



Government of Pakistan

Ministry of Climate Change & Environmental Coordination



Year Book

(2024-25)



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Co-Ord/Coord/Coor
2026, 10

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MESSAGE



Climate change remains one of the most pressing challenges of our time, posing significant risks to ecosystems, economies, and human well-being. Over the past year, the Ministry of Climate Change & Environmental Coordination has intensified its efforts to address the escalating impacts of rising temperatures, shifting weather patterns, and increasing frequency of extreme climate events across the country. These challenges demand a cohesive, coordinated and comprehensive plans, initiatives and actions which fall under the domain of the Ministry of Climate Change and Environmental Coordination.

The Ministry of Climate Change and Environmental Coordination is committed to the government's promise of building climate resilient environment and a sustainable future through formulation and implementation of prudent environmental policies. The Ministry aims to achieve better implementation of environmental policies through effective communication, structured coordination and mutual cooperation.

The year book 2024-25 presents a view of structures, plans, policies, progress and accomplishments of the Ministry, its attached departments, and autonomous organizations throughout the year 2024-25. The activities and achievements reflect contribution and commitment of the Ministry and other entities working under the Ministry to meet challenges of the climate change. I extend my sincere appreciation to my colleagues on their contributions but I must also say that a lot more is required to be done to ensure a green, sustainable and prosperous future.

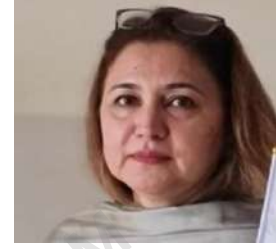
I hope you find the information presented in the year book valuable. We welcome your invaluable feedback and suggestions for further improvement.

(Musadik Masood Malik)
Federal Minister
Ministry of Climate Change
& Environmental Coordination





FOREWORD



The Year Book 2024-25 of the Ministry of Climate Change & Environmental Coordination (MoCC&EC) offers a comprehensive overview of our continued efforts towards building a climate-resilient Pakistan. Impacts of rapid climate change pose the biggest challenge of present-day world. Pakistan is particularly facing effects of climate change severely in the form of flood, heat waves, air pollution and water deficiency. These challenges underscore the urgent need for coordinated actions and sustainable development policies that address both the current and future risks posed by climate crisis.

This year, our Ministry has strengthened its focus on formulating and implementing policies that align with Pakistan's Nationally Determined Contributions (NDCs) under the Paris Agreement. We have continued to advance our work in areas such as climate adaptation, renewable energy promotion, sustainable urban development, forest management, and biodiversity conservation. Our aim remains to ensure that Pakistan is well-prepared to mitigate and adapt to the impacts of climate change while fostering economic growth and improving the quality of life for all citizens.

The Year Book highlights our key achievements, initiatives, and strategic plans. It outlines the work of the Ministry's various wings, details the contributions of our attached departments and autonomous bodies. Each section reflects our commitment to achieve sustainable development goals and our commitment for promoting a greener and, more resilient Pakistan.

I extend my sincere appreciation to the dedicated professionals, partners, and stakeholders who have worked tirelessly to help us achieve our objectives this year. As we continue on this path, I am confident that, with the support of our government, international partners, and civil society, we can make meaningful progress towards a sustainable and climate-resilient future for Pakistan.

We invite you to explore this Year Book to gain deeper insights into our efforts, accomplishments, and aspirations. Let us work together to create a more sustainable, prosperous, and resilient Pakistan.

(Aisha Humera Moriani)
Secretary
Ministry of Climate Change
& Environmental Coordination



1. FUNCTIONS OF THE MINISTRY (UNDER RULES OF BUSINESS, 1973)

Under the Rules of Business, 1973, the Ministry of Climate Change and Environmental Coordination (MoCC & EC) is assigned the following functions:

- National policy, plans, strategies and programs with regard to disaster management including environmental protection, preservation, pollution, ecology, forestry, wildlife, biodiversity, climate change, and desertification
- Coordination, monitoring and implementation of environmental agreements with other countries, international agencies, and forums
- Policy formulation, coordination and reporting of human settlements including urban water supply, sewerage, and drainage
- Pakistan Climate Change Council
- Pakistan Environmental Protection Agency
- Global Environmental Impact Study Centre, Islamabad
- Islamabad Wildlife Management Board
- Zoological Survey of Pakistan



2. ORGANIZATIONAL SETUP

The Ministry of Climate Change & Environmental Coordination has structured its functions across the following Wings to facilitate seamless execution of its policies and initiatives:

Administration & Development Wing

Environment and Climate Change Wing

Forestry Wing

International Cooperation Wing

Climate Finance Wing

2.1. Administration and Development Wing

The Administration Wing of the Ministry of Climate Change & Environmental Coordination (MoCC&EC) ensures efficient management of human resources, finances, and institutional governance to support climate-resilient development.

Led by the Joint Secretary (Administration & Development) and supported by Deputy Secretaries for Administration, Budget & Coordination, and Development, the wing oversees the Ministry's operations, including a workforce of 197 employees (56 officers and 141 staff members) in 2024-25. It plays a vital role in integrating climate policies into key sectors while ensuring smooth administrative and financial operations to advance the Ministry's environmental objectives:

Administration Section

Department & Organizations Section

Law Section

General Section

Council and Coordination Section

Development Section

F&A Section

Budget and Cash Section

Media Section

Responsibilities:

Responsible for the Ministry's administrative operations, the Administration Wing plays a crucial role in maintaining efficiency and coordination. Its core duties include:

