and weather forecasting facilities in the national meteorological department
- Mindset of relief centric reactive approach is not appropriate that prevails in our disaster management departments causing natural calamities to loom over affected areas every year.
- Civil defense departments are inefficient; Lack of capacity and resources is causing difficulties in the emergency response system putting burden on military relief forces.
- Stress on the military is overarching and heavy reliance is on the relief and response equipment of the armed forces which is an ad hoc arrangement and not sustainable. The lack of aviation assets is also an aspect that needs to be given due consideration as all reliance is on armed forces aviation services in any disaster.
- To build Climate Change resilience there is need for allocation of funds for Public Service Development Programs (PSDPs). This is necessary because the first causality due to Climate Change is weakening of capacity of individuals, communities and states which in turn enhance the probability of conflicts.
- The vision 2025 outlines governance, institutional reforms and modernization of public sector to address issues like Climate Change. The main focus of the vision entails:-
  - Sustained Indigenous and Inclusive Growth
  - Human and Social Capital
  - Transport, Infrastructure and Connectivity
  - Knowledge Economy through Value Addition
  - Private Sector Entrepreneurship
  - Water and Food Resources
- Governance of Social Policy has worsened with deteriorating Human Development Index. Political Economy of decision making also needs to be addressed because it has been realized that although Institutional Reform at the level of Ministry/Organization are important but have certain limitations.
- Human actions are directly linked with the environment. Almost every human action results in the depletion of environment. On the other hand, elites are benefitting from the environmental degradation, so the prime question should address the balancing factor between the environment and human actions.

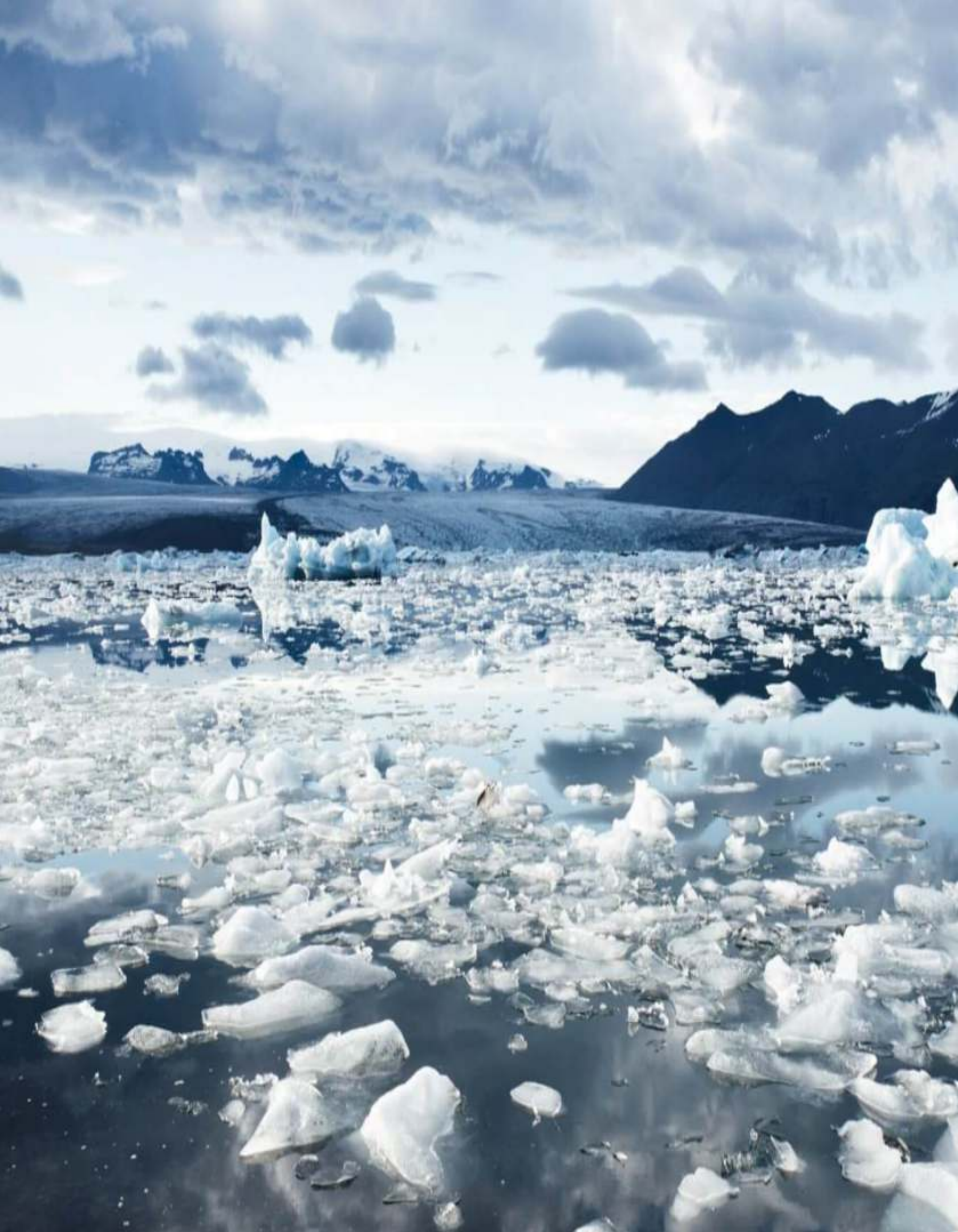
Recommendations (Seminar and Roundtable)

- To build Climate Change resilience there is need for allocation of more funds in PSDPs for relevant departments/institutions. It is also important to build a vulnerability index to address the most vulnerable areas and communities in order to overcome the risk posed by Climate Change.
- Sustainable Development should be Climate Change compatible and friendly. It is foremost that the policymakers support the development of cost-effective, sustainable responses.
- Climate Change is only one part of the problem and a lot is needed to be done with the governance, fixing which would clear maximum of our Climate Change related issues.
- Our provincial and national policies have to be synced with the international protocols that Pakistan has signed.
- On CPEC, the solution lies in collective action, good governance and affective implementation of the policies. It is high time that we talk about the action plan on Climate Change and not just the policies.
- In addition, Chinese cooperation may improve water situation in dry provinces and the resolution to make one dam every decade will tackle water problems of Pakistan.
- To counter the threats posed by Climate Change it is important that the nation now works towards creating a new knowledge base built on sub-national/national and global best practices and benchmarks.
- In food security, it is important to adopt policies that promote water conservation and climate smart agricultural production. We need to change cultural practices by making investments in water and siltation management.
- In this regard, it is important that we adopt policies that promote water conservation and climate smart agricultural production. We should change our agricultural practices by making investments in water and siltation management.
- It is high time that we adopt Climate Change smart strategies and technologies, focus on conservation of water through improved rain water harvesting while ensuring irrigation efficiency of farms.
- Better technologies such as deeper wells, better sewage treatment, better yielding seeds, etc. should be used to improve the country's agriculture network.
- This is possible by inducing micro level intensive forms of cultivation in the agriculture sector of Pakistan. Himalayas is one of the youngest mountain ranges of the world and is subject to outsized silting. This is an area which requires critical attention.
- The government should invest in Afghanistan and in return have predictable quantities of water and guaranteed electricity
- There is a need to facilitate the water policy, which was crafted by the Planning Commission and mandated by the Council of Common Interest.
- The increasing role of the national security

institutions in the sphere of Climate Change management is very crucial. The role of security institutions should be highlighted and be made efficient in all respect. These institutes shouldn't only focus on the management of immediate disasters but also the threat of disasters Climate Change poses. In scenarios, where extreme weather events are to become more frequent, the role of these institutions needs to be redefined.

- There is a need to bring balance in the federal and provincial policies, and in mobilizing our efforts to address both the external and internal challenges.
- It is important that we devise a vulnerability index to address the most vulnerable areas and communities to overcome the risk posed by Climate Change.
- Effective collaboration should be established for the combined effective handling of the disasters and natural calamities and the devastation that it brings with itself.
- Pakistan's armed forces were traditionally prepared to face the conventional threat until the menace of terrorism struck the nation. As a result, the forces had to change their doctrines and strategies accordingly. However, it took considerable time to transform and effectively meet the new challenge. With the emerging threat of Climate Change, the armed forces of the country may have to relook and revisit their strategies in relation to conflict-inducing effects of a changing climate that have now begun to surface.
- Military collaborations should enhance the civil capacity of quick response of community systems. Induction of skilled and trained human resource in rescue 1122 and other related departments would increase the efficiency of the overall system.
- Our Civil defense department is inefficient. The lack of capacity and resources is causing difficulties in the emergency response system putting burden on military relief forces.
- While we have a decentralized system of the disaster management, there needs to be district level setups that can operate at district level effectively.
- Having a Climate Change monitoring section in the disaster management department of every District Headquarter along with a rescue and relief response committee will provide more efficient results.
- The awareness and advocacy initiatives are the need of time for better monitoring and management of Climate Change related disasters.
- There is no need of further policy interventions in the National Climate Change Policy, which is a considerably well formulated document. The idea rests on the notion of prioritizing specific actions and implementing them in the true spirit.
- Conducting seminars and events on Climate Change will enable the government and public to feel the sensitivity of the issue and understand that putting up a united front is the only way to tackle Climate Change hazards.
- There must be awareness workshops and interactive sessions to analyze data that is provided by climate related organizations and work should be done to improve it.

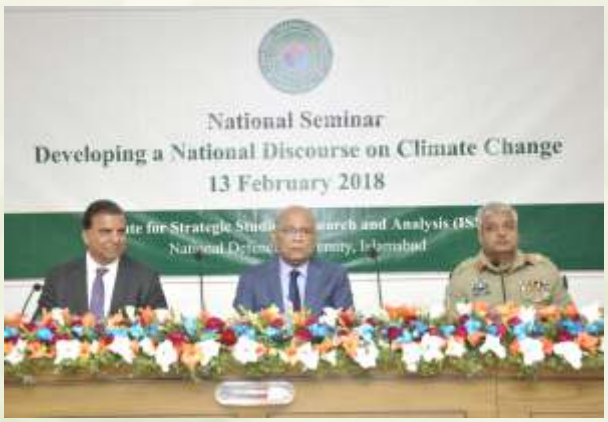
- A shift in focus from the federal to the provincial level with special emphasis on the villages and rural areas is needed. The heart of the financial allocation system needs to be addressed and revised so that development becomes compatible with sustainability. For better results the departments at local levels should be developed and revolutionized.
- Armed forces would need more high tech equipment operable in adverse Climate environment.
- Alternate renewable energy resources should be provided to the nation which will not only save the environment but also create more than a million job opportunities.
- It is important that we review the national 'vision' statement in a manner that we can prepare our future generations against the effects of Climate Change.
- Climate Change and disaster risk reduction/management may be included as compulsory subjects for university students pursuing degree in social sciences, biological sciences, environmental sciences, IT and engineering, mass communication and media, linguistics and philosophy.
- Funds should also be allocated for university student's projects on Environment Protection, Disaster preparedness and Recycling Techniques.
- Pakistan should engage Afghanistan more effectively to start negotiations on Kabul River water and reach some agreement with the Afghan government similar to Indus Water Treaty before it gets too late.
- Evaluation of impact of Climate Change on land strategy, air and maritime is needed. War fighting and humanitarian based assistance should be improved in the zone of operation; because the bad effects of the natural disasters and Climate Change induced hurdles may reduce the operation ability, limiting the military range of operations.
- The developmental strategy of military should be developed according to geographic and climatic zones. Institutionalization of climate modeling techniques in military setups is also the need of time in order to increase the efficiency and enhancement of strategic communication.
- The changing geo-political trends demand that Pakistan is strongly integrated with the international community and Climate Change provides this opportunity. Alignments with groups and a shift towards green technology will help the country end its isolation.
- The exchange of green technologies can reframe the Climate Change issue of Pakistan while helping it align with the Counter Terrorism Department, thus helping the country build a new narrative.
- Pakistan should put Social Policy above the Economic Policy as it would help to foster Environmental Protection.
- We have to develop threat scenarios on both eastern and western borders keeping in view the effects of climate change. Based on these scenarios, we must analyze that how our systems, procedures and equipment will be affected and would change. The given environment necessitates action especially in places like Siachen.



Inaugural Session

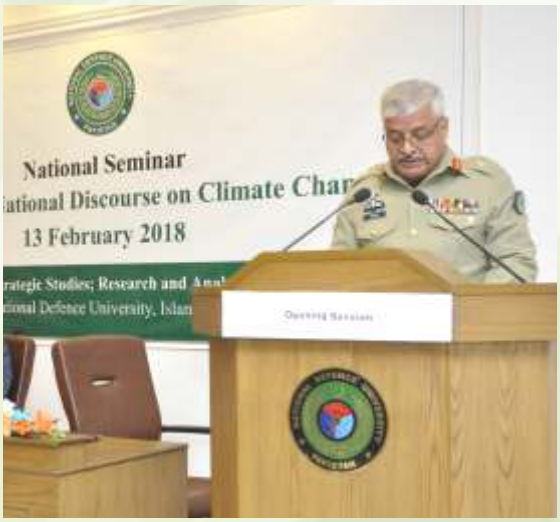
Inaugural of the Seminar

The national seminar titled, "Developing a National Discourse on Climate Change" was held at ISSRA on 13th February 2018. The aim was to contribute to an increased exchange of knowledge within the country on the adverse effects of Climate Change. The deliberative exercise was divided into three sessions. The seminar started with a brief inaugural ceremony. Minister for Climate Change, Mr. Mushahid ullah Khan was invited as the Chief Guest whereas Chairman WAPDA, Lt Gen Muzzamil Hussain (Retd) HI (M) was a Special Guest. Salient points of the speeches made by President National Defence University and the honorable guests are as under:



Welcome Remarks by Lt Gen Majid Ehsan HI (M), President National Defence University

- The president welcomed the Federal Minister for Climate Change and other honorable guests at the National Seminar titled "Developing a National Discourse on Climate Change" and hoped for a productive engagement and deliberations on the issue of great importance to all and sundry.
- Climate Change is one of the most significant debating topics of the world. The changing climate patterns around the globe pose a formidable threat to dwellers of the earth. Not only small and developing countries like Pakistan are the worst sufferers in view of their inability to cope with weather-related disasters like flash floods, but major countries are also being adversely affected in the shape of erratic weather patterns, hurricanes and severe flooding of the settled areas. Despite contributing very little to the overall Greenhouse Gas (GHG) emissions, Pakistan has been listed amongst the most vulnerable countries to the consequences of the Climate Change because of its diverse geographical and climatic features.
- In Pakistan's context, the country faces a multitude of problems such as increased variability of monsoon,



receding of Himalayan glaciers negatively affecting Indus River system flows, decreased capacity of water reservoirs and extreme events such as floods and droughts.

- The changing climate would induce severe water stress, and Pakistan will face food insecurity due to decreasing agricultural production. Monetary losses to the country due to Climate Change already amount to almost Rs. 1 billion annually. The problem has been exacerbated by lack of coordination between concerned departments and non-implementation of adaptation and mitigation policies at the public and the private level making Pakistan the seventh most vulnerable nation to the impacts of Climate Change.
- With China Pakistan Economic Corridor (CPEC), Pakistan is now ushering into a new era of development. The Corridor is not only Pakistan's first big injection of foreign direct investment in a while, but also with its focus on energy development, is a blessing in disguise for a country that has suffered worsening energy shortages for almost two decades. With renewable energy projects constituting much of the $33 billion, the CPEC is also set to make Pakistan a global player in meeting its Paris Agreement commitments to fight Climate Change. However, the planning and development sectors need to consider sustainable development practices for a better tomorrow.
- Pakistan's armed forces were traditionally prepared to face the conventional threat until the menace of terrorism struck the nation. As a result, the forces had to change their doctrines and strategies accordingly. However, it took considerable time to transform and effectively meet the new challenge. With the emerging threat of Climate Change, the armed forces of the country may have to relook and revisit their strategies in relation to conflict-inducing effects of a changing climate that have now begun to surface.
- The importance of Climate Change projection in policymaking, non-traditional security, resource management, economic activity and technological advancement cannot be overlooked. There is an imperative need to run a persistent awareness campaign to educate the masses about the impacts of Climate Change and their contribution to the national efforts including refraining from cutting trees, switching to clean energy, using fuel-efficient transport and most importantly, the implementation of the three R's i.e. Reduce Reuse and Recycle in order to help cut down on the amount of waste we throw away. The Government of Pakistan including all its constituent provinces needs to extend full cooperation to one another by taking appropriate steps in line with its policy framework.
- In the end, the President hoped that the deliberative exercise would enable all stakeholders to develop a national discourse and would help crystallize all the possible remedial and mitigation strategies needed against the traditional and non-traditional threats asso-

ciated with the environment, and changing climate.

Introductory address by Lt Gen Muzzamil Hussain (Retd)

HI (M), Chairman of Water and Power Development Authority (WAPDA)

The distinguished Chairman of WAPDA highlighted the importance of tackling Climate Change related issues for Pakistan. He emphasized on following:-

- From the total of world's water, 3% is fresh and rest is Saline. Of the 3% Fresh Water, 70% is locked in glaciers, 29% is found in underground aquifers and 1% is found in lakes, rivers and streams.
- Climate Change is a looming threat where the world needs to make efforts to take measures to mitigate the degradation of earth's natural environment and build a future for the globe where people live in harmony with nature. We must reduce our carbon footprint by reducing the wasteful consumption of resources while promoting sustainable development.
- ·The world unfortunately thinks that it can manage the negative offsets of events resulting from Climate Change. It needs to be noted here that despite the interconnectedness and close relations between countries, the world has been unable to bring a halt to global conflicts.
- Asia is the Centre of global water security issues. At present, water has out stripped oil as the world's vital resource since water is closely tied to food and energy resources. In addition, Climate Change has become a security issue more than an economic one.
- Asia, home to 60% of the world's population, faces a looming struggle over water resources due to water intensive industries and agriculture. A growing population and meat eating middle class makes Asia the most threatened continent especially if we add to its relative poor governance and fragile institutions.
- As the 6th largest country in the world with vastly varying ecosystems from snowy mountains in the North to deserts in the South, Pakistan is blessed with great natural resources. The utilization of these resources is vital for the country's long term development.
- Each of these ecosystems has with them a huge set of available resources and these resources are responsible for the economic development of the country. Amongst the vast plethora of resources,

Pakistan has two highlighting features, namely; aridity of its terrain and dependence on the single Indus River.

