Chapter 16

# Climate Change

Pakistan is vulnerable to the effects of climate change which has occurred due to rapid industrialization with substantial geopolitical consequences. As things stand, the country is at a crossroads for a much warmer world. According to German Watch, Pakistan has been ranked in top ten of the countries most affected by climate change in the past 20 years. The reasons behind include the impact of back-to-back floods since 2010, the worst drought episode (1998-2002) as well as more recent droughts in Tharparkar and Cholistan, the intense heat wave in Karachi (in Southern Pakistan generally) in July 2015, severe windstorms in Islamabad in June 2016, increased cyclonic activity and increased incidences of landslides and Glacial Lake Outburst Floods (GLOFs) in the northern parts of the country.

Pakistan's climate change concerns include increased variability of monsoons, the likely impact of receding Hindu Kush-Karakoram-Himalayan (HKH) glaciers due to global warming and carbon soot deposits from trans-boundary pollution sources, threatening water inflows into Indus River System (IRS), severe water-stressed conditions particularly in arid and semi-arid regions impacting agriculture and livestock production negatively, decreasing forest cover and increased level of saline water in the Indus delta also adversely affecting coastal agriculture, mangroves and breeding grounds of fish.

**Box-I: Water sector challenges in the Indus Basin and impact of climate change**

Food and Agriculture Organization (FAO) took stock of Pakistan's water resource availability, delineating water supply system and its sources including precipitation and river flows and the impact of increasing climatic variability on the water supply system. The focus was on the current water usage and requirements in the agricultural sector and how changing climatic conditions will affect the consumption patterns. With inflows expected to become more variable in the coming years, the severity of climatic extremities will become more pronounced, driving up water demands in addition to the demand increase from a rising population and urbanization. Over extraction of groundwater resources is also disturbing the water calculus and pushing the country towards a critical demand-supply gap.

Pakistan's water sector remains vulnerable to the impacts of climate change. To ensure that Pakistan is adequately prepared to deal with the changing climatic realities, it is important to understand the nexus between water availability, agricultural productivity and climatic variability. The work has endeavoured to highlight the same indicating the existing availability of water based on a single river system which is Indus Basin System and its tributaries; future projections of water requirements for crops, livestock, forest, rangelands, ecological and municipal sectors and the challenges Pakistan faces in accommodating the increasing demand for water from competing sectors. Further, limited water conservation practices that are contributing towards the degradation of water quality and loss.

In light of the analysis conducted, it is clear that due to competing pressures of water demand from different sectors and a widening demand-supply gap, there is a need to guide the shift from irrigation to water management in order to address the challenges that come with increasing climatic variability and water scarcity. Some key recommendations are proposed signalling the need to adopt a more holistic approach towards water management and conservation, which takes into account the available resources, its usage, challenges and projected water requirements as well as future course of action to ensure that Pakistan is able to boost its agricultural productivity without drying out its water resources.

Source: FAO Pakistan report on water availability, use and challenges in Pakistan

The Government of Pakistan has evolved policy frameworks backed by strategy to address various aspects of the climate change including major policy and climate related interventions. In order to mitigate the negative impacts of automobile sector on environment and giving a boost to the economy, Government has approved its National Electric Vehicle Policy targeting a 30 percent shift to electric vehicles by 2030.

Pakistan will host World Environment Day 2021 in partnership with UN Environment on 5th June 2021. This year's observance of World Environment Day will be on the theme of 'ecosystem restoration' and will focus on resetting our relationship with nature. This event will also mark the formal launch of the UN Decade on Ecosystem Restoration 2021 – 2030. This aims to prevent, halt and reverse the degradation of ecosystems on every continent and in every ocean. The Government has taken different initiatives to mitigate the effects of environment and climate.

**Major Initiatives in Forestry Sector**

Pakistan is forest deficient country, mainly due to arid and semi-arid climate in large parts of the country. The country is maintaining 4.51 million hectares to 5.01percent area under forest cover, out of which 3.44 million hectares forests exist on state-owned lands and remaining on communal and private lands. Though the forestry having meager share of 2.1 percent in agriculture, it provides foundations of life on earth through ecological function, regulates the climate and water resources and serves as habitat for plants and animals[1].

Rapidly growing population coupled with poverty and lack of awareness is leading to illegal and unsustainable logging and overharvesting of wood for fuel and charcoal continue to cause deforestation. Moreover, forest fires, natural hazards along with pests and diseases further contribute to the declining rate.

All these issues threaten the survival of species, people's livelihoods and undermines the vital services that forests provide. To meet the domestic needs and to maintain the existing forest stand together with meeting need of improving the forest cover. The government has taken different measures for the revival of forestry sector, the detail is as follows:

**I. Ten Billion Tree Tsunami Programme (TBTTP)**

The TBTTP is built on successful initiative of Khyber Pakhtunkhwa's Billion Trees

[1] Compendium on Environment Statistics of Pakistan (PBS)

Afforestation Project (BTAP). Following the success and confirmation by the independent monitors, the government has decided to set a goal of "10 Billion Tree Plantation" across the country. The programme was approved by ECNEC with the project cost of Rs. 125.184 billion. During Phase-I of the programme, plantation / regeneration of 3.29 billion plants will be completed. The programme has achieved plantation of about 350 million during July-March FY2021 and cumulatively has attained 814.671 million plants through regeneration. Through this programme around 100,000 daily wagers have been employed uptill March 2021. The Government is confident that a target to plant one billion trees will be achieved by June 2021.