- Personnel Administration of the officers/officials of the Ministry
- Personnel administration of officers of the attached departments/organizations
- Coordination between wings/attached departments/organizations of this Ministry and other Ministries/Divisions
- Matters relating to hiring of residential accommodation of officers/officials
- Re-imburement of medical charges to the serving/retired officers/officials
- Maintenance of Performance Evaluation Reports (PERs) record of all employees, and maintenance of annual declaration of assets held by the officers/officials of this Ministry
- Processing promotion, pay and pension cases of the officers/officials of the Ministry
- Nominations of officers/officials for the foreign and local trainings
- Preparation of Budgets, Technical Supplementary Grants (TSG) and re-appropriation of funds of the main Ministry and its attached departments/autonomous organizations
- Preparation of pay bills, contingent bills advance bills etc. on daily basis
- Preparation of pension bills
- Appropriation of Accounts Reconciliation of Expenditure of each month with AGPR
- Contribution to International Agencies, Internal Audit/External Audit
- Procurement of Stationery/Petty Items through Tender
- Repair/Maintenance of official vehicles of the Ministry
- Media Coverage of Minister, MOS and different wings of the Ministry, publication of advertisements relating to MoCC/Attached Departments/Development Projects etc.
- Social Media Coverage/uploads of Ministry, attached departments/organizations and Development Projects on Social Media, i.e. Facebook, Twitter and Instagram, in coordination with Prime Minister's Office
- Arranging the Press Conferences of the Federal Minister, Media Coverage of Seminars/Capacity building events in coordination with Press Information Department (PID)
- Legal matters/cases of Climate Change Division/Attached Departments, including service matters pending in different Courts/ Federal Service Tribunal (FST)

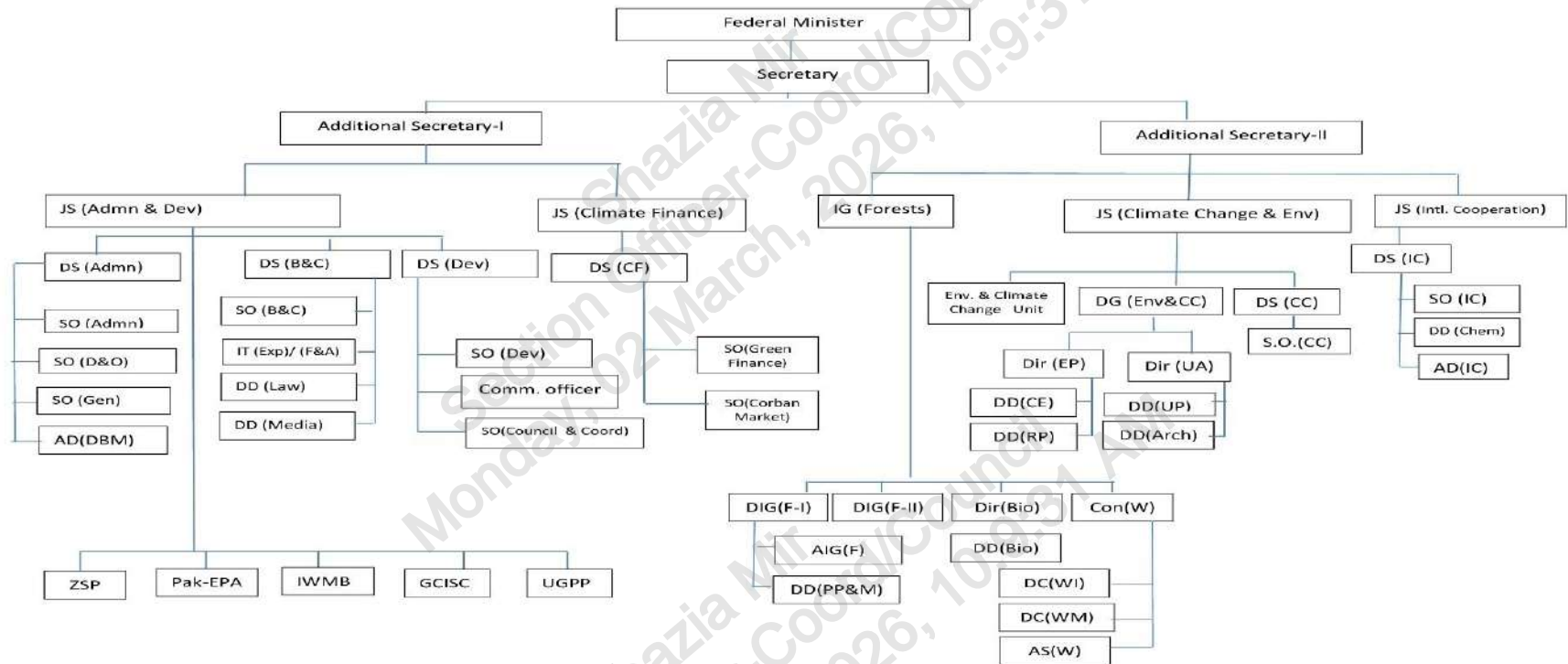
Achievements:

The achievements of the Administration Wing of the Ministry are outlined below:

- 100% implementation of the E-Office application in the Ministry, in collaboration with the Ministry of Information and Technology (MoIT), to enhance digital governance and operational efficiency.
- Networking infrastructure has been deployed and all wings of the Ministry and attached Departments & Organizations are using E-Office in order to bring efficiency, effectiveness and transparency.
- Recruitment of Inspector General Forest (BS-21) and Assistant Secretary (Wildlife) through FPSC in forest wing of this Ministry.
- Key Performance Indicators (KPIs) have been developed for all officers of the Ministry and attached departments and organization.
- Several officers were nominated, for local and international training programs, conferences, seminars, and study visits to strengthen their expertise in climate change.
- Appointment of three (03) members to PCCA, Executive Director, GCISC, constitution of new Board of Governors (BoG), GCISC and reconstitution of the Islamabad Wildlife Management Board to strengthen climate governance.
- Effected promotions of four (04) officers of Pak-EPA, two (02) officers of IWMB, and internal promotions within ZSP.
- Facilitated timely completion of nationwide survey of wild bird species across Sindh and other regions by ZSP.

Shazia Mir
Section Officer-Coord/Council
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ORGANOGRAM OF THE MINISTRY OF CLIMATE CHANGE & ENVIRONMENTAL COORDINATION



The Ministry is dealing with the following PSDP projects in FY 2024-25:-

STRENGTHENING TECHNICAL CAPACITIES OF MINISTRY OF CLIMATE CHANGE AND ENVIRONMENTAL COORDINATION

Introduction

Strengthening Technical Capacities of Ministry of Climate Change & Environmental Coordination (STC-MoCC&EC) is a special initiative of Ministry of Climate Change & Environmental Coordination (MoCC&EC), Government of Pakistan. Addressing climate vulnerability and ensuring environmental sustainability of Pakistan is the mandate of Ministry of Climate Change & Environmental Coordination (MoCC&EC), Government of Pakistan. The premier institution has a lead role in development and enactment of environmental legislation, accessing climate finance from international agencies, and ensuring optimal delivery by its projects (PSDP/foreign funded). However, this task is huge that requires strengthening of the technical capacities of Ministry of Climate Change & Environmental Coordination (MoCC&EC) so that it can play an integral role in combating climate vulnerability of Pakistan. To ensure an effective response to climate change issues of Pakistan, technical capacities with respect to project management, climate financing, country reporting, and climate advocacy need to be focused. With this premise, the PC-1 (aiming to strengthen technical capacities of MoCC&EC) was prepared and being executed by MoCC&EC.