- Pakistan contributes very little (135th) to Green House Gases (GHGs) but remains one of the most vulnerable countries. It contributes only about 0.8% of the total global GHG emissions. Yet Pakistan is particularly vulnerable to Climate Change, since it has experienced an average rise of 0.5°C in temperature.
- Visible changes in hydrological cycle have been observed in the form of changing precipitation patterns, droughts, changed water availability periods and an increased frequency of heat waves.
- Pakistan is an arid country and has much dependence on the Indus River. It has an agrarian economy with agriculture forming a large part of the economy and having a big contribution to Gross Domestic Product (GDP). Pakistan's economy is agrarian where agriculture constitutes up to 21% of the GDP. Agriculture directly impacts 40% of our economy directly and 60% indirectly.
- Water usage in agriculture from a consumption angle remains extremely high. Despite having natural potential, Pakistan does not utilize its resources to the maximum.
- Physical security and human security are both top concerns for countries. International Climate Change protocols have helped establish interconnectedness for countries to cooperate on issues stemming from Climate Change.
- Human security has four basic components, namely: water, food, energy and climate. Water problems in Pakistan are a ticking bomb with major cities all affected as much as well-known water scarce countries such as Yemen or South Africa.
- Pakistan in 1947 faced 3 challenges: politically in context of water, infrastructural issues pertaining to transport of water to water scarce areas and the issue of salinity in the heartland of Punjab where water was most available.
- The heartland of Punjab was left dry because of the three Eastern Rivers (Beas, Ravi and Sutlej) were given to India. Based on the Indus Water Treaty there was a need to carry the waters from the three western rivers to the Eastern Rivers.
- Keeping Pakistan's dilemma in view, WAPDA carried out mammoth work in building world's largest earth filled dam, six barrages and seven link canals but unfortunately it defected the ecology.
- When this water was being diverted to Punjab, it posed the challenges of water logging and salinity. WAPDA made great technological advancements in the1960s and the 1970s to ameliorate these issues.
- Having found a good discovery of natural gas reserves in Balochistan, the decades of 60s and 70s thus proved to be an economic success for Pakistan.

- Starting from 70s and into the 80s the country's policies finally addressed the issue of water scarcity.
- Pakistan's political bureaucratic system is a hindrance in restructuring and reforming the systems to ameliorate water scarcity and Climate Change related issues. Agreements take a lot of time to materialize. Pakistan lacks latest technology such as aqueducts which other countries have obtained long ago.
- Pakistan does not have arrangements in place to preemptively act in case of drought in vulnerable areas such as Sindh. Water storage capacity of Pakistan's dams remains very little. There is not sufficient discourse in Pakistan on such technical issues despite the looming disaster.
- Unfortunately, the Kachhi Canal Project that had been delayed for 15 years caused economic losses worth Rs. 57 billion. However, the Kacchi Canal Project was inaugurated by the prime minister in 2017. This represents a positive development.
- Issues in the system exist at both micro and the macro level. Pakistan does not lack in intellect but in resources. The policies unfortunately, do not focus on the development of expertise and research.
- In order to move forward, areas such as the country's agricultural system needs to be addressed at priority. Better technologies such as deeper wells, better sewage treatment, better yielding seeds, etc. should be used to improve the country's agriculture network.
- Foreign companies have been exploiting the situation in Pakistan to perform basic functions at exorbitant rates whereas Pakistan could adjust and perform such functions itself. Improvements in Management and conservation strategies could lead to huge amounts of water saved from wastage as well.
- In addition, Chinese cooperation may improve water situation in dry provinces and the resolution to make one dam every decade will tackle water problems of Pakistan.

Keynote Address by the Chief Guest Mr. Mushahid ullah Khan, Minister for Climate Change

The Federal Minster for Climate Change Mr. Mushahid ullah Khan extended his gratitude to President NDU, Lt Gen Majid Ehsan HI (M) for organizing the event on Climate Change, an issue of immense importance for Pakistan's national security and future. The Minister stressed on the following issues:-

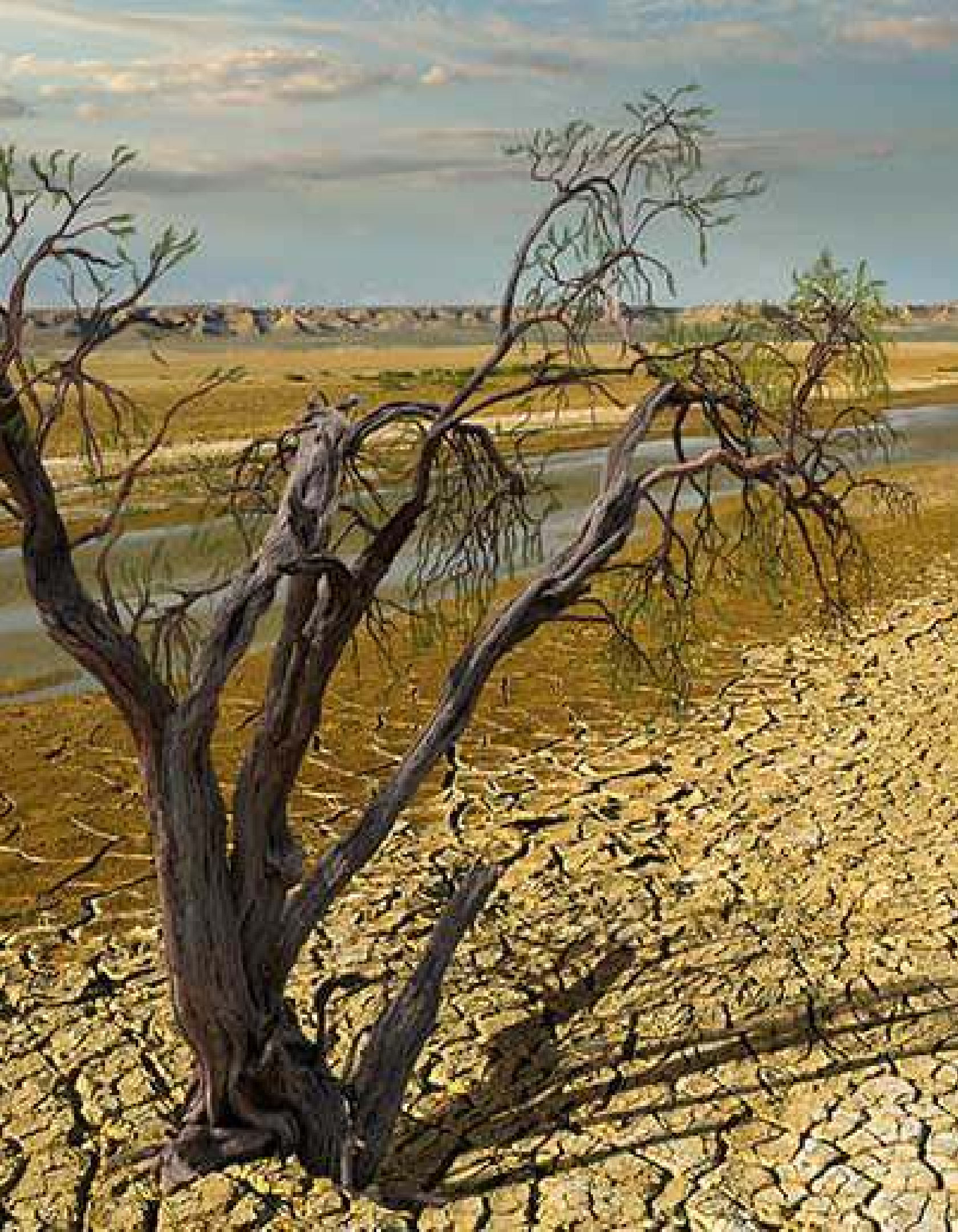
- Climate Change is the most relevant issue of contemporary times. It not only threatens the sustainable economic growth and development but challenges the existing political, social and economic pillars as well.
- Climate Change has caused additional stress on Pakistan's existing resources and will be a serious impediment to the whole spectrum of socio-economic development. The challenges demand

enhanced cooperation among the international community in addition to collaborative efforts at national level by all stake holders.

- The recent climate disasters across the globe are a reminder of the magnitude of the impact Climate Change could have on the life and livelihood of people. Such impacts not only undermine socio-economic development, but also reverse the gains made by governments thus pushing people back towards poverty, hunger, and disease.
- Although Pakistan's contributions to global environment degradation is minimal, yet it faces great impacts of the changes in global climate. Scientific studies have categorized Pakistan as extremely vulnerable. The recurrent floods, heat waves, cyclones, droughts, glacial melt and sea-level rise are some of Pakistan's biggest challenges.
- Threat of climate related challenges have hampered government's efforts to reduce poverty, enhance food security and improve health care. The Government of Pakistan has allocated 8% of its budgetary resources to address Climate Change in order to prevent extreme pressure on its economy. It has also developed a comprehensive strategy to address Climate Change to identify polices, approaches and implementation pathways for both adaptation and mitigation. The National Climate Change Policy for the period from 2014 to 2030 serves to integrate climate friendly policies for national, economic and development planning. Government's mitigation measures cover all sectors of economy to offset carbon emission in the transport sector. The Government has operationalized mass transit system in metropolitan cities of Pakistan. A comprehensive approach on disaster risk reduction and management has also been adopted. Steps for structured policies and institutional arrangement for disaster preparedness to mitigation like reuse, relief, recovery, rehabilitation and reconstruction have been put in place both at national and sub national levels.
- The Government of Pakistan, at first and foremost, has ratified the Paris Climate Agreement. Based on a study carried out by an expert Group, Pakistan's Intended Nationally Determined Contributions (INDCs) were forwarded to United Nations Framework Convention on Climate Change(UNFCC) Secretariat.
- In February 2016, Pakistan perhaps became the first country in the world whose National Assembly passed unanimous resolution adopting its 2013 agenda as national development agenda. The Sustainable Development Goals were therefore later termed as

Pakistan Development Goals.

- The landmark Pakistan Climate Change Bill was passed unanimously by both houses of the Parliament. This law provides Climate Change Council chaired by the Prime Minister and the Pakistan Climate Change Authority to prepare and supervise implementation, adaptation and mitigation prospects in various projects. Both the Council and Authority will also coordinate, monitor and supervise implementation of the National Climate Change Policy and Sustainable Development Goals. Pakistan is one of the few countries in the world to have a law specifically dedicated to Climate Change.
- The National Forest Policy of Pakistan has been approved by the Council of Common Interests. The Green Pakistan program was launched under the direction of the then Prime Minister Mian Muhammad Nawaz Sharif with the objective of creating resilience and mainstreaming adaptation and mitigation measures through ecologically targeted initiatives including measures for revival of forestry resources and conservation of bio-diversity. Law for sudden events which can release millions of cubic meters of water and debris yielding to the loss of life, property and livelihood amongst remote and poor mountain communities has been made. To reduce the vulnerability of communities in Northern Areas to Climate Change induced projects are underway, out of which some have been successfully completed recently.
- He concluded by asserting that, there is a dire need to synergies all capabilities, strengths and resources to translate the recommendations of National Climate Change Policy into tangible measures which can help develop Pakistan's national discourse into practical work. It is the need of the hour that all stakeholders' especially provincial governments come forward along with media, academicians and all segments of the society to corroborate in serving the cause of Pakistan by generating a comprehensive discourse on Climate Change.
- Conducting seminars and events on Climate Change will enable the government and public to feel the sensitivity of the issue and understand that putting up a united front is the only way to tackle Climate Change hazards.

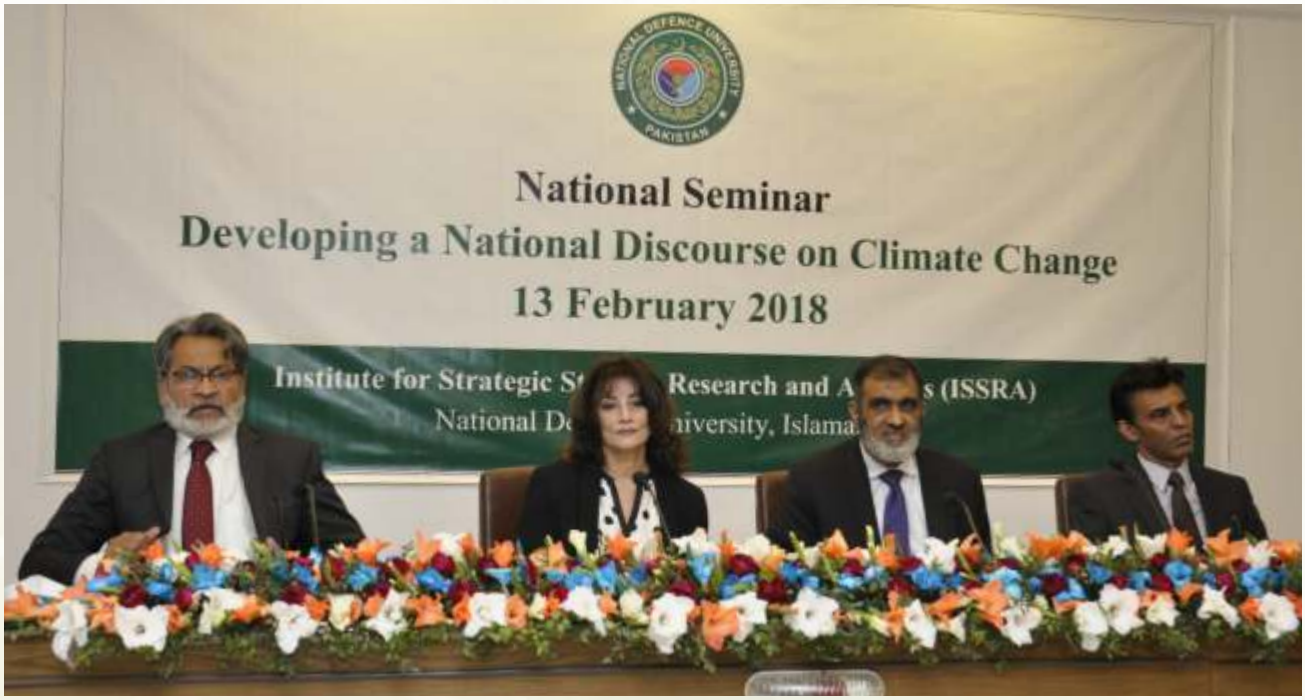


Session 1

International and National Dimensions of Climate Change

Chair: Ms. Aisha Khan

Session I: International and National Dimensions of Climate Change



Ms. Aisha Khan, Founder and Chief Executive Officer of the Mountain and Glacier Protection Organization (MGPO) chaired Session-I titled "International and National Dimensions of Climate Change". The panel of four made three presentations on; "Climate Change: A non-traditional security threat", "Pakistan's Climate Change policy and the Intended Nationally Determined Contributions (INDCs) under the Paris Agreement: An Appraisal" and "Developments under CPEC and its effects on Climate" by Dr. Abid Qaiyum Suleri, Syed Abu Ahmed Akif, and Dr. Safdar A. Sohail respectively.

Climate Change: A Non-traditional Security threat by Dr. Abid Qaiyum Suleri, Executive Director, SDPI, Islamabad

Climate Change has emerged as a non-traditional security threat. It encompasses unpredictability and uncertainty about weather patterns, temperature and water resources. Therefore, Climate Change in short is water and temperature: either the shortage or the abundance of both. Security consists of four tiers,

- Global security
- Regional security
- National security
- Individual security

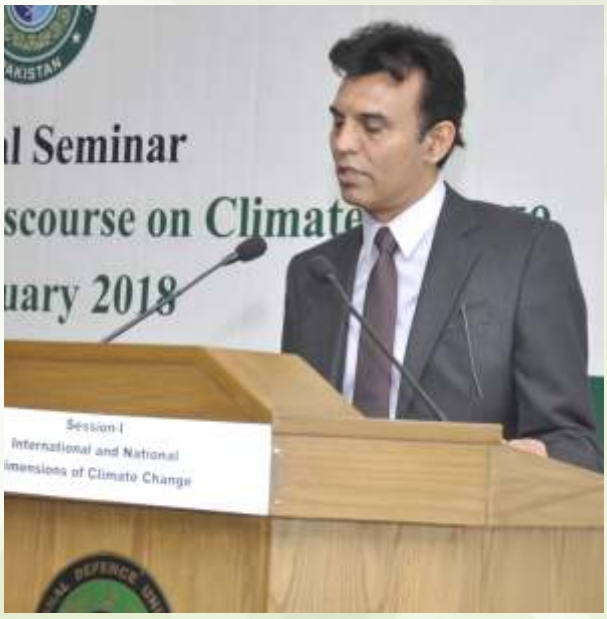
These levels of securities are not mutually exclusive, rather they are interconnected. The interconnectedness makes it difficult to address the security of the state if security at one of the other levels is compromised.

The individual security is one of the most

neglected aspects of security. When grievances of individuals gain a collective voice, they can cause social instability which in turn would lead to political instability. This political instability can give an opportunity to regional players to manipulate and aggravate the already volatile and unstable situation of world affairs.

The general assembly report 2009 focused on examining Climate Change in the prism of pre-existing social, economic and environmental threats. The threat to national security posed by Climate Change is in the form of Fs which consist of:

- Fiscal crisis
- Fragility of weather
- Fuel crisis
- Fertility decline
- Functional democracy crisis
- Food crisis



Human needs and survival is continuously challenged by Climate Change. Impacts of Climate Change can be seen in the form of resource scarcity since energy, water and food resources are depleting with every passing day.

Stress on resources is a leading cause of unemployment and lack of basic economic opportunities. Abrupt changes in water patterns e.g. excessive cold and hot weather is a leading cause of recurring floods and droughts.

Health conditions and disease epidemics are increasing with changes in weather conditions. Due to lack of resources and economic opportunities people are forced to flee their houses. This has resulted in rapid urbanization. No matter how hard we try to address any of the issues listed above we are unable to reach a solution due to the high degree of interconnectedness.

The environmental situation of Pakistan has further aggravated due to the excessive wastage of water and our careless attitude towards it. One can still recall the time when people used to laugh at the possibility of scarcity of the natural gas. Those were the times when people would keep their burners burning whole night just to save one match stick. Same is being done with water today. Shortage of water reservoirs has led to low storage capacity. Thus, per capita availability of water and underground water level has gone further down. It can therefore be concluded that natural and manmade hazards vulnerability could lead us to unprecedented disasters.

In Pakistan, food shortage has led to the under nourishment of one-fifth of its population. According to a survey of Ministry of National Food Security and Research, majority of areas in Sindh, Balochistan, Khyber Pakhtunkhwa and Gilgit Baltistan

show the high, very high, moderately high and moderately low level of undernourishment respectively, whereas less than five percent of area, mainly in Punjab has shown to be well nourished.