This project is expected to deliver environmental dividend in preserving atmospheric health, reducing greenhouse gas effects, lowering cases of random floods, lowering rains, droughts and enhancing other biodiversity supportive actions. It is anticipated that approximately 1.5 million jobs will be created directly or indirectly.

**Table 16.1: Physical & Financial Progress FY2020 & FY2021(July-March)**

| S. No | Provinces | Number of Trees (million) | Area (Hectare) | Budget Utilization (Rs-million) |
|---|---|---|---|---|
| 1. | Khyber Pakhtunkhwa | 304.24 | 340,068 | 5,509.14 |
| 2. | Punjab | 61.5 | 20,806 | 5,216.04 |
| 3. | Sindh | 323.84 | 19,500 | 1,290.64 |
| 4. | Balochistan | 5.42 | 2,435 | 658.979 |
| 5. | Azad Jammu & Kashmir | 106.937 | 40,512 | 1,536.266 |
| 6. | Gilgit Baltistan | 10.734 | 1713 | 4,59.589 |
| Total | | **814.671** | **125,034** | **14,670.654** |

Source: Ministry of Climate Change

## II. Protected Areas Initiative

The overall objective of 'Ten Billion Tree Tsunami Programme' is to revive Forest and Wildlife resources in Pakistan, to improve the overall conservation of the existing Protected Areas; encourage eco-tourism, community engagement and job creation through the conservation. To meet challenges faced, to protect and preserve wildlife, TBTTP is aiming at better management of 23 protected areas. The initiative will increase venues for international standards of Eco-tourism and is aiming to provide about 5,500 green jobs. The total cost of this initiative shall be Rs. 3.89 billion and it will include community engagement as follows:

- Seven "Autonomous Protected Areas Management Boards" will be developed to provide strategic direction to guide, direct and monitor the activities of executing parties.
- Under the Protected Area Initiative 66 communities will be engaged which will create job opportunities for them.

- Sixty five Village Conservation Committees (VCCs) will be established within first year of implementation.
- Ten Village development plans will be designed after the VCCs are established within the first year, improving livelihood and financial conditions of the communities.
- During the first year of project, 805 community watchers for Protected areas will be hired accordingly

**Table 16.2: Protected Areas in Pakistan**

| Province | Name | Area (sq. km) |
|---|---|---|
| Islamabad Capital Territory | 1. Margalla Hills National Park | 173.9 |
| Punjab | 2. Kheri Murat National Park | 56.2 |
| | 3. Salt Range National Park | 52.6 |
| | 4. Rakh Choti Dalana | N.A |
| Gilgit-Baltistan | 5. Deosai National Park | 3622.1 |
| | 6. Khunjerab National Park | 44506.0 |
| | 7. Himalaya National Park | 2263.0 |
| | 8. Nanga Parbat National Park | 1785.6 |
| Sindh | 9. Takar National Park | 435.1 |
| | 10. Karunjar National Park | N.A |
| Balochistan | 11. Astola Marine Protected Area | 401.5 |
| | 12. Takatu State Forest Area | 38.9 |
| | 13. Hingol National Park | 6290.5 |
| | 14. Chiltan-Hazar ganji National Park | 278.0 |
| Azad Jammu & Kashmir | 15. Machiara National Park | 135.4 |
| | 16. Toli Pir National Park | 50.4 |
| | 17. Deva Vatala National Park | 14.5 |
| Khyber Pakhtunkhwa | 18. Lulusar-Dudipat Sar National Park | 303.6 |
| | 19. Saif-ul-Maluk National Park | 55.6 |
| | 20. Broghil National Park | 1347.6 |
| | 21. Chitral Gol National Park | 78.0 |
| | 22. Ayubia National Park | 33.7 |
| | 23. Sheikh Badin National Park | 155.4 |
| **Total Area** | | **62077.6** |

Source: Ministry of Climate Change

## III. Wildlife Management

The challenges for the protection and preservation of wildlife of Margallah Hills National Park (MHNP) could be managed through improvement and effective implementation of Islamabad Wildlife (Protection, Preservation, Conservation and Management) Ordinance 1979, legislation and institutional strengthening. The following measures have been taken for the wildlife management of Margallah Hills National Park:

- Enhanced management of Protected Areas i.e., Margallah Hills National Park by setting goals on international standards
- Revival of critically endangered spices and their Habitats
- Restriction of illegal wildlife trafficking and hunting in ICT
- Rehabilitation/ Rescue Center for Confiscated Wildlife in Islamabad