Role and Functions

This project (STC-MoCC&EC) aims to enhance technical capacities of MoCC&EC through establishment of four (4) technical units:

- I. Green Finance Unit (GFU)
- II. Project Support Unit (PSU)
- III. Environment and Climate Change Unit (ECCU)
- IV. Climate Communication Unit (CCU)

Goals and Targets

STC-MoCC&EC envisions strengthening Pakistan's response to address climate change through improved access to climate finance in line with the national policy priorities and as obligated under the international commitments. Accordingly, the project will build capacities of Ministry of Climate Change & Environmental Coordination (MoCC&EC) regarding transboundary environmental issues, environmental legislation, matters related to Multilateral Environmental Agreements (MEAs), Water & Sanitation and Sustainable Development. Moreover, the project aims to support the portfolio of MoCC&EC development projects through enhanced coordination, oversight, quality assurance, technical backstopping, and capacity building activities. Lastly, this project also intends to enhance capacities of Ministry's media cell - the 4th pillar of state - for climate advocacy and public sensitization on key climate change issues, thus to create change at grass-root level in Pakistan.

Activities

- I. Strengthen MoCC&EC & national relevant institutional structures in Pakistan for addressing climate change through improved access to climate finance.
- II. Support in streamlining Pakistan's climate change agenda with national development priorities and strengthen coordination at all levels.
- III. Facilitate MoCC&EC in exploring global climate finance opportunities and GEF/GCF portfolio related matters by focusing on project development through support of UN agencies, accreditation of national entities, and country readiness programs.
- IV. Support the portfolio of MoCC&EC development projects through enhanced coordination, oversight, quality assurance, technical backstopping, and capacity building activities.
- V. Summarize & report progress and update of projects against their approved annual work plans (AWPs) on regular basis for allowing the senior management of MoCC&EC to remove any bottlenecks, constraints, and risks for smooth implementation of projects through designing, developing, deploying, and updating an innovative and real time 'projects monitoring portal'.
- VI. Compile information, data & knowledge generated by the implementation of MoCC&EC development projects by establishing a reference 'digital library of MoCC&EC projects.
- VII. Enhance skills of officers and staff of MoCC&EC and its attached departments through training on project management, monitoring & evaluation (M&E), procurement (goods & services), HR, financial management, safeguards, team building, and other related project design & implementation topics.
- VIII. Assess economic impacts (NPV, B/C ratio, contribution to GDP, value addition, etc.) and social impacts (poverty reduction, job generation, gender benefits, etc.) of MoCC&EC projects interventions.
- IX. Facilitate implementation of National Climate Change Policy (2021) and its Framework for Implementation by initiating sectoral programmatic initiatives in priority areas of environment & climate change.
- X. Support in translation of science into policy, planning and development related to environment & climate change.
- XI. Build capacity of Ministry of Climate Change & Environmental Coordination (MoCC&EC) regarding trans-boundary environmental issues, environmental legislation, water & sanitation, and sustainable development.
- XII. Support MoCC&EC in preparation of country reporting against the Multilateral Environmental Agreements (MEAs).
- XIII. Build media capacity for improved reporting on climate change issues.
- XIV. Enhance linkages with relevant media entities to showcase work carried out by the Ministry of Climate Change & Environmental Coordination (MoCC&EC) on

climate change matters and thus disseminate the efforts of MoCC&EC at national and international level.

- XV. Sensitize public on key climate change issues, as well as taking climate mitigation and adaptation actions, through media and create change at grass-root level.

Achievements

- I. Initial recruitment process has been completed since August, 2024 with the hiring of following five technical personnel:
 - i. Carbon Market Specialist
 - ii. Policy Development Expert (Mitigation)
 - iii. Policy Development Expert (Adaptation)
 - iv. Monitoring and Evaluation Specialist
 - v. Admin and Finance Specialist
- II. Revolving Fund Account/ Foreign Aid Assignment Account has been opened at the National Bank of Pakistan to avail foreign funding.
- III. Three (3) out of the Four (4) technical units have been operational since August, 2024 in order to enhance technical capacities of respective wings of MoCC&EC.
- IV. Monitoring and Evaluation Framework and M&E Plan have been prepared and approved. M&E exercise has been completed for two (2) PSDP projects.
- V. Database to record local and foreign trainings of MoCC&EC personnel has been developed.
- VI. PC-I on Green Skills has been prepared and approved.
- VII. Development of Concept Note and PC-I on Biodiversity Beyond National Jurisdiction.
- VIII. Moreover, STC technical personnel supported the relevant wings of the Ministry in:
 - i. Development of climate finance strategy
 - ii. Analysis of Pakistan Green Taxonomy Framework
 - iii. Preparations for COP-29
 - iv. Engagement in the Global Shield Initiative.

PAKISTAN BIOSAFETY CLEARING HOUSE FOR GMOS REGULATIONS

INTRODUCTION

Pakistan is a signatory to various Multilateral Environmental Agreements (MEAs)/conventions/protocols and has ratified all of them. Among these MEAs, the Cartagena Protocol on Biosafety (CPB) is a part of the Convention on Biological Diversity (CBD) that provides guidelines to regulate the handling, packaging, and transboundary movement of Genetically Modified Organisms (GMOs)/Living Modified Organisms (LMOs). Pakistan has been a party to the CPB since May 31, 2009, and has committed to fulfil all its obligations.