There are number of facets of poverty including: economic poverty, water scarcity, poor living standards, and resource food shortage. Sindh and Balochistan are highlighted to be under the spell of multidimensional poverty except for the central Punjab. Furthermore, the majority of the areas of Punjab, Sindh and Balochistan are under the threat of floods, drought and earthquakes.

Pakistan is facing border disputes with India on water and other issues; therefore, the pace of development has been negligible. In addition to that, Pakistan's armed forces are further burdened with rescue, relief and rehabilitation missions, besides responsibilities to safeguard borders and combat terrorism. The military also faces the direct threat to military infrastructure, preparedness, and operations.

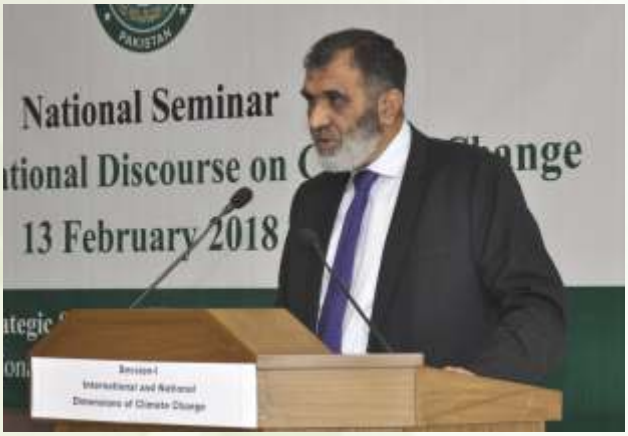
To build Climate Change resilience there is need for allocation of more funds for PSDPs. This is necessary because the first causality due to Climate Change is the weakening capacity of individuals, communities and states which in turn enhance the probability of conflicts.

It is also recommended to build a vulnerability index to address the most vulnerable areas and communities to overcome the risk posed by Climate Change. Moreover, sustainable development should be Climate Change compatible and friendly

Pakistan's Climate Change Policy and the Intended Nationally Determined Contributions (INDCs) under the Paris Agreement: An Appraisal by Mr. Syed Abu Ahmed Akif, Secretary Inter Provincial Coordination and Ex Secretary Climate Change

The processes that were developed to make Pakistan's national Climate Change policy as well as the methodology were a part of the INDCs to overcome challenges posed by Climate Change. In short, the national response was documented in National Climate Change policy.

At the outset, the previous century was called the century of economics and this is the century of climate. The common thing



between the two is that people who are impacted do not have much to contribute in the happenings of both. There is a difference between Climate and Climate Change. Climate is the average statistical description of the weather over the period of several decades, and Climate Change is change in climate because of excess of natural variability.

Pakistan's National policy on Climate Change (NCC) is adopted under the United Nations Framework Convention on Climate Change (UNFCCC) which is committed to work for reducing the greenhouse gases. To formulate the policy, extensive consultation was undertaken with all relevant stakeholders including Federal Ministries and Departments, Provincial Governments and their line-departments, NGOs and Civil society organizations, trade and Industries along with the academia. The policy was approved by the Federal Cabinet on 26th September 2012 and launched in February 2013.

The primary goal of NCC is to ensure that Climate Change is mainstreamed in the economically and socially vulnerable sectors of the society in order to steer Pakistan towards climate resilient development. The objectives of the NCC are listed below:

- Sustained economic growth by appropriately addressing Climate Change challenges
- Integrate NCC policy with other inter-related national policies
- Focus on pro-poor gender sensitive adaptation while also promoting mitigation to the full extent in a cost-effective manner
- Ensuring water, food and energy security in the face of Climate Change challenges
- Minimizing the risks arising from the expected increase in frequency and intensity of extreme weather events such as floods, droughts and tropical storms
- Projecting the recession of glaciers threatening water inflows into Indus River System (IRS) along with other water stresses
- Strengthening inter-ministerial decision making and coordination mechanisms on Climate Change
- Facilitating effective use of the opportunities, particularly finances, available both at national and international levels
- To foster the development of appropriate economic incentives to encourage public and private sector investment in adaptation measures
- Enhancing the awareness, skill and institutional capacity of relevant stakeholders; and to promote conservation of natural resources and long term sustainability.

It needs to be noted here that in the end it is more important to enhance awareness and institutional capacity since it is usually decided last how we deal with policy and how efficiently we are able to implement it.

The key sectors which are listed for mitigating Climate Change related threats are: Energy, Transport, Road, Railway and Aviation, Agriculture and Livestock, Forestry, Town Planning, and Industries. Key sectors which are listed for adaptation to Climate Change threat include, Water Resources, Agriculture and Livestock, Human Health and Gender, Forestry and Biodiversity, Disaster Preparedness, and Other Vulnerable Eco-Systems.

In the NCC, policy measures were suggested for Capacity Building and Institutional Strengthening, Creating Awareness, focus-

ing on International and Regional Cooperation, Finance, Technology Transfer and Policy Implementation Mechanisms. Policy measures that were suggested are to be addressed by the provincial governments.

An implementation framework is also launched to oversee progress in implementation of NCC. It has established an Implementation Committee at the Federal level to monitor the programs. One of the tasks of the Committee is the regular monitoring and up gradation of the NCC at five-year intervals. The committee has devised 750 actions which are divided on the bases of priority, short, medium and long-term actions of 2, 5, 10 and 20 years respectively. These actions are to be taken at provincial level.

NCC has devised a plan of action and strategies to be adopted for different sectors. Sectors such as, water resources, agriculture, forestry, urban planning, health and coastal areas, etc. are attributed different actions, strategies for adaptation and mitigation measures. Many actions and strategies are enlisted for overcoming challenges of Climate Change. Yet, what needs to be done is the implementation of these strategies.

NCC is headed by the Minister of Climate Change at the Federal Level (Chair). It includes Secretaries of Ministries responsible for Climate Change/ Planning and Development and other related disciplines. Furthermore, Chairman NDMA, provincial secretaries, and representatives from corporate sector, commerce and industries and members of civil society are also a part.

The UNFCCC has noted that Pakistan is a mini scale contributor of global GHG emissions. However, owing to increased energy demands, the level of emissions is expected to rise in the coming years. Net Carbon dioxide emissions in 1994 were 181.4 cubic tons which jumped to 405.07 cubic tons in 2015. INDC has projected that the net emissions in year 2030 will be 1603 cubic tons.

Having considered the existing potential for mitigation in the country, Pakistan intends to reduce 20% of its 2030 projected GHG emissions subject to availability of international grants and the financial and technical support. But the target seems to be over-ambitious.The total reduction cost calculated at current prices based on the overall marginal abatement cost for the indicated 20% reductions amounts to US$ 39.7 billion. Similarly an average adaptation cost is USD 7-14 billion/ year.

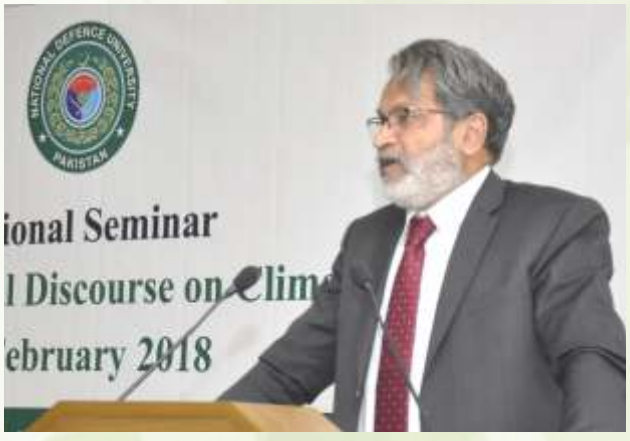
Lastly, Pakistan has a NCC, but one should not forget that hundreds of people are required to make a policy, thousands are required to implement it but it takes only one person to destroy a policy.

Developments under CPEC and their effects on Climate by Dr.Safdar A. Sohail, DG National Institute of Management

The misconceptions and criticism on CPEC as being a threat to the environment are an exaggeration. The critics of CPEC believe that the project has negative impacts on Climate and would undermine Pakistan's efforts to combat Climate Change. This contention is based on two assumptions: Firstly, CPEC Energy, Connectivity and SEZ projects are harmful to the Climate and secondly, that CPEC is not going to add to the resilience needed to combat the adverse effects of Climate Change.

Since the start of CPEC, a number of campaigns were initiated to discredit the project. These campaigns primarily focused on framing the issue as an ethnic competition of resources, an issue of economic exploitation, theft of national resources and a disregard to the interest of locals by the corruption ridden. In recent times, the focus has shifted towards using Climate Change to discredit CPEC.

Any discredited campaign would amplify the pre-existing societal sensitivities and introduce new fears/risks. Similarly, a 'holistic' campaign would deploy resources to bring into play as many of these contestations as possible. For example, a discredit campaign was launched against Bin Qasim coal power plant. A young Pakistani author based in US wrote an article claiming that Bin Qasim coal power plant will greatly affect the lives of people living along the coast lines. The reality is that the Bin Qasim project is not built on a



reclaimed land which if built would have resulted in loss of plantation. It is instead situated next to Liquefied Natural Gas (LNG) terminal. In addition, Pakistan Navy has also planted hundreds and thousands of mangroves along the Coast. The article was picked up by Dawn only to later become viral on social media. This is a glaring example of how different parties, both local and international are trying to discredit CPEC projects and how this campaign affects us in terms of impact due to the snowball effect.

The major assertions that are made on CPEC's negative impacts on climate are projections of pollution that revolve around GHG emissions from the Coal based projects and from the CPEC route vehicles are not only presumptuous but are also based on outdated data.

The role of Coal in the beginning of the CPEC Energy Projects was pre-dominant which is not the case now. The Coal fired power plants have super critical technology and soon industries would become dependent on coal based energy mix which would stabilize around 10% in the longer run. Despite that Pakistan has an edge of being a late entrant in the coal based energy countries unlike countries like China, India and US.

Pakistan is on level 2 of GHG emissions whereas India is on level 4 because of its coal based Energy mix. Most of the emissions in Pakistan are caused by the domestic sphere. Till the time CPEC materializes, there is a need to curb the already existing emissions from domestic sources which are contributing more to the rate of Pakistan's emission levels.

There are nine Special Economic Zones in CPEC project, which are criticized for their likely contribution to environmental degradation. These nine SEZs are at infancy as far as their planning is concerned. The fully functional SEZs with their imaginary chimneys gushing black smokes is nothing but hype.

With a fully developed CPEC, Pakistan will be deriving optimum benefits by directly helping its adaptation and mitigation efforts and indirectly by bringing in prosperity, making available more resources to fight the effects of Climate Change.

Factors behind the snowballing of discredit campaigns on CPEC include:

- Successful involvement of more and more 'stakeholders' on the skeptical side. Examples include, local manufacturing, environment lobbies, nationalists, 'sustainability' conscious educated population, urban and the liberal youth keen to get recognition for their stances on social media.
- Involvement of big sponsors help create alliances amongst critical stakeholders around polarizing claims, thus, putting in place a machine of influence with a proper strategy.
- Variable geo-strategic stance of big powers can produce huge sustained campaigns of public diplomacy e.g., Trade with India.

Climate Change impacts of connectivity projects are also often linked to vehicular emissions. Cargo transportation is exaggerated because CPEC only has two Road Projects i.e., KKH component and Sukkar-Multan Motorway. On the other hand, roads are national priorities and would carry the bulk load of local cargo which in turn would positively impact the performance of the economy.

The transportation to and fro China would take a very long time and in best case scenario, it would not be thousands of trucks plying on CPEC routes every day. As far as the emissions are concerned, we are at Euro II and still have problems with it. European Union is on Euro VII and our neighbor India, is between IV and V. In December 2016 China announced the adoption of “China VI” emission standards by the middle of 2020.

Failure to align CPEC and produce an effective Climate Change Response would cause severe harm to Pakistan's Security. Our poor planning, weak governance and the political economy have manifested themselves through a criminally lagging response to Climate Change up till now. The same factors can combine and we might be overwhelmed by the discredit campaign resulting in a highly compromised internal security in the short term.

As we are not transitioning well from early harvest to the long term plans of CPEC, the enemy might succeed in inflicting a far bigger cost on us for signing up to CPEC than the actual benefit CPEC could bring to Pakistan.

Interactive Session

In the interactive discussion, several issues related to Climate Change were discussed. There were two views about the environmentalist's approach and criticism surrounding CPEC. First, the assertion that the concerns of the environmentalists are to discredit CPEC is wrong. It is a universally acknowledged fact that all human activities have consequences; therefore, the environmentalists are not against CPEC, nor do they want to abandon the CPEC projects, rather they want to ensure that the human impacts of CPEC on the environment are reduced. There are not many details available on

Super Critical Coal Technology that will be imported and its impacts on Port Qasim, since, there will be the impacts as the coal will be stored at the port before it is transported to other parts of the country. One of the biggest reasons why India has worst air pollution records is due to the widespread use of coal.

The second opinion was that CPEC is the project of connectivity, energy and economic cooperation and crucial for Pakistan's progress. If it gets discredited, it will have long term implications for the security, national interest and future of the country. While the well thought out recommendations of policy community and other suggestions are welcome on CPEC, it was opined that the political use of environment and Climate Change should be discouraged. It was pointed out that why should the United Kingdom fund the study on impact of CPEC on water resources?

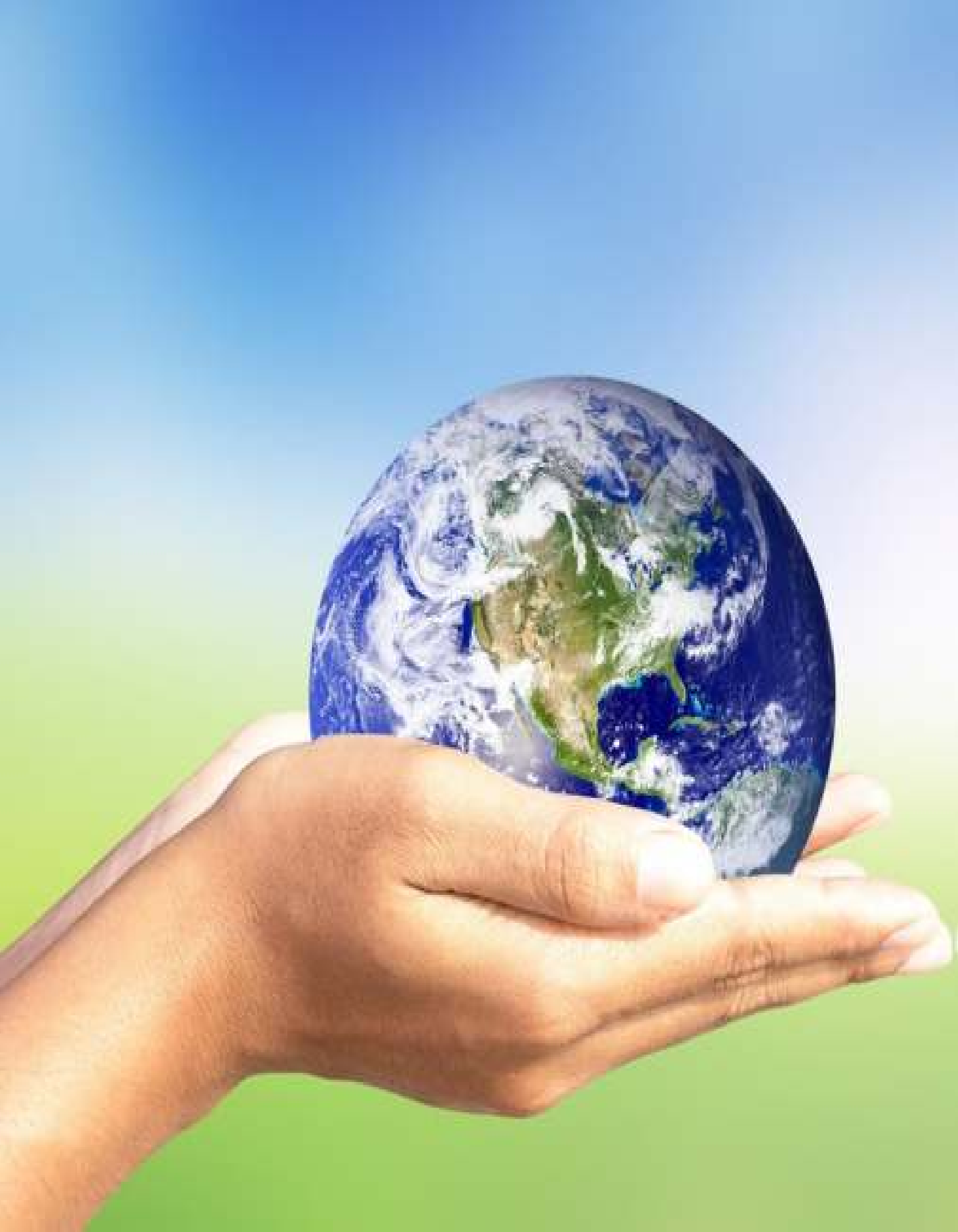
While answering the question regarding recent achievements of the Ministry of Climate Change, one of the speaker pointed out that there are many achievements related to the recent developments such as, operationalization of INDCs; the Climate Change act was passed; and national forest policy was formulated. Additionally, the achievements also include: the green Pakistan project; Montreal project of which Pakistan was an active part; rejuvenation of the research arm of the Climate Change ministry; and the ministry pursued an active participation with the civil society on the Climate Change. However, it is to be noted that it is not the responsibility of the bureaucracy to provide the leadership but to implement the policies of the political leadership. The biggest challenge that Pakistan faces is the lack of capacity and an uncooperative human resource. It is therefore important to invest in the proper human resource development which is well-versed with the issues of climate.

While developing a discourse on national Climate Change, it is important to distinguish

between the development and purely environment related aspects. The current IPCC says, “Climate Change is the result of human activities and which are either the driving factor behind policies and practices or they are the result of policies and practices”. Therefore, it is our policies and practices which are shaping Climate Change. It is the preparedness that may save us from its impacts e.g. the high frequency and impacts of earthquakes in Japan and the Japanese Government's strategies to manage the disaster risk. This shows, one cannot stop natural calamities and disasters, but through mitigation and preparedness the impacts can be reduced.

Wrap up by Chair/ Moderator

While thanking the speakers and participants, the Chair opined that Climate Change is a subject that is multidimensional and multi spectral. We are looking at Climate Change from different perspectives and dimensions: there is vulnerability perspective and from the discussions the idea emerges that Climate Change is only part of the problem and lot has to do with the governance, fixing which would clear lot of our Climate Change and other issues. There is disconnect between federation and federating units on the signing of the international protocols and lot of blame game is going on both sides. Neither takes the full responsibility. Our provincial and national policies have to be synced with the international protocols that Pakistan has signed. On CPEC there are lots of opaque areas but these are due to the lack of transparency and accountability as well as the secrecy that surrounds CPEC. The solution lies in collective action, governance and affective implementation of the policies. Therefore, now is the time that we should talk about the action plan on Climate Change and not just the policies.