- Zero plastic in hiking trails and other areas of MHNP, "Plastic free National Park"
- Improvements of Islamabad Wildlife (Protection, Preservation, Conservation and Management) Ordinance 1979 legislation and its implementation
- Engage different universities students to conduct scientific studies in MHNP
- Awareness about the importance of wildlife in MHNP to students and general public

**Natural Capital Account**

Pakistan in a recent development is partnering with World Bank to explore and formulate Natural Capital Account of protected areas that can provide detailed statistics for better management of the economy. National Capital Account can be used to help identify the distributional consequences of changes to land use, forest cover and ecosystem function which will help the government to gauge whether planned economic growth is inclusive. The outcome will help the government to design the evidence-based national forest policy and plans. Improved institutional framework and strategies are needed for the achievement of SDGs and implementing the SDGs pertaining to climate change like SDG 15 (sustainable forest management), SDG 7 (Ensure access to affordable, reliable, sustainable and modern energy for all), SDG 12 (sustainable consumption and production), SDG 6 (protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes) and SDG 13 (climate change action).It requires a solid framework of indicators and statistical data for policymaking to monitor progress and ensure accountability. Natural Capital Accounting expands the scope of traditional reporting and can meet this need

**Participation in Reducing Emissions from Deforestation and Forest Degradation (REDD+)**

Reduced Emission from Deforestation and Forest Degradation (REDD+) is a concept adopted by the countries under United Nations Framework Convention on Climate Change (UNFCCC) in 2010. The concept relates to absorption of atmospheric carbon through forest resource. Due to accumulation of carbon in standing trees their financial value increases. Carbon stocked in forests is traded in carbon markets.

The REDD+ Readiness Preparation Proposal (R-PP) is being implemented in Pakistan with a grant of $ 3.8 million since July 2015. Pakistan was awarded the grant through a competitive process by Forest Carbon Partnership Facility (FCPF) of the World Bank. International and national consultants were hired to prepare documents for the four elements required to complete the REDD+ readiness phase. Meanwhile, in 2018, an additional grant of $ 4.01 million has also been awarded by FCPF to further support the preparedness activities in Pakistan till June 2020. The Forest Reference Emission Level (FREL) of Pakistan has been submitted to UNFCCC. The design of National Forest Monitoring System has also been finalized.

**Nationally Determined Contributions (NDC) Revision**

As per Paris Agreement, parties are obligated to submit revised NDC every five years with enhanced commitments. Government of Pakistan is in the process of revising its

NDCs for a more robust and ambitious NDCs covering all economic sectors. For the revised NDCs, Pakistan is aiming to highlight the projects which have been conducted with its indigenous resources in the last five years like institutional arrangements, governance approaches and also include new gases to GHG inventory and new sectors like Blue Carbon, Electric Vehicles, Health co-benefits, Air pollution and Youth etc. for enhanced commitments. The revised NDCs will be institutionalizing a 'whole-of-government' approach to revising, reviewing and reporting on climate action.

The enhancement activities like Updated Greenhouse Gas Inventory, mapping of Pakistan's vulnerabilities and options to strengthen resilience of most vulnerability to climate change, the selection and application of appropriate tools and methodologies for adaption and mitigation in priority sectors, developing Marginal Abatement Cost Curves (MACC) for the different NDC sectors which allows government to ratchet up climate ambition, conducting Gender and climate change nexus, Youth and climate change nexus, Health, Climate change and air pollution nexus and estimation of emission from refrigerant gases.

**National Greenhouse Gas Inventory**

The Government is committed to submit its first biennial update (BUR-I) to United Nations Convention on Climate Change (UNFCCC) and information on national GHGs inventory is as an essential component of the report. In this respect, national GHGs inventory is prepared using the standard techniques contained in the Inter-governmental Panel on Climate Change (IPCC), 2006, Guidelines for National Greenhouse Gas Inventories (using IPCC GHGI Software, version 2.69). This inventory provides information regarding GHGs namely $CO_2$, $CH_4$ and $N_2O$ emitted from the anthropogenic sources from all sectors of economy including energy, Industrial Product & Product Use (IPPU), agriculture, forestry and other land use and waste.