Pakistan has also been a beneficiary of GSP+ (Generalized Scheme of Preferences Plus) since January 2014. The GSP+ status granted by the European Union (EU) offers developing countries duty-free access to the EU market for a wide range of products. This preferential status is tied to strict conditions, including the implementation of 27 international conventions related to human rights, labor rights, environmental protection, and good governance. Under GSP+ requirements, Pakistan is obligated to adhere to conventions that address biosafety, which include:

1. **Cartagena Protocol on Biosafety (CPB):** This international agreement, under the Convention on Biological Diversity (CBD), focuses on the safe handling, transport, and use of genetically modified organisms to prevent adverse effects on biodiversity and human health.
2. **Convention on Biological Diversity (CBD):** Emphasizes the sustainable use of biodiversity and the regulation of modern biotechnologies like GMOs.

Therefore, to fulfil the obligations of CPB to ensure the biosafety of human health and the environment in Pakistan, the Pakistan Biosafety Clearing House (Pak-BCH) project was initiated by the Pakistan Environmental Protection Agency (Pak-EPA) in 2024 under the Pakistan Environmental Protection Agency Islamabad, under the Ministry of Climate Change and Environmental Coordination (MoCC&EC), Islamabad to regulate the GMOs in Pakistan.

Pak-BCH team, including the technical and operational members is playing a vital role in regulating GMOs/LMOs in the country and effectively manages application review, licensing mechanisms, and post-licensing monitoring of genetic manipulation work, field trials, commercialization, and import of GMOs for Food, Feed, and Processing (FFP) in compliance with CBD and the Pakistan Regulatory Mechanism for GMOs.

ROLES AND FUNCTIONS

The functions of the Pak-BCH are given below:

- i. To establish a Biosafety Clearing House (BCH) to implement the Cartagena Protocol under the Convention on Biological Diversity (CBD).
- ii. To regulate GMO-related activities and develop necessary procedures for GMO risk management and labeling.
- iii. To ensure enforcement of Pakistan Biosafety Rules, 2005 (amended 2024) & National Biosafety Guidelines (amended 2024).
- iv. To regulate the import/export, production, storage, handling, sale, or release the GMOs.
- v. Implementation of obligations under the Cartagena Protocol on Biosafety.
- vi. Capacity Building and Awareness.
- vii. National and International Reporting.
- viii. Dissemination of information to the public, academics, researchers, scientists etc.
- ix. Facilitate the exchange of scientific, technical, environmental, and legal information and experience regarding GMOs.
- x. Capacity building and training of national stakeholders.
- xi. GM crop field trials monitoring and reporting.
- xii. Facilitate public awareness and education.

GOALS AND TARGETS

Short-Term Plans:

1. Establishment of the BCH Portal:

The primary goal is to create a fully functional Biosafety Clearing House (BCH) portal. This portal will serve as a national platform for the dissemination of information regarding genetically modified organisms (GMOs) and the implementation of Pakistan Biosafety Rules, 2005 (amended 2024). It will facilitate the researchers, regulators, and the public to access shared information, submit applications, and review decisions on GMOs. The portal will also connect with the global BCH system under the Cartagena Protocol on Biosafety, ensuring that Pakistan meets its international obligations in biosafety information exchange.

2. Online Application Submission and Evaluation:

To streamline the regulatory process, an online system will be developed for the submission, processing, and evaluation of applications related to GMOs. This system will improve efficiency by replacing manual submission methods, ensuring timely submission and review by the Technical Advisory Committee (TAC) followed by approval of National Biosafety

Committee (NBC). The online system will not only facilitate researchers and organizations but will also allow the tracking of application status, ensuring transparency and accountability in decision-making regarding GMOs.

3. Registration of Institutional Biosafety Committees (IBCs):

A registration system for Institutional Biosafety Committees (IBCs) will be established to monitor and regulate GMO research at the institutional level. This will ensure that all institutions conducting GMO-related work in Pakistan adhere to the National Biosafety Guidelines, 2005 (amended 2024). By creating a network of registered IBCs, BCH will be able to track and oversee GMO research and development activities more effectively, thereby safeguarding environmental and public health. The registration system will serve as a critical regulatory checkpoint in the overall governance of GMOs in the country.

4. Monitoring of GMOs related activities:

Pak-BCH team will coordinate with public and private sector research organizations that are involved in biotechnology/GMO-related research activities and will monitor the genetic manipulation lab work, field trials, commercialization, and import of GMOs in Pakistan.

Long-Term Plans:

1. Establishment of National Biosafety Centre

Pak-BCH project may be regularized as a National Biosafety Centre to ensure the effective implementation of the Cartagena Protocol and Pakistan's Biosafety Regulations for genetically modified organisms (GMOs). This includes adherence to the Pakistan Environmental Protection Act 1997, the Pakistan Biosafety Rules, 2005 (amended in 2024), and the National Biosafety Guidelines, 2005 (amended in 2024). The centre may play a critical role in overseeing and monitoring GMO-related research activities throughout Pakistan. The Biosafety Center may serve as a key regulatory body, providing guidance and oversight to ensure compliance with national and international biosafety standards. The center may also facilitate training and capacity-building initiatives for researchers and regulatory personnel, promoting best practices in biosafety and risk assessment. Further Biosafety Center may support research and development in biotechnology and GMOs through funding and incentives by encouraging public and private sector partnerships to drive innovation in the field of biotechnology.

2. Sustainable BCH Portal Maintenance

Ensuring the long-term sustainability of the BCH portal is critical to keep it up to date with the latest biosafety developments, decisions, and risk assessments. The portal needs to evolve continuously to reflect changes in GMO regulations, technological advancements, and new biosafety data. A dedicated team of professionals is ensuring that the portal remains a reliable and authoritative resource for stakeholders, including researchers, regulators, and the public.

3. Regular Licensing and monitoring of GMO imports for FFP

The import of genetically modified organisms (GMOs) for food, feed, or for processing (FFP), particularly GM soybean, is crucial for Pakistan's agricultural and food security due to the country's insufficient domestic production. The U.S. is a key supplier, known for its high-

quality GM soybean varieties. The long-term objective for the import of GMOs for FFP is to establish a streamlined, well-regulated framework that supports the safe and efficient importation of GM crops like soybean, ensuring compliance with both national biosafety regulations and international standards such as the Cartagena Protocol. By creating this framework, Pakistan can safeguard public health while benefiting from the economic advantages of importing high-quality GM products for food, feed, or for processing purposes. Additionally, the goal includes enhancing collaborations with international bodies and local stakeholders to align the country's import practices with global trends, ensuring that Pakistan remains a key player in global agricultural markets.