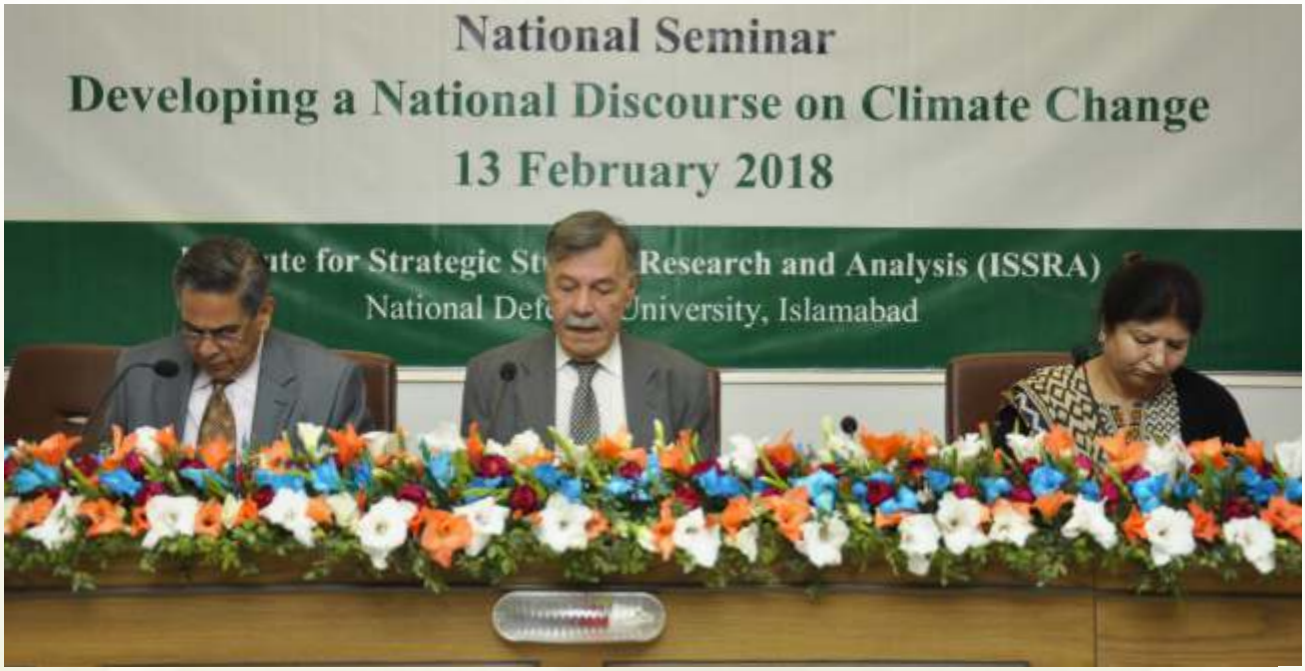


Session 2

Reshaping the Security Landscape: Impact on Energy, Food and Water Resources of Pakistan and Beyond

Chair: Ambassador Shafqat Kakakhel

Session-II: Reshaping the Security Landscape: Impact on Energy, Food and Water Resources of Pakistan and Beyond



Ambassador Shafqat Kakakhel chaired session II titled, *reshaping the Security Landscape: Impact on Energy, Food and Water Resources of Pakistan and beyond.* The two presenters, Mr. Ali Tauqeer Sheikh and Dr. Shaheen Akhtar spoke on "Reshaping the Security landscape of the World: Effects on Global Resources" and "Food Security: Implications for Security of Pakistan", respectively.

Reshaping the Security landscape of the World: Effects on Global Resources by Mr. Ali Tauqeer Sheikh, CEO LEAD Pakistan

The speaker mentioned that it is important to generate a consensus on a new discourse on climate Change. West is responsible for Climate Change and it has to fix it. What Pakistan can do is build institutions and the West can take its responsibility. Even though there is mounting evidence that because of Climate Change across the globe, human habitat is becoming less and less, very little is being done by countries to curb it.

More and more current conflicts are now stemming from Climate Change and it is considered a threat multiplier. An example of this is Somalia's civil war. The civil war is a result of droughts and water scarcity which has caused heavy internal migration. According to the UN, because of reduced lake charge people are migrating to water areas. This causes conflict over the already scarce

water resources.

Floods are not a Climate Change phenomenon but are instead a result of failure of managing water efficiently. Floods are also a result of the inability of the policymakers to make upstream investments. In Thailand, floods caused major riots which had almost become unmanageable.

The United Nations Security Council (UNSC) has now started looking at preventive diplomacy. The UNSC has now com-

pleted its ten years of producing the first set of resolutions on Climate Change. However, those resolutions are not yet in the form of a consensus at a global scale. The UNSC is now trying to focus on preemptive diplomacy.

It is pertinent to understand the internal and external threats emanating from Climate Change that pose a greater threat to the security and peace of Pakistan. The subject is becoming increasingly conflict prone and needs thorough deliberation. It is adding dimensions to conflicts at both international and domestic levels and in the case of public unrest that emerged following the heavy monsoon rains of 2010.

Climate Change is creating a per capita loss for Pakistan of $1450 and if this continues, it will become difficult for Pakistan to achieve goals of its vision 2025. This indicates that the development will become costlier. According to the climate index, Pakistan is ranked 7 in facing the climatic vulnerabilities that can be worsening with an expected rise of 2 degrees celsius temperature and beyond. This makes Pakistan a compelling security case for immediate climate action.

The fundamental security risks Climate Change poses to Pakistan are:-

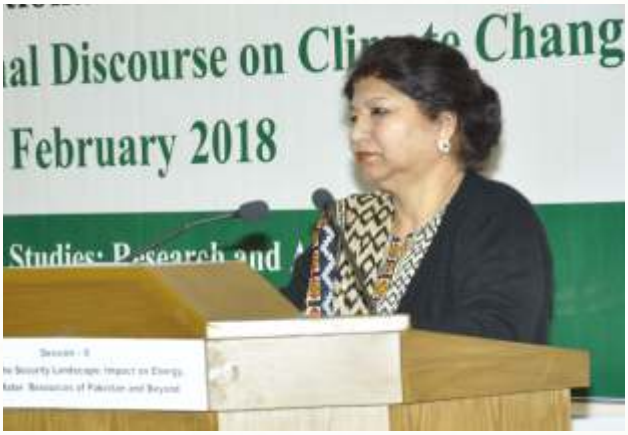
- High occurrence of extreme events such as floods, droughts, heat waves and dust storms
- Damage to strategic infrastructure, such as railways and airports, important buildings and nerve centers, agriculture and industry and ecosystems
- Impact on livelihood patterns such as food, water, shelter and health
- High migration rates due to Glacial Lake Outburst Floods(GLOFs), seawater intrusion and Monsoon Changes
- According to surveys conducted by meteorological department, Pakistan has faced changing climatic patterns such as:-
    - Each successive summer since 2010 has been the hottest recorded

- A shift in the seasons of at least 15 days had been observed
- Over the past 20 years, summer was beginning earlier and winter later than average with increasingly frequent and intense heat waves

World Bank, Ministry of Finance, NDMA, and the Securities and Exchange Commission of Pakistan estimate Annual Economic Impact of Flooding between US$ 1.2 and 1.8 billion (equivalent to 0.8 % of GDP) where as big floods will cost 15.5 billion (around 7% of GDP and 40% of the federal budget).

According to the World Bank estimates, the cost of Environment in Sindh is 372 billion PKR (15% Provincial GDP) where 45,000 people have already died due to environment related health hazards. A study by United Nations Development Program, Ministry of Climate Change and LEAD has estimated that the cost of Climate change and its implications between 1995 and 2014 was US$3.9 billion in average economic losses annually.

To counter the threats posed by Climate Change it is important that the nation now works towards creating a new knowledge base, grounded on sub-national, national and global best practices and benchmarks. In addition, we need to deepen our understanding of the nexus of human security with various security systems such as water security, food security and energy security. Lastly, it is foremost that the policymakers support the development of cost-effective and sustainable responses.



Food Security: Implications for Security of Pakistan by Dr. Shaheen Akhtar, Associate Professor NDU

Food security is a situation that exists when people, at all times, have physical, social and economic access to sufficient safe and nutritious foods. This definition encompasses three pillars of food security, which include physical availability of food, socio-economic access to food and food absorption. Hence, it should be considered as a sequel to security implications for Pakistan, due to various reasons such as depleting water resources along with, high population growth rate and Climate Change which severely affect food security in Pakistan. In this regard, it is pertinent to follow a multi-pronged food-water-energy approach to ensure food availability. Access to food and its utilization is indeed a prerequisite for societal stability. In this regard, there is a need for ecological unity across boundaries to ensure food security.

The global discourse on food security is narrowly framed as it only focuses towards productivity. This in the longer run impacts the food security policy at the national level. In the two major crops of Pakistan, the total national Wheat production for 2016-17 has

been estimated at 25.75 Million Mega Tons, showing a marginal growth of 0.4 percent and the production of Rice (the second main staple crop of Pakistan) has been estimated at 6.85 Million Mega Ton, reflecting a negligible increase by 0.7 percent from 6.8 Million Mega Tons in 2015-16.

Floods, droughts, extreme variability in temperature and rainfall have increased pressure on current food production systems which threaten food security in Pakistan. According to the Global Climate Risk index 2017, Pakistan ranked at 7th position among the most adversely affected countries and nearly 22% of the population is food insecure. According to the United Nations, 45% of Pakistani children under 5 are stunted, 32% are under weight and 15% suffer from acute malnutrition.

Pakistan has experienced a sharp increase in threats emanating from food security in recent years due to combination of militant activity, natural disaster, and economic instability. The vulnerability of Climate Change and food security is also socially, politically and economically embedded. As, there are inter and intra provincial disparities in the society, for example, Federally Administered Tribal Areas (FATA) has the highest percentage of food insecure population (67.7%) whereas the lowest percentage of food insecure population is in Islamabad (23.6%).

Food production requires massive amount of water and Pakistan`s water productivity is quite low. Agriculture sector is the largest consumer of water in Pakistan and India, with about 90% of available flow utilized. However, over pumping and inefficient irrigation techniques have led to sharply declining ground water levels, loss of wetlands and sanitization of agricultural lands. Pakistan is one of the world`s driest countries and 'a single basin' country, with an average annual rainfall of about 240 mm and dependence on external water resources of 76%. Its population and economy are heavily dependent on the annual influx of water into Indus river system. The agriculture sector accounts for: 19.5% of GDP, 42.3% of total employment and more than 60% of the country's export.

Pakistan has a very little water storage capacity. It can barely store 30 days of water in Indus basin, while India can store for 120-220. Pakistan`s agricultural production is closely linked with availability of irrigation water. By 2025, the demand for water is projected to reach 274 Million acre-feet, while supply is unlikely to be more than 191 Million acre-feet.

In this regard, the way forward rests in the following: adopt policies that promote water conservation and climate smart agricultural production, change cultural practices by making investments in water and siltation management, adoption of Climate Change smart strategies and technologies, conserving the available water through improved rainwater harvesting, increased water productivity and increased irrigation efficiency of farms.

Lastly, it is important to understand that food, water and energy are inextricably linked

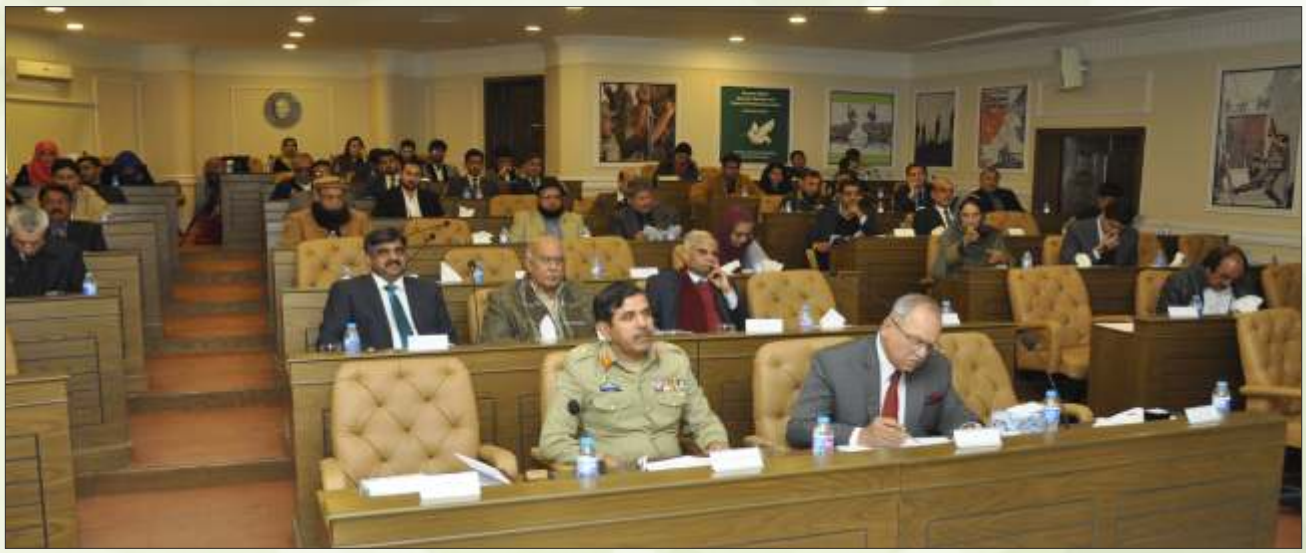
as a nexus and actions in one sector influences others. The water-food-energy nexus is about understanding and managing these often-competing interests while also ensuring the integrity of ecosystems. The nexus of food security with energy and water is a pillar with the aim of achieving sufficient, reliable, clean and cost-effective availability of energy, water and food. It is high time to strengthen cooperation among upstream and downstream in resource management so that more focus can be given to the practical undertaking of the problem.

Interactive Discussion

The participants were keen in deliberating on the issues of external threats of Climate Change, effects on Pakistan particularly India's attempt of building dams on the shared water resources, role of academia in reshaping the security landscape, the Indus Water Treaty and its gaps in referring to Climate Change.

It was highlighted that Pakistan is dependent for water that is flowing from its neighbors. However, unfortunately at the global level the debate is no longer around the rights of a lower riparian state, which is the main tenant of Pakistan's claim. Hence, the conversation has moved towards the efficiency level of water usage. Prime Minister Narendra Modi also referred to this aspect in one of his speech, stating,"We will not give them a drop of water because they waste it".

Statistics suggest that, the per capita availability of water has come down to 750 cubic meters, which can be projected to reach as low as 350-150 cubic meters by year 2030. Thirty-four countries have water usage efficiency less than Pakistan, and twenty-eight are using water more efficiently in terms of drop per crop. Hence, it is pertinent to invest in this domain and improve efficiency with a focus on learning from China's model. In Tibet every year Glaciers are melting at a staggering rate and for that they are drawing longer lines on the map for Indus in China



with which they will emerge as a key stakeholder. Hence, they are having up stream constructions which are not part of the Indus Water treaty. Likewise, Afghanistan's pre-feasibility rough sketches are of about twelve dams. On Kabul River Basin when Chitral River enters Afghanistan, we have about 16 million-acre feet of water, but by the time it comes back it is about 15-18 million-acre feet. In this milieu, we see that the glaciers are also melting, hence in principle the water quantity should be increasing. In this regard, it is important to highlight that between the years 2003-2016, Afghanistan has made many overtures to have negotiations on water with Pakistan; however, we failed to engage more effectively.

It is important to engage with Afghanistan as it has no concrete policy of sharing water. Furthermore, India has constructed a dam in Bhutan and in return buys electricity at a negotiated price. This is an example for Pakistan to follow. Invest in Afghanistan and in return have predictable quantities of water and guaranteed electricity. It is high time that workable policies are in place so that places like FATA are uplifted.

It was brought under discussion that the report by the task force Climate Change' 2009 was the first document of its kind which carried an exhaustive analysis of the effects of Climate Change. The second is NCC; it covers the implementation and activities of Ministry of Climate Change. In the document there is an emphasis on the need to draw upon the wisdom and expertise not only of the Government officials but also of the media houses, civil society and academicians.

It is hoped that more institutions, like Peshawar based Forest institute and Jamshoro University, which have water related programs will contribute further. In addition, the nexus between food-water-energy need to be incorporated in policies, alongside an informed debate on the issues of managing water resources.

Lastly, it was discussed that environmental flows are a scientific concept and unfortunately, we are holding back in conducting studies on how much water we will need for various activities in future. Our lack of commitment is evident from the fact that the position of the Chairman of Indus Water Commission in Pakistan is still lying vacant. It is important to note here that the IWT has an annexure which allows both parties to raise issues of concern, and research under these is very much permissible. This shows that we ourselves are not committed to tackling the issue of water.