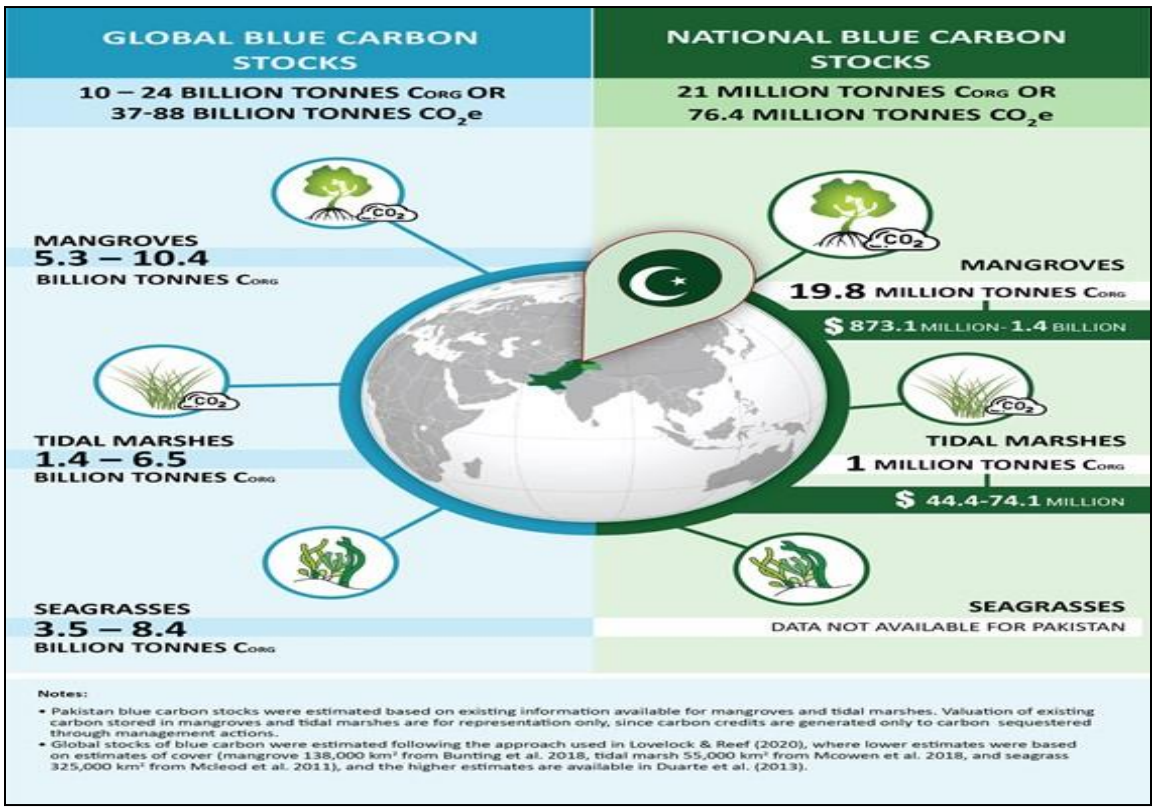
**Carbon Markets**

In line with commitment to the Paris Agreement under Article 6 facility Pakistan intends to establish a robust and cohesive carbon market. Carbon market can generate fiscal resources and green jobs to support sustainable recovery from economic regression in the medium term. To develop local "carbon trading" and participate in international carbon market; the MoCC has conducted a study on the Introduction of Carbon Pricing Instruments with support of UNFCCC. As a result of the study National Committee on the Establishment of Carbon Market (NCEC) was established after approval of Prime Minister. Further, NCEC is tasked to design domestic Emission Trading Scheme (ETS) framework, Monitoring, Reporting and Verification (MRV) infrastructure and procedures underpinned by communication strategy and capacity building and training of the relevant stakeholders.

**Blue Carbon**

Ministry of Climate Change with the support of the World Bank conducted Blue Carbon rapid assessment for Pakistan to figure out how and where to act to protect and bolster blue carbon opportunities. Accordingly, Pakistan envisions gaining value from blue carbon in a plethora of ways that can be beneficial for climate and ocean. The assessment

concluded that in total, mangrove forests and mapped tidal marshes store approximately 21 million tonnes of organic carbon (Corg)or 76.4 million tonnes $CO_2e$. It is estimated that the Sindh government's Indus Delta Mangroves REDD+ Project, which is being conducted on 350,000 ha, will remove 25 million CO2e by 2030 and 150 million by 2075. This project will result in removals equivalent to approximately 0.25-0.5 percent of Pakistan's annual emissions.




Source: Ministry of Climate Change

### Water, Sanitation and Hygiene (WASH) Programme

The government recognizes access to drinking water and sanitation services as a fundamental human right as enshrined in the Constitution of Pakistan under Article 9 that "no person shall be deprived of life or liberty save in accordance with law". The commitment of government for creating an enabling environment for water and sanitation has been reinforced through launching of Clean Green Pakistan Movement (CGPM) by the Prime Minister in October 2018, showing the highest level of commitment to the subject. Ministry of Climate Change is developing a national WASH programme, in collaboration with the provinces, as COVID-19 response strategy with a key focus on liquid waste management and effective municipal service delivery.

### Sector Financing for Water Sanitation and Hygiene:

Pakistan spent around 0.22 percent of its GDP on water and sanitation in 2019 as compared to 0.16 percent of its GDP in 2012-13. Pakistan needs Rs 450 billion annually, based on SDGs costing tool of World Bank/UNICEF, to meet SDG targets of WASH by

2030. The overall budget allocation in FY2020 was Rs 158 billion annually for WASH. The spending was Rs 87 billion annually through public sector with overall utilization of only 55 percent of budgetary allocations.