4. Regular licensing and Monitoring of laboratory manipulation work

With the rise of biotechnology and genetic research, universities and research institutions in Pakistan are increasingly engaging in genetic manipulation work to advance fields such as agriculture, medicine, and environmental sciences. This research often involves the use of genetically modified organisms (GMOs) to develop improved crop varieties, study disease mechanisms, and explore innovative biotechnological solutions. As more academic institutions invest in genetic research, there is a growing need for a structured licensing system to regulate and monitor laboratory activities involving genetic manipulation. The regular licensing of laboratory manipulation work is essential to ensure that these activities comply with national biosafety guidelines, safeguarding both public health and the environment. Licensing provides a framework to assess the risks associated with genetic engineering experiments, ensuring that universities and research centers follow established safety protocols and maintain transparency in their research practices.

5. Regular Licensing and monitoring of GMO field trials

Field trials play a crucial role in the development and testing of genetically modified organisms (GMOs), particularly in the agricultural sector. Universities, research institutions, and private companies in Pakistan are increasingly involved in conducting field trials to assess the environmental, agronomic, and safety impacts of GM crops before their commercialization. However, conducting field trials with GMOs requires a stringent regulatory framework to ensure safety and compliance with national biosafety standards. The licensing of field trials ensures that all necessary precautions are taken to mitigate potential risks to the environment and surrounding ecosystems. This licensing process also promotes transparency, accountability, and public trust in the development of genetically modified crops, supporting both national biosafety regulations and international obligations under the Cartagena Protocol.

6. Regular Licensing and Monitoring of GMOs for Commercialization

Many companies and research organizations in Pakistan are eager to commercialize their work in genetically modified organisms (GMOs), particularly in agriculture. These entities aim to bring to market genetically engineered crops that offer enhanced traits such as pest resistance, higher yields, or improved nutritional value. Commercialization allows these innovations to be scaled up for widespread agricultural use, contributing to national food security and economic growth. However, the commercialization of GMOs requires strict regulatory oversight to ensure that products entering the market are safe for human consumption, the environment, and biodiversity. Licensing for commercialization is a critical step in this process, providing a structured pathway for companies to demonstrate compliance with biosafety regulations. By enforcing commercialization licensing, Pakistan can foster

innovation while ensuring that GMO products are responsibly introduced into the marketplace, balancing economic development with public and environmental safety.

7. International Collaborations

Establishing collaborations with international biosafety organizations is vital for GMO regulation and research. The long-term goal is to foster partnerships that facilitate the exchange of knowledge, best practices, and resources. Collaboration with global institutions will also enable Pakistan to contribute to and benefit from international efforts to improve GMO safety, risk assessment, and regulatory practices. By participating in international forums, Pakistan can ensure that its biosafety regulations are aligned with global standards.

8. Capacity Building and Awareness Programs

Capacity building and awareness-raising are essential for ensuring that stakeholders in Pakistan, such as researchers, regulatory bodies, and the public, are aware of the biosafety guidelines and the obligations under the Cartagena Protocol. The long-term goal is to create a robust training and education framework that supports the ongoing development of biosafety expertise in the country. This will include regular workshops, seminars, and outreach programs aimed at building a national network of biosafety professionals who can contribute to the safe and effective management of GMOs.

9. National and International Reporting

Meeting the reporting obligations under international agreements, such as the Cartagena Protocol on Biosafety, will be a key long-term goal. This involves setting up systems for gathering data, conducting risk assessments, and submitting comprehensive reports on GMO activities in the country. These reports will be essential for maintaining transparency and accountability at the national and international levels. By adhering to global biosafety reporting standards, Pakistan will ensure that its regulatory framework remains credible and internationally recognized.

10. Notification of Field Trials Sites

The notification of GM field trial sites by Pak-BCH is a critical measure to ensure the safe and contained use of genetically modified organisms (GMOs). By publicly designating these sites, Pak-BCH enhances transparency, allowing the public and regulatory authorities to be aware of where GM field trials are being conducted. This process not only promotes safe practices but also facilitates monitoring and risk assessment, ensuring that all GMOs remain confined to designated areas and pose no unintended environmental or health risks. Furthermore, public notification helps to foster trust and openness regarding the research and development of GM crops in Pakistan.

11. Registration of Farms Involved in the Production of GM Products

The registration of all public and private farms involved in the production of GM products is an important regulatory step to maintain oversight and accountability in GMO cultivation. Registered farms will be subject to regular monitoring and compliance checks to ensure they adhere to biosafety regulations and practices. This process ensures that GM crops grow under controlled conditions, minimizing risks to the environment and neighboring crops. Registration also facilitates tracking and traceability, allowing regulators to monitor the flow and impact of GM products from farm to market.

12. GM Certification of Labs

Pak-BCH will be responsible for certifying laboratories that are involved in GMO-related activities, ensuring that these labs meet the necessary standards for safety, accuracy, and regulatory compliance. Certification will be based on rigorous assessments of lab procedures, equipment, and personnel, ensuring that they are capable of handling GMOs in a safe and scientifically sound manner. This certification process helps to standardize practices across all labs working on GMOs, fostering high-quality research and development while mitigating risks associated with genetic manipulation. Certified labs will be recognized for their capability to conduct reliable and safe GMO testing, research, and development.

ACHIEVEMENTS

Pak-BCH is playing a pivotal role in regulating GMO-related research activities in Pakistan, ensuring the safety of human beings, animals, and the environment in compliance with CPB. Pak-BCH has made significant achievements in regulating GMOs:

1. Pak-BCH facilitated the constitution of 54 IBCs by engaging with organizations involved in GMO/LMO research, ensuring compliance with the Pakistan Biosafety Rules, 2005 (amended 2024).
2. The Biosafety Clearing House (Pak-BCH) web portal (<https://bch.environment.gov.pk>) has been developed and will be launched soon. All applicants will be required to submit applications related to genetic manipulation work, field trials, commercialization, and import of GMOs for food, feed, or for processing (FFP) through the Pak-BCH web portal through IBC login at bch@environment.gov.pk.
3. The BCH has accelerated the GMO approval process by conducting NBC and TAC meetings regularly.
4. Regular inspections of approved GMO-related projects have led to improved compliance with the Pakistan Biosafety Guidelines, 2005 (amended 2024), with organizations upgrading their facilities accordingly.
5. Pak-BCH has actively participated in biosafety meetings with major research institutes and private seed companies, enhancing biosafety compliance in Pakistan.
6. During 2024-25, approval of 62 cases of Genetic manipulation work, 48 cases of GMOs field trials, and 18 cases of GMOs commercialization have been granted.
7. Currently, biosafety licenses for forty-seven (47) GM soybean events were issued to sixty-seven (67) importers to import GM soybean grains for FFP in compliance with Article 15(3) of the CPB. This process ensures that transboundary movements of GMOs are regulated, safe, and compliant with international biosafety standards.
8. To date, 504 import permits have been issued for the import of 2,126,884.578 MT of GM soybean grain in Pakistan.