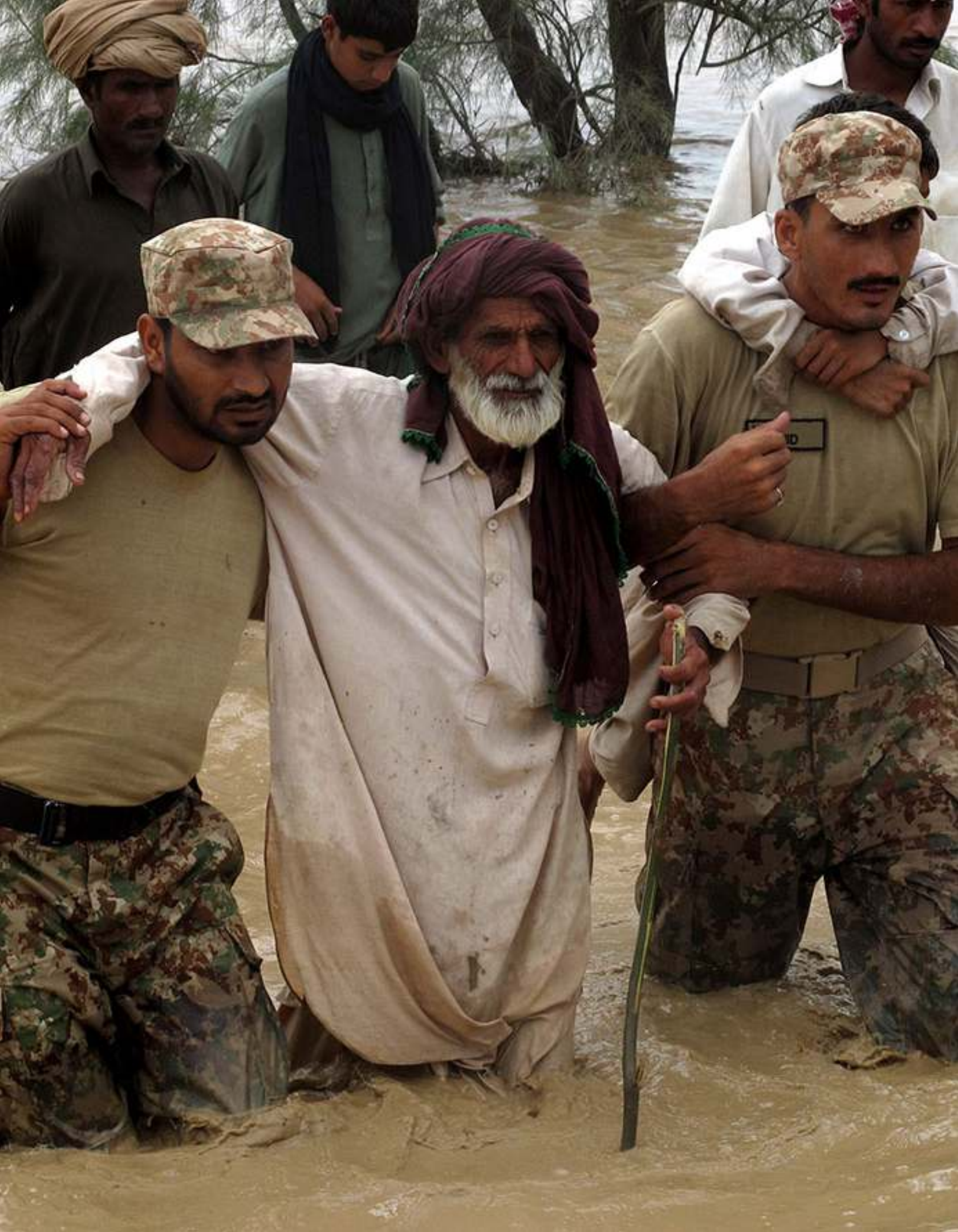
Wrap- Up by the Chair

In the end, the chair mentioned that water and food security in Pakistan has two-broad dimensions, both External and Internal. It is a fact that 78% of our water flows from external sources i.e. the Indus basin and Kabul River. Hence, it is pertinent to maintain integrity of the basin and viability of the treaty, which with all faults and limitations has served both nations well.

The treaty has an effective dispute resolution mechanism; an example is the Salal dam which India was not able to build since past 37 years because of Pakistan's objections. As far as Afghanistan is concerned, cooperation is the key as it has the rights to use water for its benefits. Hence, we should cooperate with Afghanistan in order to amicably solve disputes which would otherwise be detrimental for Pakistan. The fact remains, that the Kabul basin is not that fertile and Afghanistan has five basins out of which four are trans-boundary. There is no evidence that India is facilitating Afghanistan for building dams. It has just invested in one project of Salma dam on Helmand River with the cost of about 370 US million dollars. However, India will have to remember that projects which may be detrimental to a lower riparian state like Pakistan will run the risks of allowing the Chinese to reciprocate in similar manner especially in places where India is the lower riparian.

Also, there is a need to facilitate the water policy, which was crafted by the Planning Commission and mandated by the Council of Common Interest. In addition to efficient water management practices, the most rational option is that in places where there is an increased water flow, simultaneous efforts are made on reducing the demands. This is possible by inducing micro level intensive forms of cultivation in the agriculture sector of Pakistan. Himalayas is one of the youngest mountain ranges of the world and is subject to outsized silting. This is an area which requires critical attention.

Nonetheless, there is a need to bring balance in the federal and provincial policies in addition to mobilizing our efforts to address both the external and internal challenges. There is no need of further policy interventions in the National Climate Change Policy, which is already a well formulated document. The best idea rests on the notion of prioritizing specific actions and implementing them in the true spirit.

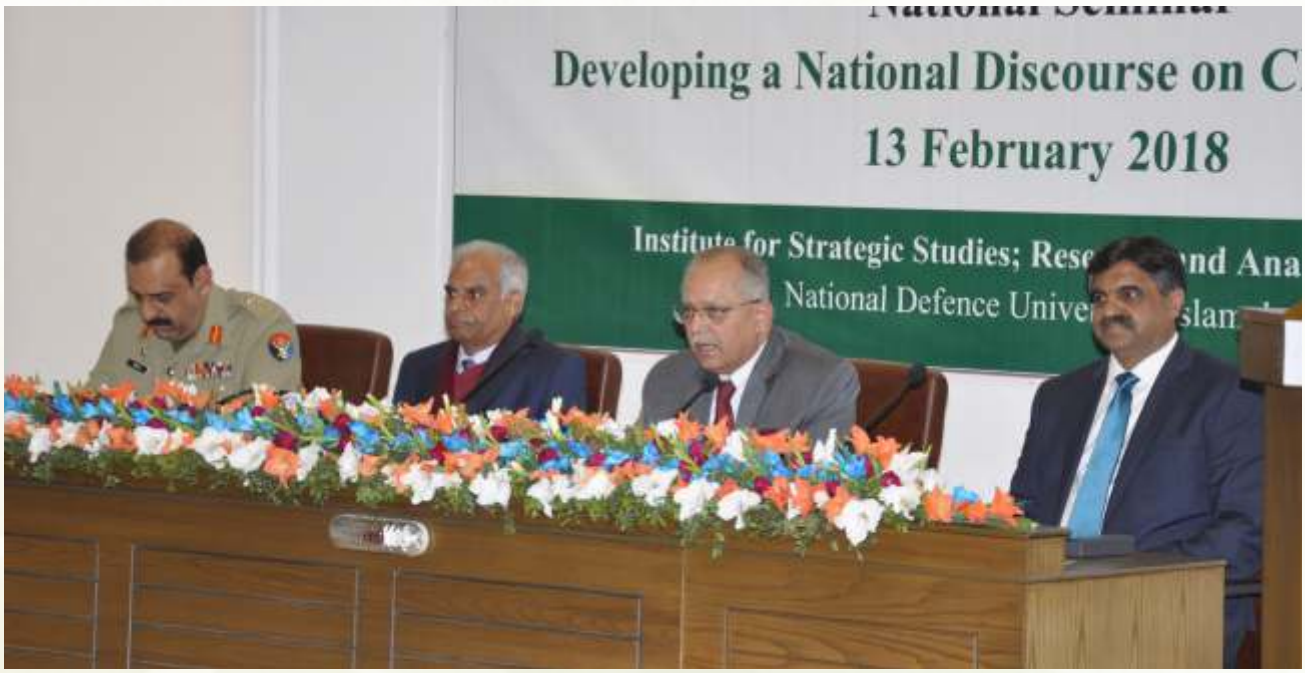


Session 3

Challenges for the Security of Pakistan

Chair: Lt Gen (Retd) Tariq Waseem Ghazi HI (M)

Session-III: Challenges for the Security of Pakistan



Session III was chaired by Lt Gen (Retd) Tariq Waseem Ghazi. In this session there were three presenters, Maj Gen Asghar Nawaz (Retd) HI (M), Dr. Qamar uz Zaman Chaudhry and Maj Gen Aneeq ur Rehman. Maj Gen Asghar Nawaz (Retd) spoke on Enhancing Civil-Military Cooperation for Comprehensive Disaster Management System of Pakistan. The topic Rethinking National Security Policies in the Context of Climate Change was presented by Dr. Qamar uz Zaman Chaudhry whereas Maj Gen Aneeq ur Rehman talked about Challenges for Military Strategies, Operational Doctrines and Capacities.

Enhancing Civil-Military Cooperation for Comprehensive Disaster Management System of Pakistan by Major General Asghar Nawaz (Retd)

Disaster in simpler terms is defined as a catastrophe or a calamity in an effected area rising from natural or manmade causes or by accident which results in substantial loss of life or human sufferings and damage and destruction to property. The disaster management spectrum identified by the NDMA starts from risk assessment in the pre-disaster phase leading to the early warning system. After the onset of the disaster there is rescue operation and then reconstruction.

The geo-physical hazards are not that much related to Climate Change. Pakistan is located in the active seismic zone area. Other hazards, those related to Climate Change include:

- Hydrological hazards
- Meteorological hazards
- Climatology hazards

Hydrological hazards include hazards such as floods, landslides, droughts, cyclones, etc. Examples of meteorological hazards include storms, extreme temperatures and fog. Climatology hazards encompass drought, glaciers, and wild life related disasters.

In disasters like droughts which fall under climatology hazards, we have time to react due to the slow onset of climatic events. On the other end of the spectrum are disasters which fall under the extreme category of events. Due to less time available to react, these mostly include hydrological and meteorological hazards.

Historically, the country has been affected by floods. The country's location on a fault line makes it prone to earthquake related disasters. Although Pakistan was never at risk of cyclones, but now the rise in Arabian Sea level due to rise in temperature has raised the chances of cyclones as well.

Pakistan is a signatory of the Hyogo Framework Action 2005-2015: focused on building the Resilience of Nations and Communities to Disasters (HFA). It describes and explains work that is required from all different sectors and actors to reduce disaster losses. The National disaster management system, under the umbrella of NDMA has progressed from an ad-hoc system to a structured system. At federal level there is National Disaster Management Commission (NDMC). At provincial and district levels there are Provincial Disaster Management Commission (PDMC) and a District Disaster Management Authority (DDMA) which cater to the needs of provinces and districts.

NDMC formulates policies and directions for disaster management policy making and implementation. The stakeholders are the armed forces, NGOs and community. The National Disaster Management act forms the

national disaster management plan. The plan is executed by NDMA in consultation with provincial governments.

Its structure is that NDMA acts as secretariat to the NDMC. NDMC's function is to lay down policies. It approves the national disaster management framework and plan. It also approves plans prepared by ministries, divisions and provincial authorities. It ensures integrated national response in case of a calamity. NDMA manages the complete threat spectrum. It maps all hazards in the country and does the vulnerability analysis on

a regular basis. Armed forces, civil authorities and NGO's are a part of it. At provincial level there is a provincial disaster management commission. The implementation flows down to the lowest tier i.e. district level.

Obsolete weather forecasting devices are a hurdle in efficient disaster management at national level. Therefore, the major challenges for effective national disaster management include lack of sophisticated technology and weather forecasting facilities in the national meteorological department. Good governance and better management practices need to be used in conjunction with good technological facilities for better results.

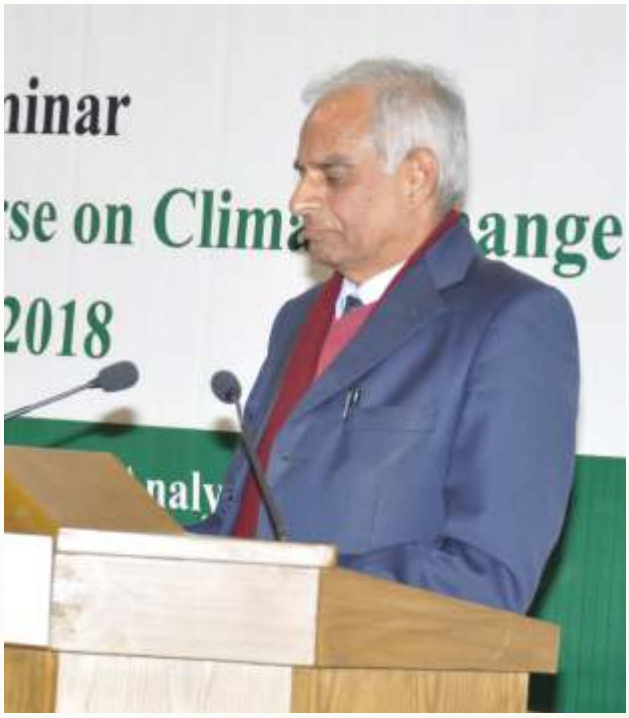
The Trans border flood early warning mechanism is weak with India that causes the floods to go undetected. Unfortunately, our policies are relief centric and do not focus on disaster risk management, due to which natural calamities have become a frequent feature of the country.

Our Civil defense department is inefficient. The lack of capacity and resources is causing difficulties in the emergency response system putting burden on military relief forces. Stress on military is overarching and heavy reliance is on the relief and response equipment of the armed forces which is an ad hoc arrangement and not sustainable. The lack of aviation assets is an aspect that needs special attention since all reliance is on the armed forces and their aviation services in case of a calamity.

It is time that we make remedial measures and strategies of civil military cooperation a part of the disaster management, a tool to overcome the short comings of the system. Community early warning system should be upgraded and put in place. Effective collaboration should be established for the combined effective handling of the disasters and natural calamities and the devastation that it brings with itself. Military collaborations should enhance the civil capacity of quick response of community systems. Induction of skilled and trained human resource in rescue 1122 and other related departments would increase the skill needed and efficiency of the overall system. While we have a decentralized system of the disaster management, there needs to be district level setups that can operate at district level effectively. We need to have Climate Change monitoring section in the disaster management Department of every Headquarter along with a rescue and relief response committee for efficient response and relief efforts. For better monitoring and management of Climate Change related disasters, these awareness and advocacy initiatives are the need of the hour.

Rethinking National Security Policies in context of Climate Change by Dr. Qamar uz Zaman Chaudhry, EX DG Pakistan Meteorological Department

Despite all the work, a lot of research needs to be done to understand the threat of Climate Change. This will help make more accurate future projections. Temperature increase in Pakistan in the last 50 years has



been approximately 0.5 degree Celsius. The current data shows that by the end of next 100 years, this will aggravate further and could go up to 2-2.5 degree Celsius. Depending upon the economic setting of the country, these projections are subject to change. In a business environment, this could even go higher. The hazardous and devastating effects of the slow Climate Change in the form of increase in temperature cannot be ignored as it is affecting all the avenues of national policy and implementation.

Another threat Climate Change poses to the country is on its food production. If current trends of Climate Change continue, food production is expected to decrease by 10-15% in the next 30-50 years. This will create an environment of food insecurity which will directly impact livelihoods.

Pakistan is also now facing the threat of sea-level rise in its coastal areas. The sea-level rise in the coastal areas of Karachi is 1.5mm/year and by the end of this century a rise of 60 mm is projected. This rise will threaten not only the local infrastructure but also impact communities.

The policymakers have been talking about glacial melt due to Climate Change, however, in the actual planning; the threat is not being taken care of.

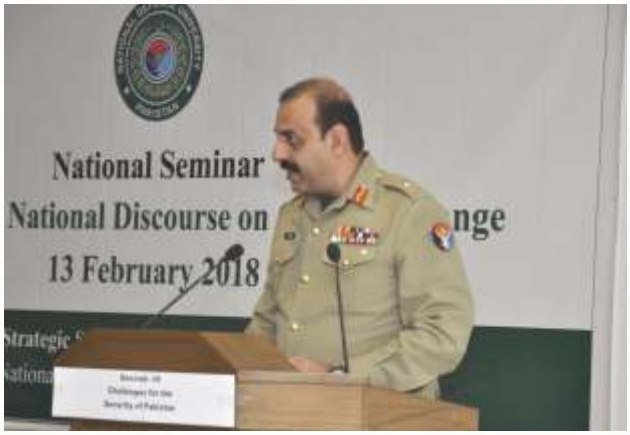
Population rise is further going to impact the already stressed resources of the country.

The increasing role of the national security institutions in the sphere of Climate Change management is very crucial. The role of security institutions should be highlighted and be made efficient in all ways. These institutes should not only focus on the management of immediate disasters but also the threat of disasters the Climate Change poses. In scenarios, where extreme weather events are to become more frequent, the role of these institutions needs to be redefined.

Challenges of Military Strategies Operational Doctrines and Capacities by Major General Aneequr Rehman, DG Ops and Plan, JSHQ

If a state is fragile and the society is not able to handle the effects of Climate Change, this incapability makes it vulnerable and weak from inside, which can be exploited by the enemy leaving the state in devastation.

Climate Change, environmental degrad-



ation and military security are inter-linked and create a security dilemma for countries which then resort to military action to enforce a plan for the national interest.

Climate Change is termed as a non-traditional security threat because of its indirect impacts on the society and the challenges that it creates for the countries in an environment of resource deprivation. If the state is fragile and the society is not able to cope with the climatic hazards it results in the environmental stress that is exploited by the hostile neighbour. This causes a collapse in the state structure and society, finally leading to an internal implosion or civil war.

The two historical examples that can help us understand the impact Climate Change can have on any nation are explained:-

Though 1971, East Pakistan separation was the result of many factors but environmental hazards played a huge rule in fuelling unrest amongst people. This was worsened by the lack of capacity of the government to deal with such a disaster effectively. It added to overall Perceived Relative Deprivation (PRD) factor of East Pakistanis since they were constantly exposed to natural hazards and were facing collateral damage to their lives and properties. Unsatisfactory efforts by the West Pakistan government during the previous disasters resulted in the unpopular dissatisfaction. The disaster of Bhola Cyclone became the catalyst event for the upcoming events of East Pakistan and its separation. It reminds us of the impact the environment can have on the geopolitics of ant region.

The second example of the impact of environmental degradation on military and governance is of 2010 floods in Pakistan. Being the most devastating of its kind since 1950, the 2010 floods affected almost 20 million people with an economic impact of more than $10 billion. The geography of the floods coincided with the geography of the ongoing war on terrorism. The instability and poverty with high numbers of unemployment rate at that time in Pakistan also coincided with the situation of floods and resulted in the dissatisfaction of the youth in particular and the stage was set for the hostile forces to exploit the situation against Pakistan. In august 2010, a report was submitted to the US congress which stated that the security and environmental concerns in Pakistan have the potential to affect not just the security of Pakistan but also the security of the international interest in the region. It will also affect the efforts of the regional as well as international players to fight the war on terror. Another report states that the environmental stresses on Pakistan have the potential to further weaken the already weakened Paki-

stan.

India also like other countries is in the process of evolving its national security policy which is still in draft form and a final security policy has still not been released. However, India does have a national action plan on Climate Change and identifies Climate Change as the non-traditional security threat. However, Indian Think Tanks have identified the threats perceived by the environment not just to its military capabilities but also its nuclear programs.

Pakistan's Climate Change policy perspective has shown satisfactory trajectory owing to the fact that the defence policy is being reviewed every year and new challenges and their remedial steps are added to it time to time. This constant review makes the overall operational policy perspective an efficient and adaptable one, meaning that the environmental and development strategies augment and support the defence in a constructive way.