At federal level, Ministry of Climate Change (MoCC) has been entrusted the role of policy formulation, standards settings, reporting and coordination for regional and international commitments. The WASH Strategic Unit at the MoCC rolled out Joint Sector Reviews (JSRs) of WASH by arranging a training workshop of key provincial departments and sector partners. The capacity development on key technical areas is being included in new national WASH programme of the MoCC. The detail of budget allocation and expenditure for FY2020 is given table 16.3 below:

**Table 16.3: Budgetary Allocations and Expenditures for WASH FY2020**

| Province/ Region | Allocations – Rs Million | | | Spending – Rs Million | | |
|---|---|---|---|---|---|---|
| | Current | Development | Total | Current | Development | Total |
| Balochistan | 5,970 | 16,553 | 22,523 | 6,068 | 6,532 | 12,601 |
| Khyber Pakhtunkhwa | 8,288 | 19,913 | 28,201 | 10,549 | 7,021 | 17,570 |
| Punjab | 10,071 | 31,334 | 41,405 | 10,162 | 17,477 | 27,639 |
| Sindh | 8,849 | 47,450 | 56,300 | 5,455 | 15,477 | 20,932 |
| Federal | 470 | 9,579 | 10,049 | 470 | 7,573 | 8,043 |
| **Total** | **33,648** | **124,829** | **158,477** | **32,705** | **54,080** | **86,785** |

Source: Ministry of Climate Change

For 2021, the Federal and Provincial Governments allocated Rs 150 billion in the country in spite of the challenge of resource constraints due to Covid-19. This is the highest in Balochistan province with Rs 2,815 per capita followed by Federal and Khyber Pakhtunkhwa province. The per capita allocation has been the lowest in the Punjab province. The province/region wise allocation and per capita allocation has been given in table 16.4 below:

**Table 16.4: Allocation for WASH FY2021**

| Province/ Region | Current – Rs Million | Development – Rs Million | Total Rs Million | Per capita - Rs |
|---|---|---|---|---|
| Balochistan | 6,210 | 28,418 | 34,627 | 2,815 |
| Khyber Pakhtunkhwa | 8,686 | 25,302 | 33,988 | 1,082 |
| Punjab | 6,289 | 31,359 | 37,649 | 338 |
| Sindh | 8,345 | 25,108 | 33,453 | 684 |
| Federal | 431 | 10,100 | 10,531 | 1,210 |

Source: Ministry of Climate Change

## Pakistan Climate Resilient Urban Policy Framework

Climate change is a real threat to the sustainability of our cities. MoCC is formulating Pakistan Climate Resilient Urban Policy Framework, which will take into account

opportunities and challenges in achieving green and resilient urban development in Pakistan with special reference to climate change.

PSDP Project "Climate Resilient Urban Human Settlements"(CRUHS) Unit to address the urban environmental and climatic issues in a sustainable and resilient way is also under execution. The CRUHS Unit will serve for 05 years as the Secretariat to follow-up and arrange the conduction of various research studies on developing the Climate Resilient Sustainable Cities. The Ministry of Climate Change will be equipped to effectively look after at national level the subject of urban affairs & human settlements and efficiently deal with all related matters in coordination with the sectoral partners, including the provincial governments and local authorities; private sector and multilateral and bilateral agencies.

**Gender Dimension in Climate Action**

In recent years, the gendered nature of climate change impacts has been recognized by researchers and development practitioners. In view of this, MoCC has begun to address this climate change-gender nexus. A working group has been established on gender and climate change and they are working on mainstreaming gender in to existing and future policies, plans and initiatives which will address different sectors vulnerable to climate change like water, agriculture, fishery etc. Additionally, an initiative is also underway with International Union for Conservation of Nature (IUCN) where country capacity will be strengthened to implement gender responsive climate change program and a national Climate Change Gender Action Plan CCGAP will be finalized.

**Youth and Climate Change Perception Survey**

Pakistan is the fifth most populous and one of the youngest countries in the world. Almost 27 percent of the Pakistani population is between 15 to 29 years. The number of youth in Pakistan are expected to peak till 2050. Youth remains the biggest stakeholder in climate action due to the intergenerational nature of climate challenges and, hence as such deserve to be at the forefront of all planned policies and action. Towards that end, the MoCC, in collaboration with UNDP conducted a youth survey aimed at gauging the perception and knowledge of Pakistan's youth regarding climate change. The survey aimed to collect information on a host of subject areas that were divided into five themes such as Climate Change knowledge, Climate Change vulnerability, Adaptation strategies, Regulatory knowledge and Climate advocacy.

The results indicate the highly prevalent impact of climate change on Pakistan. Marked differences in understanding of climate change were observed in cohorts that belonged to rural or urban areas. Majority (70 percent) of the phone respondents reported limited to no knowledge of the concept of environmental sustainability, whereas over 60 percent of the digital respondents claimed to have high or very high understanding of the concept of climate change, highlighting a major gap in climate change awareness within digitally challenged youth of Pakistan. The government initiatives launched in order to promote the green economy or to provide financial support against those who

had suffered due to climate change were well acknowledged as agents of change with 84 percent of the respondents crediting increased knowledge through these ventures and programs.