9. Pak-BCH initiated a series of IBC training workshops to enable notified IBCs to submit applications online through the Pak-BCH portal and to guide IBCs regarding proper IBC notification in compliance with Rule 8 of the Pakistan Biosafety Rules 2005 (amended 2024) and function as per Rule 9.
10. Pak-BCH has launched a quarterly newsletter titled "Genome" to highlight the activities of Pak-EPA and Pak-BCH. So far, four editions of the Genome newsletter have been published.

UPSCALING OF GREEN PAKISTAN PROGRAM (UGPP), PHASE-I.

Introduction:

Upscaling of Green Pakistan Program, Phase-I (July 2019-June 2023) is an umbrella project of Government of Pakistan and is being implemented across the country with the overall objectives to revive forestry and wildlife resources in the Pakistan. The total cost of the programme is Rs. 125.1843 billion. All provinces except AJK and GB are sharing 50% cost in the field interventions. To complete the first phase, the project was granted two years no cost extension July 2023-June 2024 and July 2024-June 2025.

Goals and Targets:

The main objectives of the programme are to facilitate transition towards enhancing natural capital and environmentally resilient Pakistan through main streaming notions of adaptation and mitigation, ecological restoration as well as carbon sequestration and earning carbon credits. The current phase (July 2019- June 2013) was designed to enhance national forest cover with the total target of 3.29625 billion plants altogether from afforestation, reforestation, forest regeneration and strengthening the protected areas network focusing the wildlife Watch and Ward.

Activities:

A. Forestry Component

The forestry component of the program aims at enhancing forest cover through afforestation, reforestation and regeneration to curb the impacts of climate change. The priority areas for the purpose are:

- Conserve and develop forests and other renewable natural resources so as to meet the needs of local communities for timber, firewood and fodder production.
- Increase the incomes of local people from the sale of forest products and services and provide gainful employment opportunities to the local people close to their places of residence.

- Improve the quality of local human environment.
- Increase the rangeland/pastures productivity & other related services and functions.
- Enhance the protective functions of watersheds for regulating their water regimes, retarding soil erosion and siltation of reservoirs and protecting downstream agriculture and infrastructure from flood damages.
- Assist the Government of Pakistan in meeting the obligations of relevant International Treaties and Conventions, such as Convention on Biodiversity, the Climate Change Convention, and the Desertification Convention etc.
- Provide and conserve habitat for wildlife species.

B. Wildlife Component

Wildlife protection and conservation is an important component of Upscaling of Green Pakistan Programme. The following are the main focused thematic areas addressed under the wildlife component.

- Enhanced management of Protected Areas (Biosphere Reserve/ National Parks) with special focus on Eco-tourism.
- Revival of Critically Endangered Habitats (at least one habitat in each province/territory).
- Improvements of Wildlife related Legislations and its implementation.
- Curbing of illegal wildlife trafficking through establishment of control desks in international/national airports.
- Rehabilitation/ Rescue Centers for confiscated wildlife in each province/ territory.
- Zero plastic in protected area.
- Engagement of academia in wildlife conservation activities.

Achievements:

A. Forestry Component

Out of the total target of planting 3296 million in the current phase of the project from afforestation, reforestation, plant distribution and regeneration, the provinces and federal territories reported 39.47 million plants during 2024-25. This makes the total accumulative achievement of 2253 million plants. In addition, the program also provided 240,877-man months green jobs opportunities to the local communities during the reporting year. The independent third-party consortium of IUCN, WWF and FAO revealed an overall 83% survival rate of the plantation.

B. Wildlife Component

During FY 2024–25, the UGPP Wildlife Component made substantial progress in strengthening Pakistan’s Protected Area network and enhancing wildlife management. In Balochistan, Takatu National Park was notified as a new protected area. In Gilgit-Baltistan, one Community Controlled Hunting Area (CCHA) was established while in Khyber Pakhtunkhwa, four Community Game Reserves (CGRs) were notified to promote community-based conservation. Collectively, under the Protected Areas Initiative (PAI), a total of 115 Protected Areas (PAs) covering 40,058.297 sq. km were notified across Pakistan.

In Punjab, the program successfully organized eight capacity-building events and four mass awareness campaigns to engage stakeholders and local communities. In Balochistan, wildlife component focused on strengthening wildlife infrastructure through the establishment of six wildlife check posts, eight ecotourism huts and 60 kacha water ponds along with the implementation of 28 small-scale community development projects.

In Khyber Pakhtunkhwa, targeted interventions were made to improve institutional capacity and governance. These included the capacity building of provincial wildlife departments, hiring of consultants for drafting rules, facilitation of three interprovincial coordination initiatives for data collection and enforcement and training of staff and stakeholders through four specialized sessions on Wildlife Acts and Rules in the province.

Way forward

The programme has achieved approximately 68.4% of the forestry and 68% of the wildlife component targets against the actual release of 46% funds (both PSDP and ADP).

To achieve the remaining targets of the first phase, the revised programme has been recently approved by ECNEC with a total cost of 122.146 billion (2024-2028) with the following broader components.

- A. Enhance natural capital, through forest restoration on state, guzara, protected, reserve, communal, private, farm, community forests and range lands.
- B. Conserve and manage biodiversity on sustainable basis and the fair and equitable sharing of the benefits arising from the use of genetic resources such as conservation of wildlife, promoting non timber forest products (collection, processing and marketing) and other nature-based enterprises.
- C. Promote Carbon Financing Mechanism at the national levels for sustainable forest management.
- D. Standardized resource assessment and data collection through application of GIS and remote sensing technology for informed decisions and scientific management of forestry resources.
- E. Meet the Pakistan’s committed national and international obligations under various international agreements and treaties.