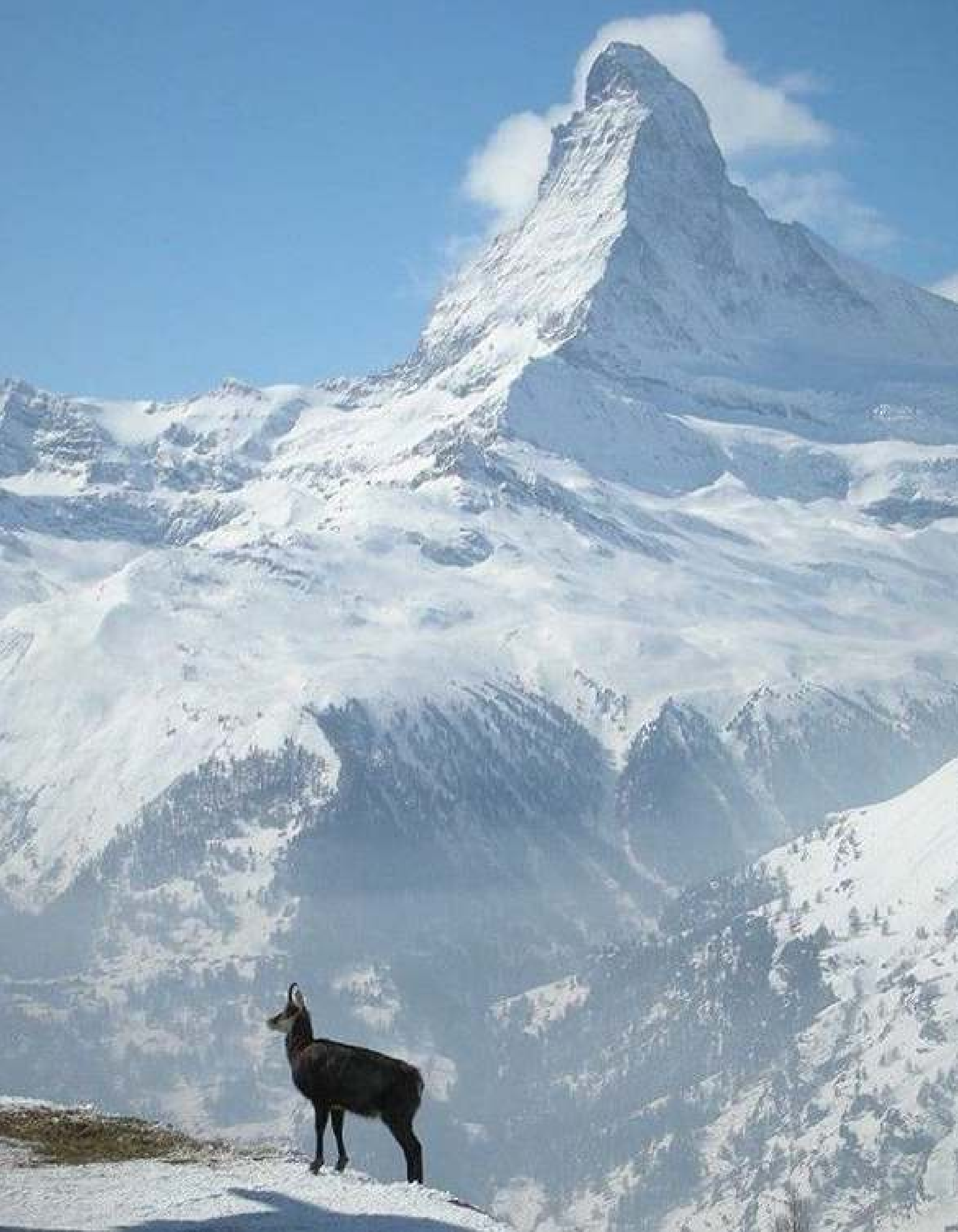
Any successful strategy is coordinated with the means and ends. Assessment at the Joint Staff Headquarters of Pakistan provides the evaluation of risks in the form of Climate Change impacts on the military operational domain. Any viable military strategy must factor in this crucial aspect of climate and environmental impacts on practical grounds. Military has an important role to play in issues related to natural as well as climate induced disasters.

In view of absence of National security vulnerability indexes, it is difficult to quantify in concrete terms the hazardous results of Climate Change in the national security. A wholesome military strategy must encompass two important components which include; deployment strategy and development strategy. There is a need to incorporate climate intelligence in military strategies plans along with forces which are assigned special climate protection and disaster relief roles which they can focus on before and during a natural emergency.

Evaluation of impact of Climate Change on land strategy, air and maritime is needed. War fighting and humanities based assistance should be improved in the zone of operation; because the bad effects of the natural disasters and Climate Change induced hurdles may reduce the operational ability, limiting the military range of operations. The development strategy of military should be developed according to geographic and climatic zones. Institutionalization of climate modelling techniques in military setups is also the need of time in order to increase the efficiency and enhancement of strategic communication.

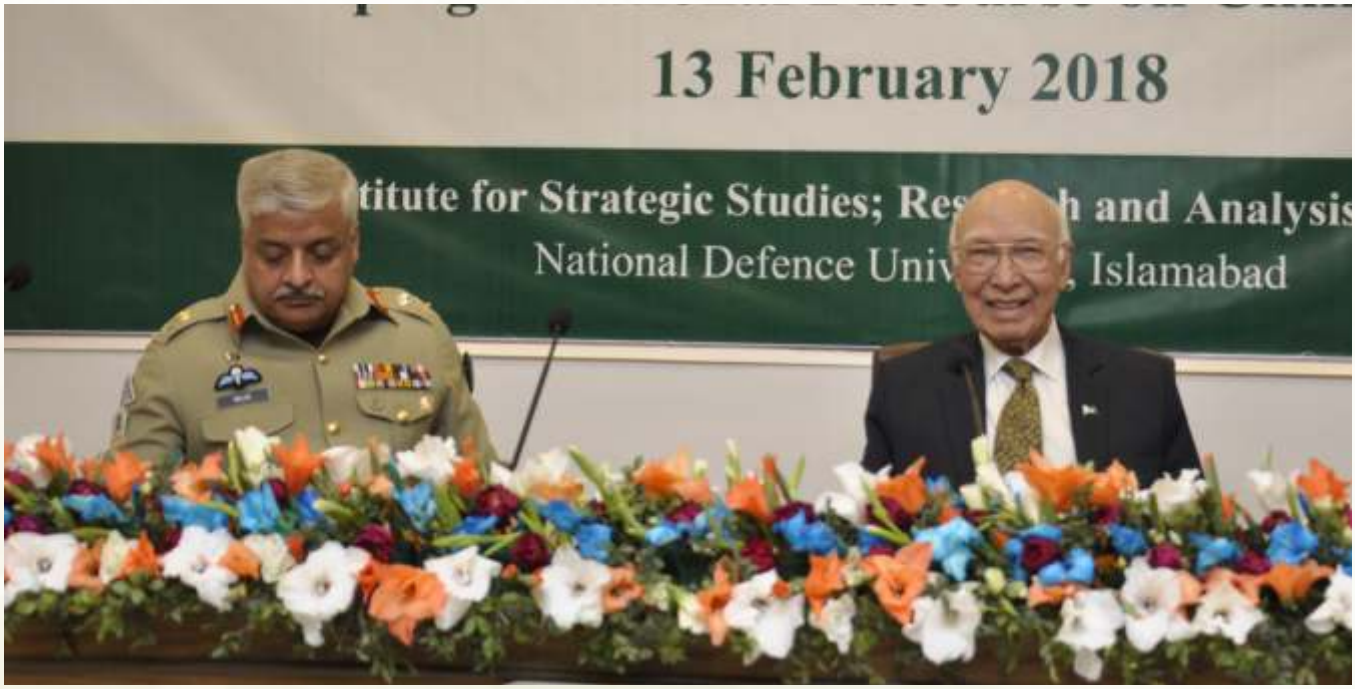
Briefly highlighting the way out, the speaker deliberated upon a broad framework to address the issues at hand. This framework included an integrated action by the national security policy, defence policy, joint defence policy and internal policy. National vulnerability profile may be created according to indexes related to food security, Climate Change impact, demography, human devel-

opmental index, healthcare and proneness to environment hazards. Climate change is a non-linear threat so contingency plan and war gaming is the need of time. Armed forces are adapting themselves as climate warriors, mitigating the threats and alleviating the devastating effects of Climate Change while attempting to counter the climate and disaster implications.



Closing Session

Closing Session

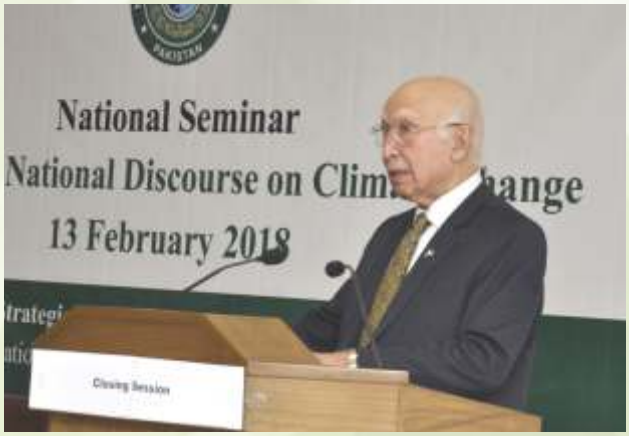


Closing address by Mr.Sartaj Aziz, Deputy Chairman Planning Commission

Climate Change has emerged as a very significant issue for Pakistan because of its impact on the security and development of the country. The Chief Guest highlighted, how the recommendations from the deliberative exercise hold great value and relevance for policy makers, as it would feed into the Government's priority on Climate Change.

It is important to realize that the problems involved are not only complex but also interlinked and require an in depth understanding of the issues. Pakistan is 135th in the list of global emitters of global GHG emissions every year which means we are least responsible for global Climate Change but paradoxically we are ranked 7th on the Global Climate Risk Index.

It has also been projected that the rate of global Climate Change will be more rapid in the coming 50 years than the last few centuries. Our river flows are heavily dependent upon glacial melt (41%), snow melt (22%) and rainfall (27%). The glacial



area is projected to decrease by at least 20% by 2050. Moreover, temperature increase is projected to go up by 2 or even 3 degrees centigrade by 2050.

While giving the example of Cape Town, the chief guest highlighted that due to drought caused by Climate Change, water level in the dams supplying drinking water to the city of Cape Town has dropped. City is planning to declare “Day Zero” in less than 3 months, after which water taps in houses and businesses will be turned off until rain comes. The city's 4 million residents will have to collect water from 200 collection points under army's supervision. It is our collective responsibility to prevent such an alarming crisis in Pakistan. The general impression that Pakistan has not yet developed a coherent strategy to meet climate threat is not correct. A number of policy and operational measures have already been adopted like the:-

- Environment Division converted into Ministry of Climate Change, with Environment and Climate Change Departments in all the provincial governments.
- Environmental Protection Agency set up at the Federal level with Provincial Protection Agencies in each Province.

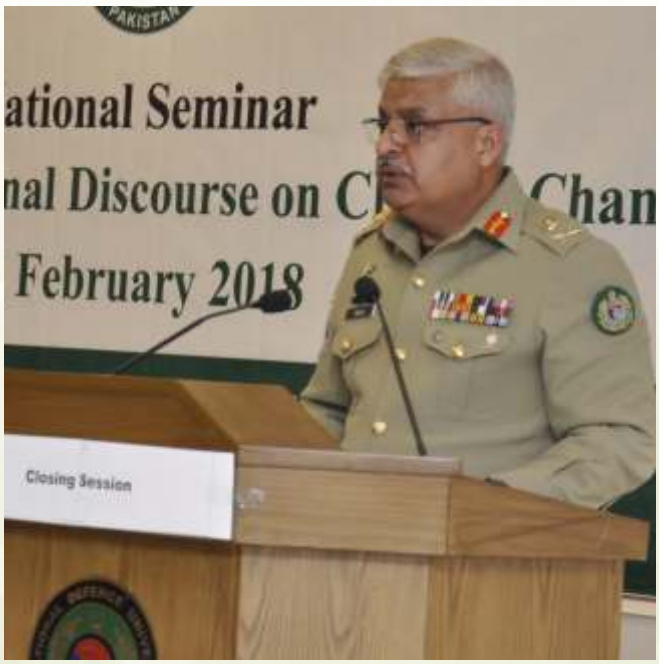
The new law provides for a National Climate Council chaired by the Prime Minister and a National Climate Authority as the core institutional mechanism to evolve mitigation and adaptation strategies and prepare, for international financing, projects and programs. The Law also creates a Climate Change Fund to finance small scale activities and projects at the local level.

National Disaster Management Agency has been working for many years at Federal and Provincial levels. The role of these Agencies after the 2005 Earthquake and the massive floods of 2010 and 2011 has been widely acknowledged. The most important segment of any Climate Change Strategy is water. An Inter-Provincial Committee is currently in session to evolve a National Water Policy. Pakistan draws 104 Million Acre Feet (MAF) of water from the three rivers. In addition, it pumps out another 52 million-acre feet of water from 1 million tube wells. Total of 16 million hectares of land is irrigated which is two third of our total cultivable area of 23 million hectares.

The 12th Five Year Plan has been prepared. High priority is being given to building sustainable food systems compatible with Climate Change. The speaker highlighted how the policy makers are supporting most vulnerable communities living in arid and semi-arid regions of Balochistan, South Punjab, Sindh, Khyber Pakhtunkhwa, Gilgit Balistan and FATA through building infrastructure and more efficient irrigation systems. The Provincial Governments have already embarked on highly ambitious forestation programs. These are fully supported through supplementary federal funding. Such an ambitious program will require stronger political support and larger resources.

Considering Pakistan's extreme vulnerability to Climate Change, this challenge must be met with resolute determination as an important part of national security.

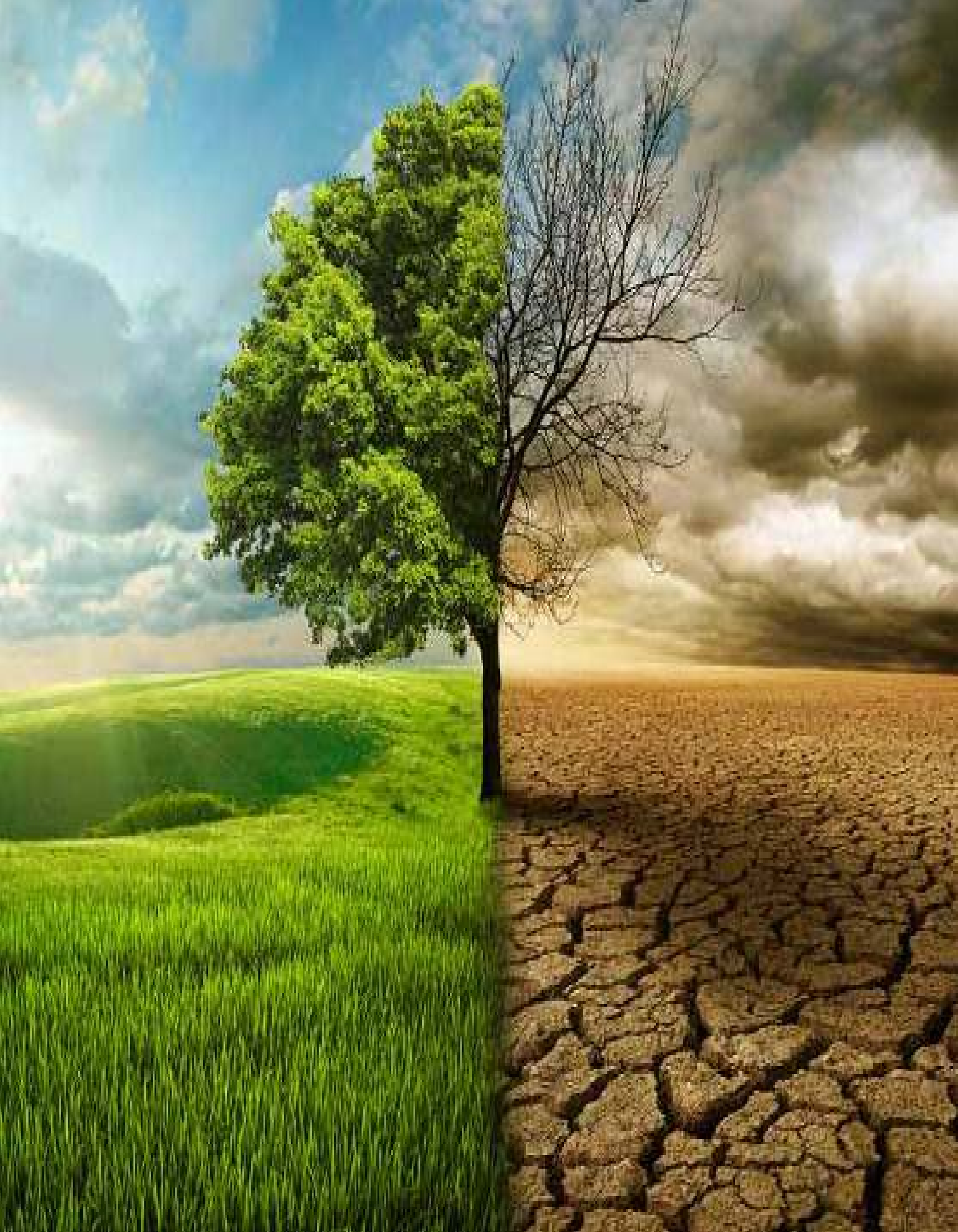
Vote of Thanks by President NDU



President NDU extended his gratitude and thanks to the honorable Chief Guest Mr. Sartaj Aziz for sparing his time and gracing the occasion. Salient points of President's speech are appended below:

- Pakistan makes less than 1% contribution to total global GHG emissions, yet it is ranked among the top 10 countries most vulnerable to the effects of Climate Change. Its high vulnerability coupled with very low technical and financial capacity to adapt to its adverse impacts makes it more susceptible to threats such as resource depletion, natural disasters and environmental degradation. This has direct economic consequences for the country since its economy is largely agriculture based.
- Policy makers should thus assist the government for sustainable economic growth by appropriately addressing the challenges posed by Climate Change, the threats to Pakistan's water, food and energy security while making efforts to contribute to the international efforts to check Climate. The government should also strive to increase the capacity of national organizations and to make full use of new developments in science and technology for effectively addressing the menace; and identify the need for international cooperation and support for addressing all issues related to Climate Change.
- The seminar on “Developing a national discourse on Climate Change” was one more milestone in the series of deliberative exercises undertaken at NDU. The range and quality of inputs were indeed thought-provoking and stimulating. The process was carried out with a clinical and constructive approach.
- He thanked valued guests who joined the seminar from across the country and spared time from their busy schedules and honored this occasion. He extended a very hearty vote of thanks to all speakers and participants who shared their valuable findings, opinions and recom-

mendations. He ensured that recommendations made during the seminar would surely provide strategic/policy guidelines and help in outlining a mechanism to enhance and strengthen Pakistan's international position on Climate Change.