### Clean Green Pakistan Index and Champions Programme

In Clean Green Pakistan Movement (CGPM), the MoCC started Clean Green Pakistan Index for ranking the cities against the performance of five pillars of Clean Green Pakistan i.e., drinking water, sanitation, hygiene, solid waste management and plantation. The Index is calculated by comparing the cities with 35 performance indicators. The pilot has been successfully implemented in 20 cities of Pakistan during 2020 in Khyber Pakhtunkhwa and Punjab and was concluded in October 2020. It is now being scaled up in 93 cities of Pakistan across the country from 2021. The CGPI is becoming a key tool for integrating mutual accountability mechanisms of WASH in Pakistan. Ranking of cities in Punjab and Khyber Pakhtunkhwa is given in fig-16.1 and fig-16.2 below:

**Fig- 16.1: Cities' Ranking - Punjab**

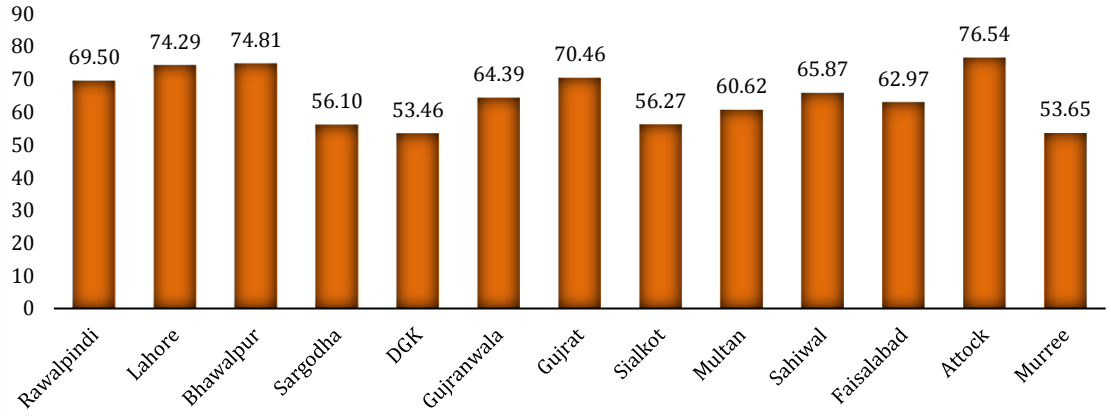
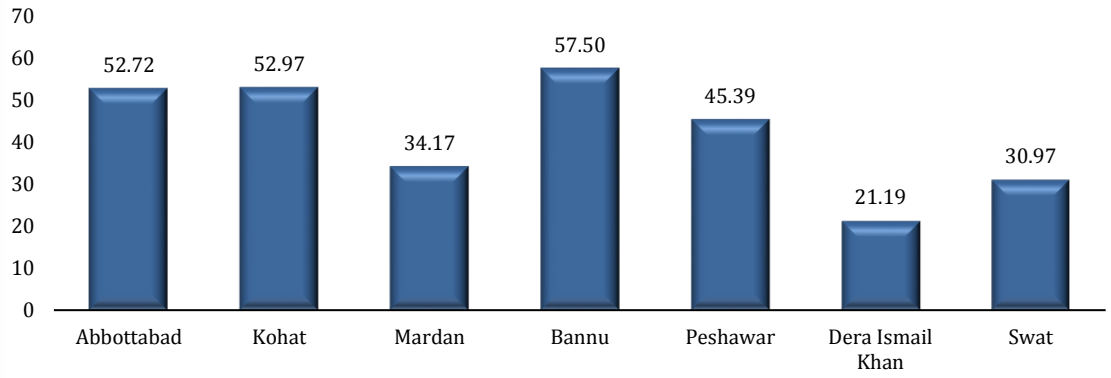



**Fig- 16.2: Cities' Ranking - Khyber Pakhtunkhwa**




Source: Ministry of Climate Chage

## National Adaptation Plan (NAP)

Pakistan has officially initiated the process of creating a National Adaptation Plan (NAP) for building resilience to climate change. NAP is widely seen as one of the most important mechanisms for adapting to climate change. They aim to reduce vulnerabilities to climate impacts by creating comprehensive medium and long-term plans, including the integration of adaptation measures into national policy. Pakistan will be using the National Adaptation Plan process and its outcomes to enhance the adaptation elements of the Nationally Determined Contributions (NDCs), a central aspect of the Paris Agreement. Pakistan has been using nature-based solutions and 'ecosystem-based adaptation' in its national efforts to build climate resilience. The National Adaptation Plan process will be looking to build on these existing nature-based approaches which include the Ten Billion Trees Tsunami Programme, the Ecosystem Restoration Fund and the Recharge Pakistan initiative.