- F. Knowledge Management, Linkages, Capacity Building and National/ International Exchange Programme for cross fertilization.
- G. Strengthen institutional framework aiming at reforms in policy, legal and financial management system. H. Monitoring, Evaluation and learning.

CAPACITY BUILDING ON WATER QUALITY MONITORING AND SDG 6 (6.1) REPORTING

Introduction:

The Ministry of Climate Change & Environmental Coordination of Pakistan has recognized the urgent need to tackle water quality challenges. In response, Ministry of Climate Change & EC in collaboration with Korea International Cooperation Agency (KOICA) initiated a project (2021-2026) titled as: Capacity Building on Water Quality Monitoring and SDG6(6.1) Reporting that aims to enhance Pakistan's ability to monitor and improve water quality while aligning with Sustainable Development Goals (SDGs) 6.1 and 6.2. This project is essential to Pakistan's commitment to SDG 6.1 and supports broader initiatives in climate-resilient WASH, sanitation policy reforms, and strengthening legal and administrative frameworks in the water sector.

This project has strengthened water quality monitoring, surveillance and management system as per SDG 6 along with strengthening institutional and policy arrangements. Capacity on water quality monitoring and testing has been developed for the identified stakeholders benefitting the marginalized sections of society across urban and peri-urban municipalities and local governments in Punjab, Khyber Pakhtunkhwa, with a focus on improving the drinking water quality and access to safe drinking water. WASH remains a strategic, long-term priority and is a core component of the National Climate Change Policy (NCCP) 2021 and key government initiatives such as the 5E Framework and URAAN Pakistan. Continued integration of WASH into national and subnational planning is essential to addressing Pakistan's water security challenges, improving sanitation infrastructure, and promoting hygienic practices, particularly in regions most vulnerable to climate change.

Objectives of project:

The project aims to:

- Develop and establish a national and provincial drinking water quality monitoring and surveillance management system.
- Strengthen the capacity of the WASH Cell within MoCC&EC and Public Health Engineering Departments (PHEDs) to track progress on SDG 6.1 (universal and equitable access to safe drinking water).

- Enhance water quality monitoring infrastructure and ensure effective reporting mechanisms at the national and provincial levels.
- Improve human resource capacity through training programs for professionals involved in water quality management.

Goals and Targets

- Effective water quality monitoring, surveillance and management system are in place.
- Institutional and policy arrangements for water quality monitoring.
- A periodic IT based reporting mechanism on water quality monitoring is established.
- Capacity on water quality monitoring and testing is developed for the identified stakeholders.

Deliverables/ outcomes of project:

1. Developed Baseline for water quality laboratories under, KP, Punjab and Federal EPAs.
2. Provided Laboratory water quality testing high quality equipment to 36 labs (36 Districts) in Punjab and 8 (8 divisional) labs in KPK.
3. Invitational Training Program in Korea Consisting of High level, Mid-level and Master Trainers has been conducted for official (MoCC&EC, PEPA, PCRWR, HUD & PHED in Punjab, LG & CDD in Punjab and PHED in KP).
4. Master Training Program for 90 days has been conducted for provincial and Federal lab staffs in Korea and train them on equipment.
5. Local trainings of Laboratories staff for the equipment was conducted with PCRWR (210 staff trained).
6. Development of SOP (Standard Operating Procedures) for 45 laboratories of PCRWR, PEPA, and PHED in Punjab and KP in coordination with KOICA is under process.
7. Developed Management Information System (MIS) for water quality reporting and tracking of operational activities of water quality of all PHEDs.
8. Provide Nine Mobile water testing labs - 8 for KPK and 1 for PCRWR federal.
9. Conducted study on: Recommendations for Improving Pakistan's Legal and Administrative Systems related to SDG6.
10. Conduct a research survey study and development of Statistic report on Water quality of Islamabad to increase public awareness and to prioritize policy interventions according to findings.

Way Forward:

- Monitoring and Evaluation of project by Korean Team of KOICA and PMU of Pakistan.
- Revision of WASH policies: National Drinking Water Policy 2009, National Sanitation Policy 2006 and formulation of National WASH Policy.
- Development of Climate rationale for WASH sector and SDG 6 (linking WASH sector to Climate Change Scenario).
- Data consolidating and Reporting on water: National Economic Survey, UN WATER Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS) Survey, Joint monitoring Program (JMP).

Shazia Mir
Section Officer-Coord/Council
Monday, 02 March, 2026, 10:9:31 AM

2.2. Environment & Climate Change Wing

National Climate Change Policy (NCCP) 2021

The National Climate Change Policy (NCCP) was initially formulated in 2012 and revised in 2021. It serves as a key document outlining the country's strategy to combat climate change and enhance climate resilience. The National Climate Change Policy Implementation Committee (NCCPIC) oversees the implementation of NCCP at the national level. The key recent developments made by the committee include: Ninth (9th) meeting of the NCCPIC (held on October 31, 2024), chaired by the Minister for Law and Justice, focused on addressing the issue of emissions mitigation strategies in the transport sector. Consequently, the 10th meeting of the NCCPIC (held on 8th January 2025) prioritized improving air quality through a reduction in emissions. The Provincial governments have established Climate Change departments and policies to align with NCCP decisions. MoCC&EC and provincial governments have initiated various low-carbon and resilience-building projects across sectors like water, energy, agriculture, and transportation. The NCCP's Implementation Framework outlines targets and projects for addressing climate change impacts in short, medium, and long-term efforts across all socio-economic sectors. The updated NCCP-2021 represent Pakistan's proactive commitment to addressing climate challenges through an integrated, inclusive, and forward-looking approach balancing adaptation, mitigation and sustainable priorities.



Meeting on Review and Implementation of the National Climate Change Policy chaired by Secretary, MOCC&EC

Pakistan Green Building Code 2023

MoCC&EC, in collaboration with UN-Habitat, Pakistan Engineering Council, and other relevant stakeholders, has formulated the Pakistan Green Building Code (GBC) 2023, which provides guidelines and a roadmap for sustainable design and construction of environment-friendly and energy-efficient buildings. The Ministry is collaborating with the Ministry of Science & Technology and has responded to the queries of the Cabinet on the Green Building Code. The GBC 2023 has been approved by the Cabinet on 28-07-2025. The GBC focuses on making building infrastructure more climate resilient, energy efficient, and health and environment friendly.