Post Roundtable Report

"Developing a National Discourse on Climate Change and National Security"

As a conclusion to the seminar the Roundtable titled, "Developing a National discourse on Climate Change and National Security" was held on 14th February. The aim was to refine the recommendations of the seminar and get the valuable input from experts, stakeholders and policy makers.

The Roundtable was divided into two sessions. In the first part three nominated participants made presentations on the following topics:

- Climate Change: Challenges for Strategies, Operational Doctrines and Capacities of the Security Sector
- Reshaping the Security Landscape: Energy, Food and Water Resources of Pakistan and Beyond
- Climate Change Governance as a Cornerstone of Pakistan's Planning process in the coming years

In the second part there was an Interactive Discussion in which the participants discussed matters of Climate threats and its impact on National Security.

Welcome Remarks by DG ISSRA, Maj Gen Muhammad Samrez Salik HI (M)

DG ISSRA welcomed the participants to the Roundtable. He stated a report published by World Bank in 2006, according to which the per capita availability of river water, which was 5,650 cubic meter/y in 1951 and 1000 cubic meter/y in 2010, is expected to decline further to 800 cubic meter/y in 2026. This will have direct economic impacts since water is essential for the country's economic growth as agriculture occupies a large sector of Pakistan's economy.

Climate Change in Pakistan is thus causing; glacial retreat and haphazard snow melt, variability of monsoon, watershed degradation, sea-water intrusion, salinization of coastal areas, loss of biodiversity, proliferation of water borne diseases, increase in frequency and intensity of extreme weather and precipitation events.

Unfortunately, a lacking national discourse on Climate Change and the unawareness of the masses has aggravated the issue. With our politicians locked in self-centred power struggle, building widespread resilience against climate change is just not getting the attention it deserves.

He hoped that the inputs during this roundtable will unfold answers to the outlined queries and enable the policy makers to devise a way forward.

Presentation 1: Climate Change: Challenges for Strategies, Operational Doctrines and Capacities of the Security Sector by Lt Gen (Retd) Tariq Waseem Ghazi

While addressing the audience, the General officer emphasized that our focus should be on vital areas and putting time lines for the implementation of recommendations that are made on regular basis on different platforms on Climate Change concerns.

The necessity to counter global issues like Climate Change lacks inter-institutional trust, dissemination of information and analysis of data. While highlighting impacts of Climate Change on military strategies/doctrines, he asserted that many seminars have been held previously on the same subject by various platforms providing detailed course of actions for armed forces during the crisis. We need to find out answers of the significant questions such as; is the threat of water shortage a real contemporary issue? Are we provided with authentic reliable data? How data management is carried out among institutions and concerned organizations? What would be the impact on nations? And what are the defensive plans?

Many committees have been made till now but none has given any remarkable outcome. In terms of what we need to do beyond these discussions is expanding the work both horizontally and vertically. Unfortunately, vertically this has been only traveled down to Bahawalpur Corps and this was only due to Lt Gen Javed Iqbal's efforts which he started when he was President NDU. He referred to a two-day seminar which was held in Bahawalpur where implications of Climate Change were discussed even at tactical level. At that time emphasis was on creating a team of three experts on the subject which would go around all the Corps Headquarters to spread the word on the subject which probably could not materialize due to postings of concerned officers from Bahawalpur.

The emphasized that, it is essential to understand that what data are we provided with and how much of this data is translatable to useful work. He indicated that, Global Military Advisory Council has generated a report to respond to Climate Change challenges and has suggested military role in

making eco-friendly environment. Militaries in Europe are transforming their fighting manners and making them cleaner than before. This transformation has turned into legislation and that legislation would be a binding on the countries across the globe. Eventually future wars will be molded according to eco-friendly theory.

He suggested that there should be awareness workshops and interactive sessions to analyze data that is provided by climate related organizations. Data analysis of one such case could be on how glaciers are melting and causing increased water flows in the rivers and by what time the overflow would start affecting? Can a desert area be made greener? In such a changing environment what would be the rate of intra-region migration? What effect will it have on campaigning season between India and Pakistan if winter is delayed?

He emphasized that the armed forces need to be extra vigilant as Climate Change would adversely impact the existing strategies and infrastructure the most. Armed forces would need more high tech equipment operable in adverse Climate environment.

Presentation 2: Reshaping the Security Landscape: Energy, Food and Water Resources of Pakistan and Beyond by Mr. Ali Tauqeer Sheikh

Mr. Ali Touqeer Sheikh asserted that the Climate Change policy is a wish list. Policy makers need to think differently in order to effectively counter the growing threat of Climate Change. The speaker suggested to address the following domains:-

1. Go to Ground-Zero

A shift in focus from the federal to the provincial level with special emphasis on the villages and rural areas is needed. For this, the heart of the financial allocation system needs to be addressed and revised so that development becomes compatible with sustainability.For better results the departments at local levels should be developed and revolutionized. PC-1 form of the government of Pakistan Planning Commission which is a proforma for development projects should be reviewed and reassessed. The recurrence of extreme natural events is not only draining our national income but also exhausting are resources. Therefore, it is time we make Climate Change a developmental issue and begin making climate smart investments.

2. Mitigation Measures

Unfortunately, the lethargy of the policy makers and stakeholders has impeded the implementation of the 3Rs i.e. Reduce, Recycle and Reuse. If the nation begins with the implementation of the 3Rs, it will not only reduce the cost of living but also save our resources. Fossil fuel technology has very high costs to the environment and health of individuals. Alternate renewable energy resources should be provided to the nation

which will not only save the environment but also create more than a million job opportunities. The government and individuals both need to resolutely take up mitigation measures and respond to them with seriousness.

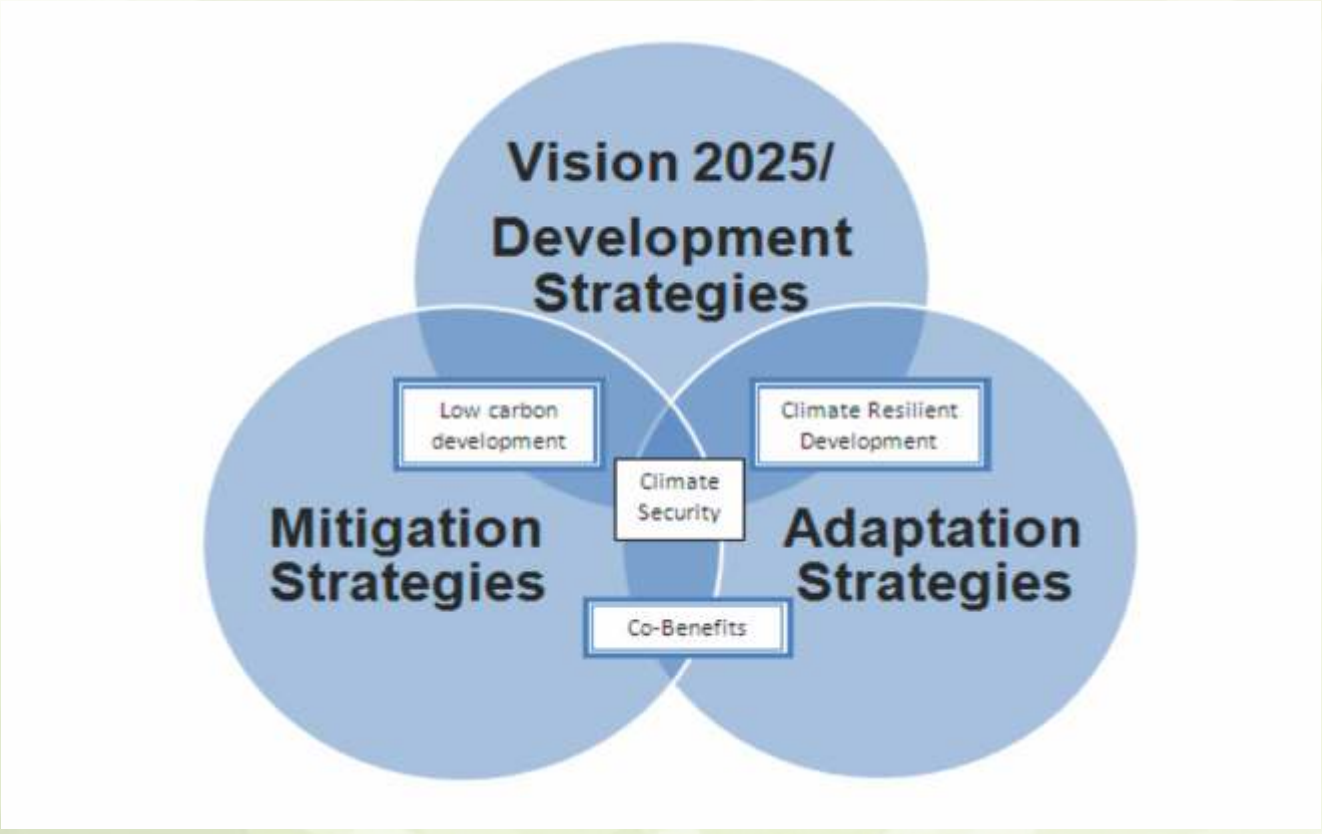
3. International Integration

In the year 1992, Pakistan was chairing the earth summit. At present, Pakistan is a non-participating member. The growing isolation of Pakistan on the international front is a major disadvantage. The changing geo-political trends demand that Pakistan is strongly integrated with the international community and Climate Change provides this opportunity. Alignments with groups and a shift towards green technology will help the country end its isolation.

CPEC in this model is of significance since China has emerged as a global leader and development in China has been rapid. This provides a vast carbon market that needs to be exploited. Since Pakistan is China's most immediate neighbor, Pakistan can use Climate Changes an opportunity to take relations beyond short-term and CPEC can become clean energy corridor.

The exchange of green technologies can also reframe the Climate Change issue of Pakistan while helping it align with the Counter Terrorism Department, thus help the country build a new narrative.

In addition, adaptation strategies should be formulated under the following model:



Presentation 3: Climate Change Governance as a Cornerstone of Pakistan's Planning process in the coming years by Dr. Safdar A. Sohail

The vision 2025 outlines governance, institutional reform and modernization of the public sector as important strategies to address the hindering issues like Climate Change. The main focus of the Vision includes:

- Sustained Indigenous and Inclusive Growth
- Human and Social Capital
- Transport, Infrastructure and Connectivity
- Knowledge Economy through Value Addition
- Private Sector Entrepreneurship
- Water and Food Resources

It was highlighted that the Ministry of Planning Development and Reform has been assigned the task of promoting and facilitating the Governance Reform process since December 2013.

The aim is to promote the in-depth studies and consultations in five areas i.e. recruitment, performance management, compensation, institutional structures and training. To achieve this, performance contracts were signed with 11 ministries with a mission to introduce annual performance. This can further strengthen the link between performance and career growth. The draft performance contracts were prepared in consultation with the Ministries in 2015.

In this milieu, to achieve the objectives of climate change governance, it has been decided that all the relevant ministries will be provided a focal person assisted by Human Resource (HR) managers (Grade 20) for 3 years (MP3) for the implementation of the performance contracts. Under this, all the ministries are to get International Standards Organization (ISO) certification within one year.

It was explained that the “Divisional Performance Contract” deals with a range of ideas, such as, vision, policy outcomes and evaluation of the entire program. A move to enhance the Human Resource Managers (HRM) capacity in Federal Ministries and Divisions includes the placement of HRM (equivalent to Grade 20) at eleven target ministries for providing full-spectrum technical support to HR functions as well as their performance. These may be institutionally linked to the Establishment Division (future HOD Division, along the lines of Financial Advisors linked to the Ministry of Finance). While discussing the governance reform experience of Ministry of Planing Development Reform, it was brought out that limited progress has been made during the last 4 years despite 200 plus meetings and extensive consultations and engagements with

the Ministries.

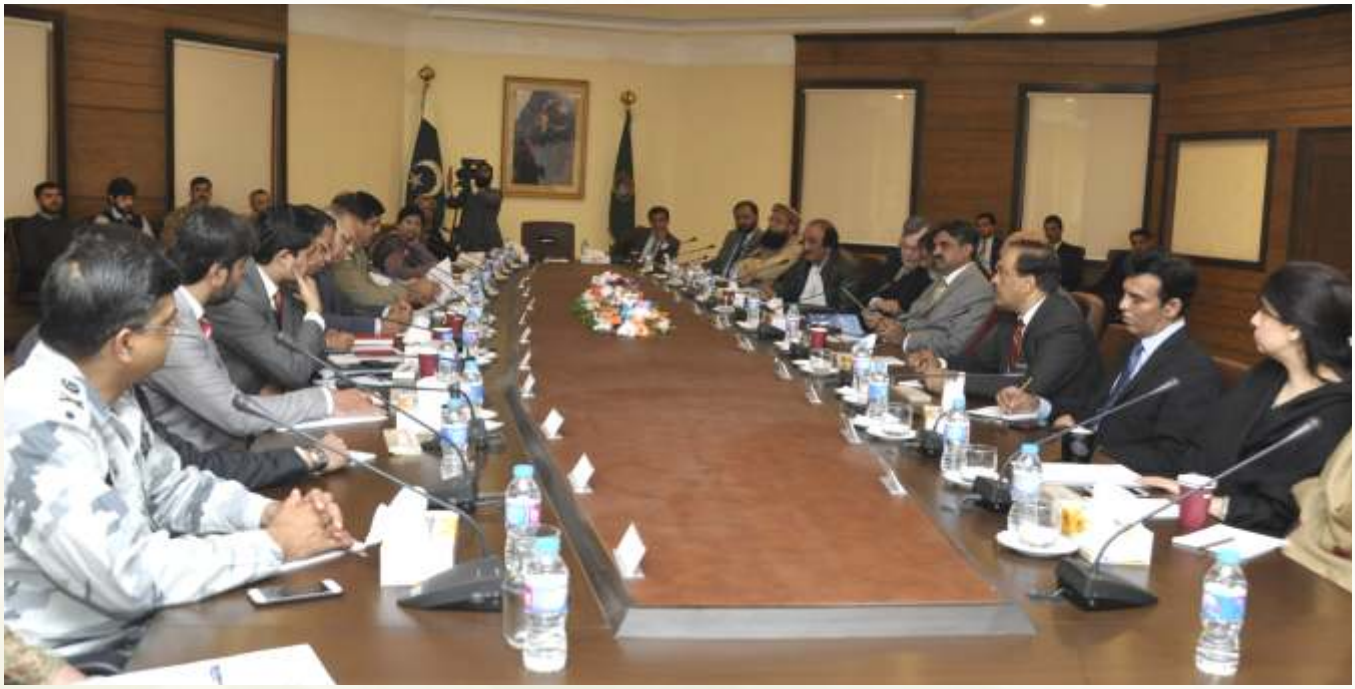
Governance of Social Policy has worsened with deteriorating Human Development Index. Political Economy of decision making also needs to be addressed because it has been realized that although Institutional Reforms at the level of Ministry/Organization are important but have certain limitations. Moreover, formulation of 12th Five Year Plan for sound Climate Change Governance is being seen as a new opportunity. This plan ranges from 2018 to 2023 and includes the following socio-economic objectives;

- Steadily strengthening of policy and regulatory environment for fostering deeper, broader and competitive markets in all fields of human activity
- Modernizing administrative and financial management in public sector in Pakistan
- Efficient governance of urban spaces with a view to better manage density, commerce, mobility, openness and tolerance in the cities while taking Islamabad Capital Territory as a venue for launching the pilot project.
- Transform the Local Governments to support community growth and improved public service delivery.

Building trust and creation of a 'caring society' on the foundations provided under the 18th amendment along with improving innovation systems needs to be at the priority in the country. The explored way forward in the discourse recommends that Pakistan should put Social Policy above the Economic Policy as it would help to foster Environmental Protection.

Finally, role of Economic Coordination Committee should be more assertive and robust. The state needs to revisit State-Market Relationship since the national capacity to combat Climate Change vulnerabilities depends more on 'Governance Solutions and their Capacity to be responsive' than financial resources being injected into the programs. It should be revisited to discourage Market Competition where Governance is weak.

Interactive Discussion

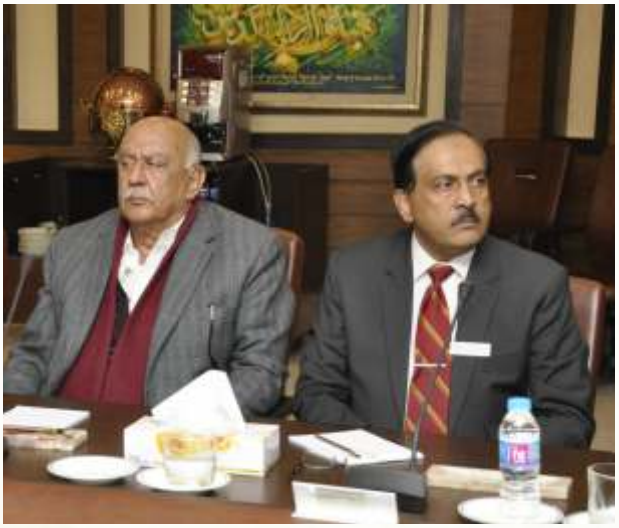


An intense debate took place after three presentations. Following points came under discussion:-

- The human actions are directly linked with the environment. Almost every human action results in the depletion of environment. On the other hand, elites are benefitting from the environmental degradation, so the prime question is what the balancing factor between the environment and the human action is? The answer lies in the sustainable development which encompasses developmental effects on the environment.
- The shifting US role in terms of Climate Change is based upon Trump's repositioning keeping in view its domestic audience. The US policies are creating a leadership vacuum for China which has certain implications. The geopolitics of our region is directly linked to Climate Change and national security discourse.
- In terms of China's role as global leader on Climate Change, the US policy to withdraw from Paris Agreement offers four options. Firstly, since the US does not recognize the realities and threats of Climate Change, therefore it may be financially penalized. This however, would be an extreme scenario and perhaps not feasible. Second, is to follow the American footprints on the premise that since the US is not following any obligation therefore we would also not follow any of the rules. Third, is

ignoring America and keep on doing what we are already doing as climate change is slowly and gradually affecting us. The last option could be to fill the gap which US has created. It is noteworthy that the US and even the EU have left the leadership role in terms of climate change and China is filling the vacuum.