## Coordination with International Environmental Agencies on Environmental Issues

MoCC is responsible for coordination with international environmental agencies on environmental issues, signing & implementation of MOUs and handling of matters related to GSP+. Moreover, it also represents Pakistan at international fora with respect to the signed Conventions and Protocols. The major achievements during 2020-21 are as under:

- Ratification of Minamata Convention on Mercury and Organizing Awareness Seminars for Compliance of Minamata Convention.
- UNEP approved funds for the project titled "Strengthening of National Legislation and Capacity Building of Stakeholders for Sound Chemicals and Hazardous Waste Management in Pakistan".
- A project titled "Development of National Inventory of Plastic Waste in Pakistan" has been submitted to Basel Convention Regional Centre, Tehran for funding under Small Grant Programme (SGP) on plastic waste.
- Completed a project titled "Comprehensive Elimination and Destruction of Persistent Organic Pollutants (POPs) in Pakistan".

## National Ozone Unit (NOU)

The National Ozone Unit remained actively involved in multiple activities to attain targets relating to containing Ozone Depleting materials. The Unit has successfully distributed Hydro Chloro Fluoro Carbon (HCFC) quota for 2021 among 21 eligible importers on 50 percent compliance target from baseline of 248.11 Ozone Depletion Potential (ODP) tons under Montreal Protocol. The Unit held pre consultative workshop for draft proposal of Hydrofluorocarbons Phase Out Management Plan (HPMP)-III for which all the stakeholders including Industries, Imports and government departments

have been taken on board. This has enabled NOU to make an overarching strategy for the HPMP stage III. The draft has been prepared which focuses on the HCFC phasing out while promoting ozone-friendly, climate-friendly and energy-efficient technologies to the possible extent. The proposed strategy also includes the establishment of a Recovery, Recycling and Reclaims (RR&R) center as well as raising awareness of stakeholders on the Kigali Amendment and its future obligation phase-down.

### Environmental Protection

MoCC is mandated to enforce the Pakistan Environmental Protection Act, 1997 in the Islamabad Capital Territory. The following major activities are being undertaken by Pak-EPA:

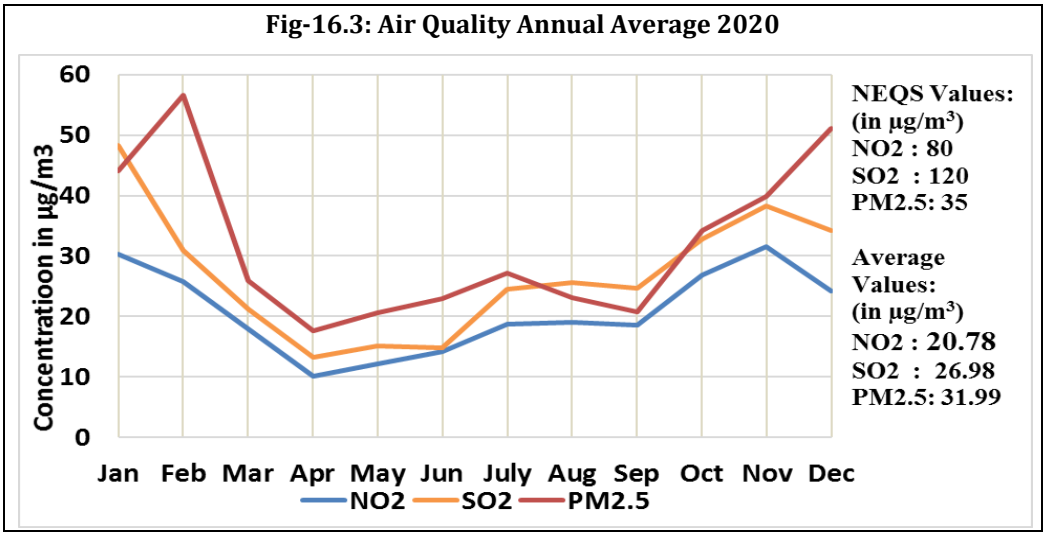
### Water Quality

An Integrated Surveillance System to monitor the Islamabad's natural streams and river water samples is established and samples were collected and analysed, from nalah, Margallah hills and sewerage system of ICT. Teams collected eight water samples from Wah Garden and 25 water samples from CDA filtration plants, industrial and slaughter waste/effluent water. Five bore water samples were collected from (Barakahu). Lab/NEQS directorate July 2020 to March 2021 collected fifty-two (52) water samples and tested in EPA laboratory. Ten environmental industries/sites were visited to check Environmental Management Plan status.

### Air Quality

Pak-EPA has established an active and reliable monitoring system to routinely monitor air emissions of steel, pharma, aluminium, food industries, brick kilns and construction sites. Fixed monitoring station located in H-8, Islamabad. Data is gathered and analyzed on 24-hourly basis and disseminated to the public through Pak-EPA website (wwww.environment.gov.pk) and official social media accounts.

**Fig-16.3: Air Quality Annual Average 2020**



**Legal /enforcement directorate has taken following actions during 2020-21**

- One hundred sixty six notices served upon the violators for causing Environmental Pollution in Islamabad including Brick Kilns, Hospitals, Industries of all users of Polythene Bags.
- Pak-EPA issued Forty seven Environmental Protection Orders on violation of Environmental Laws/Rules/Regulations including Brick Kilns, Project Proponents of different Housing Societies, Hospitals, Steel Industries, Polluters, Violators of Plastic Shopping Bags Regulations.
- Environmental Monitoring and Implementation Teams confiscated a volume of 700 kilograms Polythene Bags from different outlets/selling points in ICT.
- Due to non-compliance of National Environmental Quality Standards eight Brick Kilns were sealed.

**Ban on Polythene Plastic Bags in Islamabad Capital Territory**

In order to curb plastic pollution, Pakistan Environmental Protection Agency with the support of Ministry of Climate Change imposed a ban on polythene plastic bags in ICT vide SRO. No.92 (KE)/219, dated 22nd July, 2019 that imposed a complete ban on polythene bags (Manufacture, import, storage and Usage) in ICT which also includes fines on manufacturers, shopkeepers and users Rs. 100,000, Rs 10,000 and Rs 5000, respectively.

- Launched integration of Mobile App on "Ban on Polythene Bags" into City Islamabad application.
- MoCC organized First National Dialogue and Stakeholder Convening with the Collect and Recycle (Core) Alliance on topic "Collective action approach to deal with packaging waste"at Islamabad.
- Conducted a detailed survey on waste to help in policy building.
- MoCC in collaboration with European Union Switch Asia is preparing the waste reduction and minimization of plastic waste management. In addition to this, Ministry is working on expanded producer responsibility tools to facilitate effective plastic waste management and build capacity of relevant stakeholders across the country (both federal & provincial level).

**Global Change Impact Studies**

The Global Change Impact Studies Centre (GCISC) is corporate body, governed by an independent Board of Governors, with the mandate of conducting research on climate change and its impacts and possible remedies. Specific research themes include the climate change profiles of Pakistan, impacts on critical socio-economic sectors and identification of appropriate adaptation/mitigation strategies.

## Green Climate Fund (GCF) Projects under the Ministry of Climate Change

GCF was established to limit greenhouse gas emissions in developing countries and to help vulnerable societies adapt to the unavoidable impacts of climate change. The ongoing projects under GCF are as under:

### 1. Scaling-up of Glacial Lake Outburst Flood (GLOF II) Risk Reduction in Northern Pakistan

MoCC has initiated US$ 37 million project with UNDP funded by GCF. The project objective is to reduce the vulnerability of the communities in Northern Pakistan to climate change-induced natural disaster risks as a result of GLOFs. Currently the project targets 18 districts (10 in Gilgit Baltistan & 8 in Khyber Pakhtunkhwa). In target communities, 95 percent of households able to receive and respond to early warnings and take the appropriate action, At least 250 small-scale engineering structures established to reduce the effects of GLOF events on livelihoods, such as tree plantation, controlled drainage and mini dams, 50 weather monitoring stations to collect meteorological data in catchment areas; 408 river discharge sensors to collect river flood data. This data will inform hydrological modelling and help develop village hazard watch groups and to improve food security and reduce flood risks due to deforestation and inefficient water use, 65,000 women will be trained in home gardening, 240 water-efficient farming technologies will be installed and 35,000 hectares of land will be reforested.

### 2. Transforming the Indus Basin with Climate Resilient Agriculture and Climate-Smart Water Management

GCF signed this project with FAO and granted $ 35 million. The project objective is to transform agriculture in the Basin by increasing resilience among the most vulnerable farmers and strengthening Government's capacity to support their communities to adapt. It will build farmers resilience to climate change through skills, knowledge and technology and create a wider enabling environment for continuous adaptation and expanded sustainable uptake of climate-resilient approaches. The project will be implemented in eight districts in Punjab and Sindh Provinces over a six-year period at a total cost of $ 47.69 million with a co-financing from both the provinces.

## Global Environment Facility (GEF)

The Global Environment Facility (GEF) was established to tackle the environmental problems. The Ministry of Climate Change has currently a portfolio of $ 19.4 million with four projects under implementation.

1. Sustainable Forest Management to Secure Multiple Benefits in High Conservation Value Forests. ($ 9.3 million) UNDP
2. Generating Global Environmental benefits from Improved Decision-Making Systems and Local Planning in Pakistan. ($1 million) UNDP
3. Pakistan Snow Leopard Eco-System Protection Program. ($4.6 million) UNDP

4. Reversing Deforestation and Degradation in High Conservation Value Chilgoza Pine Forests. ($ 4.5 M) FAO

**Conclusion**

Pakistan has been consistently ranked as one of the most affected countries by climate change. The population is facing challenges of natural hazard like floods, droughts and cyclones, which have been growing in intensity and frequency with the passage of time. The government is taking different measures to effectively tackle climate change challenges, such as improving technological responses by setting in place early warning systems and information systems to enhance disaster preparedness climate change resilience and by improving forest management and biodiversity conservation. The government has launched TBTTP for the revival of Forest and Wildlife resources in Pakistan. Through this programme the government will improve the overall conservation of the existing Protected Areas, encourage eco-tourism, community engagement and will create jobs through the conservation.