- Chinese government's initiative of 'capping the coal-based power plants is a step forward in this regard where the Chinese government is assessing the side effects of its coal power plants. In Pakistan, there has also been a principle decision to cap all the coal power plants. Therefore, it is prime time to renew our negotiations with China and demand for clean energy solutions instead of coal power plants. China's achievements in solar energy are marvelous. The important benefit of the solar energy is that it does not require long transmission lines. So, the clean energy can be produced indigenously. In long term plans, we can focus on solar energy for both civilian as well as military use.
- The contemporary global environment is transforming rapidly, and now the biggest problem is financing the global concerns, for example, the Green Climate Fund (GCF). Since, funding of mega projects like dams has become an issue, therefore the situation demands for public private partnership especially in the energy projects. Moreover, the cost for climate change mitigation and adaptation is increasing day by day therefore we must carry out the future projections. These projections should also include the share of armed forces which, in the longer run, will help Pakistan in attracting funds to mitigate the effects of climate change.
- The discourse on climate change can be categorized into three layers namely; science, economics and politics. Pakistan must build its knowledge base to respond to the effects of Climate Change. On the other hand, foreign policy of a state is directly determined by its domestic situation and same is the case with Pakistan which is currently facing social governance problems. Climate Change is a threat multiplier which means that existing problems will increase if we are not ready to mitigate the effects of climate change. For this, Pakistan should try to overcome its social governance problems which also then translate into its foreign policy.
- On the coal issue, there are strong voices against the coal-based power plants, but it does not mean signing off the sovereign rights of a state. In the development economics, everything must be analyzed in perspective. Today, we are living in a complex world where states are being incentivized to reduce the global carbon emissions. We can envision some projects in the global



finance market which can have a price tag and for this, we must negotiate things incrementally. In Pakistan, energy deficiency has been suppressing the growth rate which we have overcome with the help of coal-based power plants. In the future, the most important question would be that how far the clean energy projects will attract the investment in Pakistan. We must devise specific options for energy production.

- Climate Change is directly linked with the security. It can result into forced migration, resource scarcity and extreme weather conditions. In Pakistan, the significant issue is how to deal with the extreme conditions. Whenever there is a natural calamity, armed forces are involved in rescue and reconstruction efforts. So, it is likely that pressure on armed forces will increase because of increased calamities due to Climate Change. This would directly affect the capacity of war fighting of our armed forces. In this scenario, we must build resilience against the climate change and civil institutions should be developed to mitigate the effects of any catastrophic event.
- Climate change has a direct bearing on the defence infrastructure. Keeping this in view, authorities have taken care of tsunamis and sea-level rise in the master plan of Gwadar and Sir Creek. The rising temperature in Arabian Sea has serious visible implications in the Bay of Bengal. In Pakistan, Bahawalpur Corps is facing problems due to the climate change and therefore they have conducted a comprehensive study on the effects of Climate Change. On the global level, Paris Agreement has been drafted after the five reports clearly indicating the devastating effects of Climate Change. Contrarily, the US government is in a denial mode, but Pakistan should build its case as an affectee of Climate Change. Moreover, since we cannot control Climate Change, we must work on forecasting the scenarios. We should have a linear projection of the time and temperature rise in our region. For this, both the civilian and military planners should sit and work together to mitigate its effects.
- We have to develop threat scenarios on both eastern and western borders keeping in view the effects of climate change. Based on these scenarios, we must analyze how our systems, proce-

dures and equipment will be affected and would change. The given environment necessitates action especially in places like Siachen. In deserts, we need treatment plants to transform the brackish water into drinking water. In terms of equipment, the attack helicopters require certain temperature to operate. As the global temperature is rising, some of the areas will go beyond its ceiling and therefore we must have to change the military equipment inventory keeping in view the effects of Climate Change.

- In terms of Climate Change, Pakistan is facing problems on both external as well as internal front. Water is the most critical resource for Pakistan which is a geo-physical reality of our region as the whole of the region has flourished because of water based agriculture. But there is no external mechanism to share information regarding water availability, quality and quantity. Water, a vital component of human security, is currently facing serious stress and strain because of Climate Change.

- On the internal front, Climate Change is seriously affecting the human development index. In sum, climate has emerged as a crucial factor which does not allow consolidating our efforts for human security and development. Contrarily, we are still unable to devise any water policy and there is also no mechanism of land zoning keeping in

view the dire consequences of Climate Change. The root cause of our problems is 'aid syndrome' which does not allow us to generate our own resources. Therefore, we must work to generate and monitor our own resources to develop responses against the effects of Climate Change.

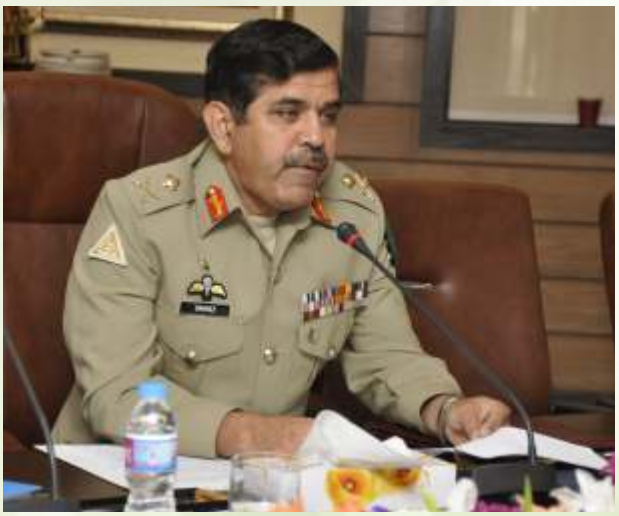
- Dams such as Diamer Bhasha, which Pakistan is planning to build, cannot serve as flood protection tools since they are located upstream. These dams will feed on snow and glacial melt. Therefore, such upstream dams cannot protect against floods as flooding is caused due to heavy monsoon rains. For flood protection we need more dams such as Mangla and Tarbela downstream.

- It is pertinent to mention that future is always shaped in a fashion which is suitable to the nation and for that purpose academicians play a pivotal role. In contrast, Pakistan's development agenda is inspired by 'Vision 2025'

which is economic agenda in nature and does not include climate change. Therefore, the educational institutes of Pakistan have emerged as degree producing instead of 'knowledge production'. With Climate Change, as an important discipline, is missing in our universities, how can we prepare our nation against it? So, we must review the national 'vision' statement in a manner that we can prepare our future generation against the effects of Climate Change.

- One can only respond to the situation if correct information is available. Unfortunately, this is not the case with Climate Change and its effects in Pakistan. The researchers lack basic data of water flows and its availability vis-à-vis demand. With the availability of advanced technology, such information can be made easily available to the academicians and researchers so that they can draw future projections. In terms of response, we must understand the fact that only indigenous solutions can resolve our problems. Moreover, one cannot think of indigenization till the time fact sheet is not available to comprehend the threat. For this, we should use our graduates and a linkage must be established between the educational institutions and the industry so that feasible solutions can be developed.
- Blame game is the easiest thing in the discourse of Climate Change. For example, the smog issue in central Punjab. It should be understood that smog is our indigenous problem. The heavily industrialized zones of Lahore, Sheikhupura, Gujranwala and Faisalabad are producing large quantity of Sulfur and fluoride which is resultantly producing smog and creating serious environmental problems in the region.

Vote of Thanks



At the end, DG ISSRA, Major General Muhammad Samrez Salik HI (M) thanked the participants and guest speakers. He appreciated the positive

contributions made by all participants and highlighted that the Roundtable had been highly rewarding and thought provoking. The recommendations made in these two days surely provided legislative guidelines and will help in devising a mechanism to enhance and strengthen Pakistan's National discourse on Climate Change.

List of Participants

- Lt Gen Tariq Waseem Ghazi, HI (M), Retd
- Mr. Ali Tauqeer Sheikh
- Dr. Safdar A. Sohail
- Ex-Ambassador Shafqat Kakakhel (Chairperson SDPI)
- Mr. Syed Abu Ahmed Akif, (Secretary, IPC)
- Dr. Ghulam Rasul (Director General, Pakistan Meteorological Department)
- Dr. Zafar Iqbal Qadir (Ex-Chairman NDMA)
- Ms. Farzana, MLA, AJ&K
- Maj Gen Asghar Nawaz (Retd), HI (M) Ex-Chairman NDMA
- Mr. Sher Zaman Khan (Chairman IRSA)
- Ms. Aisha khan (Founder and CEO of the Mountain and Glacier Protection Organization MGPO)
- Dr. Abid Qaiyum Suleri, ED, SDPI, Islamabad
- Brig Fayaz Shah, (Retd), Ph.d Scholar on Climate Change (NDMA)
- Dr. Muhammad Arshad, HoD Environmental Sciences NUST, Islamabad
- Dr. Shaheen Akhtar, Associate Professor IR Department, FCS
- Mr. Muhammad Omar, Dir UN-II, MoFA, Islamabad
- Mr. Khubaib Abuzar, Senior Assistant Professor Bahria University Islamabad
- Dr. Muhammad Nauman Ahmad, Assistant Professor, Agricultural University Peshawar

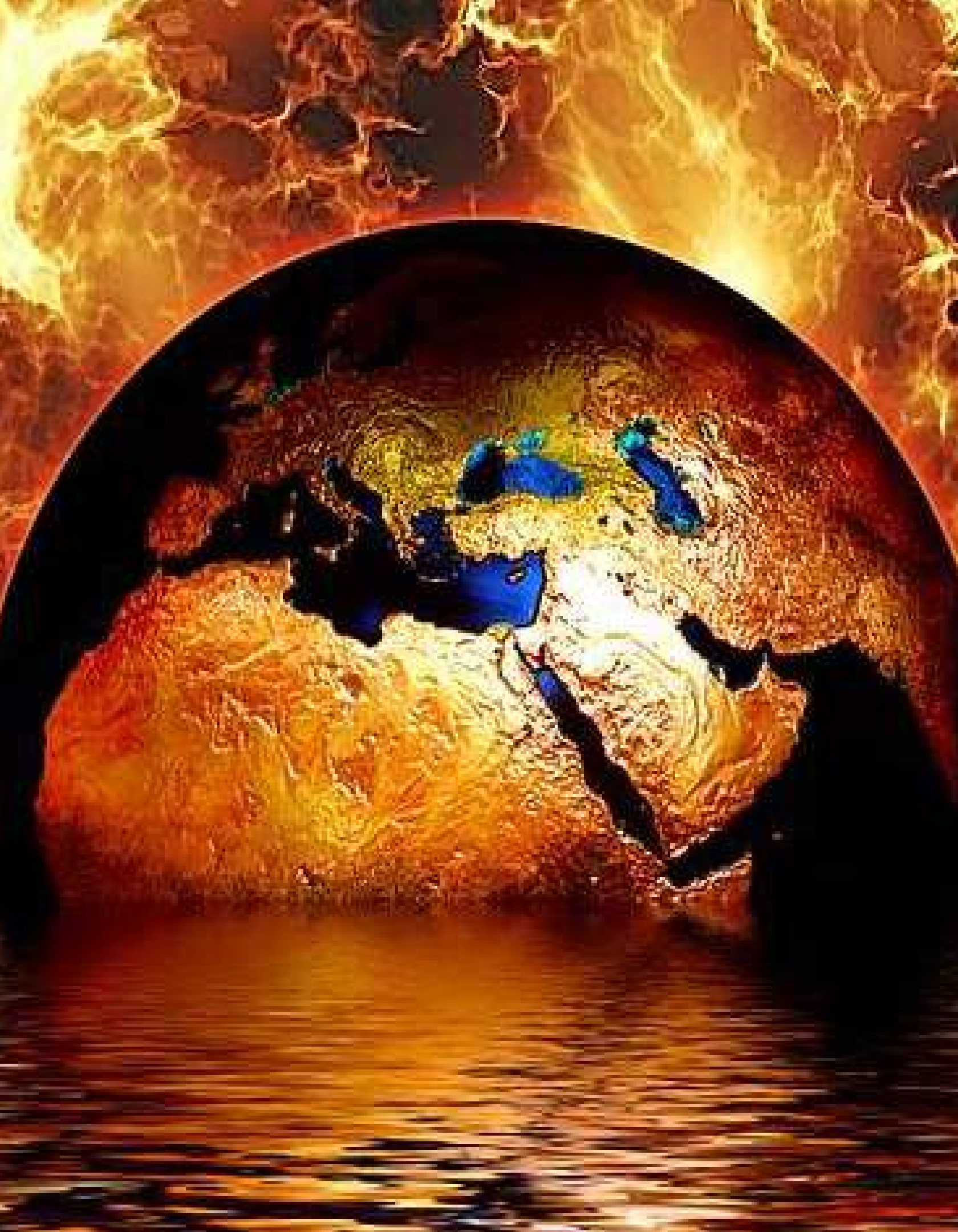
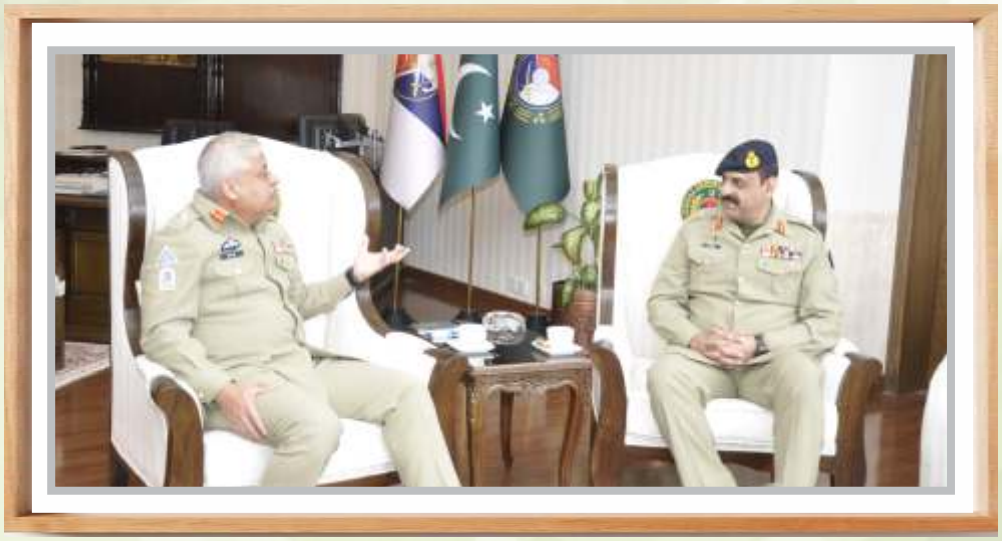
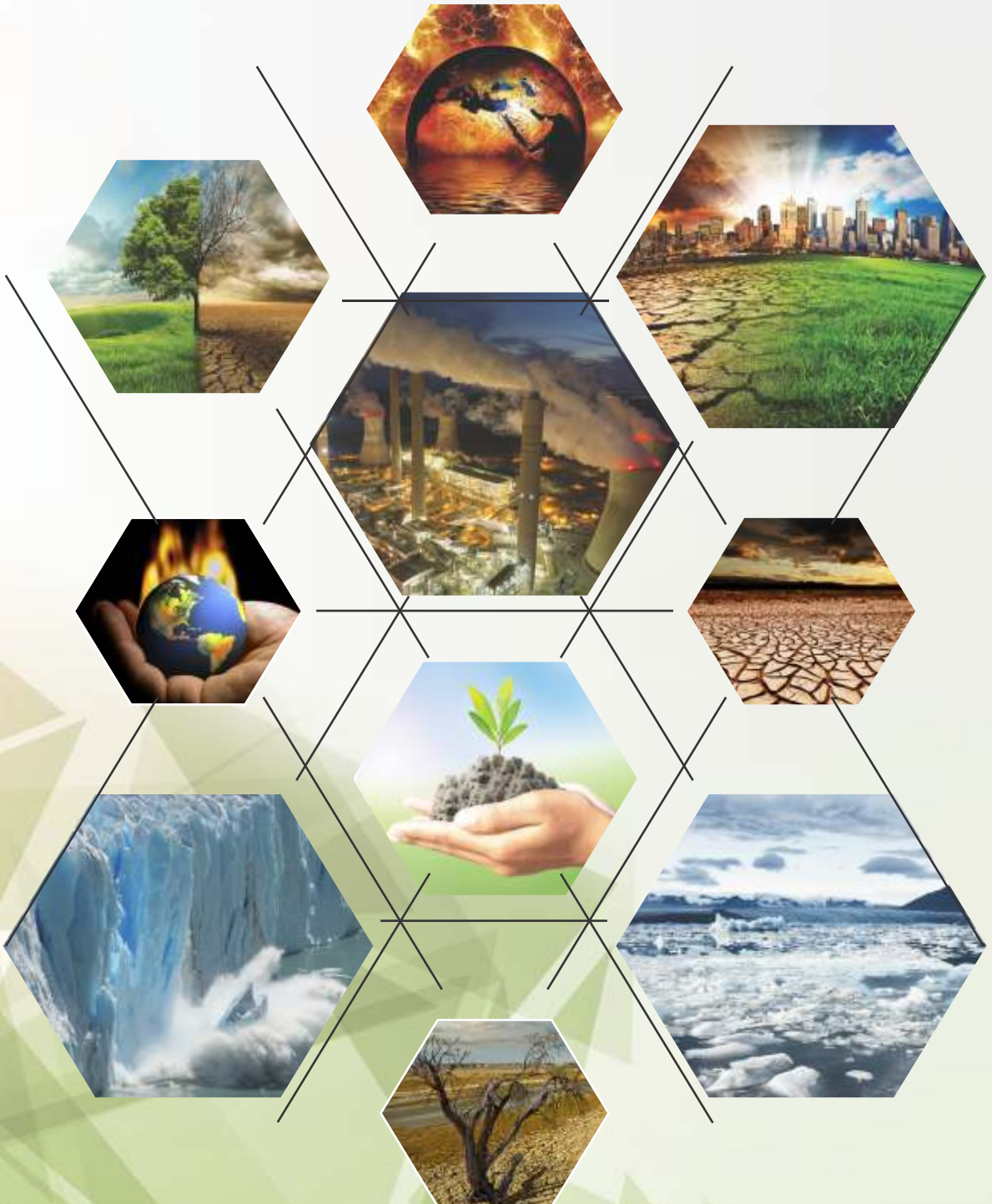


Photo Gallery

Photo Gallery




National Seminar



National Defence University E-9, Islamabad.
www.ndu.edu.pk