Green building prescribes a holistic, integrated design approach, in which the project team architects, interior designers, engineers, O&M Staff, occupants, and the client view the building as a whole system. From the start, design, construction, O&M, and demolition are considered and evaluated to optimize the environmental and economic performance of the building, over the entire life cycle of the building to accurately measure its economic, environmental& social costs.



Workshop on Review and Implementation of Pakistan Green Building Code

Social Benefits

1. Improved air, thermal, and acoustic environments
2. Enhanced occupant comfort, well-being and health
3. Increased worker productivity

4. Reduced employer liability due to healthier indoor environments
5. Contributions to community health, vitality, and aesthetics

Economic Benefits

6. Annual savings to building owners/tenants through reduced operation costs and increased operation and maintenance efficiencies over conventional buildings
7. Enhanced asset value and profits
8. Improved employee productivity and satisfaction
9. Creation of new local industries and jobs

Environmental Benefits

10. Minimization of local ecological degradation (habitat, air, soil, and water) by protecting natural habitats through efficient site and building design, sustainable construction practices, low-impact building materials, and sustainable landscaping and construction practices
11. Improved air and water quality
12. Reduction of solid waste
13. Conservation of energy, water, and other natural resources
14. Pakistan's Urban Resilience Policy Framework

Pakistan's Urban Resilience Policy Framework provides overarching policy guidelines for sustainable and resilient urban development for climate preparedness. The policy framework aims to support sustainable urban development across Pakistan by adopting sustainable mitigation strategies, practical adaptation policies, plans, and projects in the context of local economic, environmental, and social circumstances that align with global development frameworks. Its key objectives include: (a) Provision of a national-level framework that leads to resilient urban centers across Pakistan, (b) Supports effective and comprehensive mitigation measures, (c) Facilitates the incorporation of Adaptation measures in future urban development and (d) Guides local institutions along with the preparation of an action plan. Consultations on the Draft Framework are underway in coordination with provincial governments. Accordingly, the Summary for the Final Framework will be forwarded to the Cabinet after due endorsement of provincial governments.

National Adaptation Plan

The Government of Pakistan (GoP) is advancing national climate resilience through the implementation of the *National Adaptation Plan (NAP) 2023*. The NAP provides a strategic framework focusing on six key areas: the agriculture-water nexus, natural capital, disaster risk management (DRM), urban resilience, human capital, and gender, youth, and social inclusion. Budgeting has been completed for the NAP 2023 to guide implementation and investment priorities. Project concept notes have been developed and are being pitched for resource mobilization to operationalize key interventions under the NAP. Additionally, two district-

level adaptation plans have been prepared to localize climate action. The overarching focus remains on strengthening climate resilience across the country's development sectors.

The agreement between the Governments of the Shanghai Cooperation Organization (SCO) member states on cooperation in the field of environmental protection was signed during the meeting of the Council of Heads of States (CHS) on July 04, 2024, in Astana. The key aim of the SCO agreement on environmental protection is to promote collective efforts to address shared environmental challenges, enhance ecosystem protection, and advance sustainable development. Its main objectives include: (a) Strengthening environmental governance and frameworks, (b) Facilitating knowledge sharing and capacity building, (c) Initiating joint projects on climate change, pollution, and biodiversity, (d) Aligning with global frameworks like the Paris Agreement and (e) Enhancing regional cooperation on transboundary issues.



Meeting of the SCO Member State

MoCC&EC has signed the Memorandum on Cooperation in the field of environmental protection with the Ministry of Natural Resources & Environmental Protection of the Republic of Belarus. The main objective of this MoU is to create favorable conditions for long-term cooperation in the field of environmental protection for the mutual benefit of the two countries in accordance with this Memorandum. This initiative aims to reduce the negative anthropogenic impact on the environment, ensuring favorable living conditions and improving the natural environment by promoting principles of the green, circular, and low-carbon economy. It focuses on mitigating and adapting to climate change across various economic sectors while protecting air quality, fauna, and flora (particularly endangered species), as well as managing protected areas like nature reserves and national parks. Additionally, it encourages ecological tourism, industrial waste management, urban greening, and education on environmental protection and sustainable resource use, alongside any other areas of cooperation deemed relevant.



Signing of Memorandum with the Ministry of Natural Resources & Environmental Protection of the Republic of Belarus in the field of Environmental Protection

Country Programme Framework 2024-28

(Global Green Growth Institute (GGGI)) The Global Green Growth Institute (GGGI) is a treaty-based organization promoting green growth by balancing economic development with environmental sustainability. It supports poverty reduction, job creation, social inclusion, and environmental sustainability, focusing on energy, water, land use, and green cities. Pakistan has been a member since 2021 and has become the 41st Member of GGGI. In parallel discussions to CPF, GGGI has been overseeing the implementation of two projects in Pakistan:

1. Supporting Preparedness for Article 6 Cooperation (SPAR6C) Programme (2022-2027): An EUR 20 million multicounty project funded by the German Federal Ministry for Economic Affairs and
2. Climate Action (BMWK). The Programme is managed by GGGI and implemented in Pakistan by the UNEP



Signing of Country Programme Framework 2024-28 (COP-29)

Formulation of National Urban Strategy and Guidelines to Reduce the Impacts of Urban Flooding, Droughts, and Climate Disasters in Pakistan

The project titled “Formulation of National Urban Strategy and Guidelines to Reduce the Impacts of Urban Flooding, Droughts, and Climate Disasters in Pakistan” is an ongoing initiative of UN-Habitat, financed by the Adaptation Fund Board, and has been active in Pakistan since December 2020. The Ministry of Climate Change and Environmental Coordination (MoCC&EC) is responsible for implementing one of the project’s key outputs.

A grant amounting to USD 383,000 has been secured from the Adaptation Fund Board through UN-Habitat for this component, which is proposed to be included in the Public Sector Development Programme (PSDP) 2024–25 as a rupee cover for the scheme. The overall Adaptation Fund (AF) project comprises six implementing partners, most of whom have initiated and, in some cases, completed their respective outputs. However, the MoCC&EC’s component is yet to be initiated.

The Ministry has already signed a Letter of Understanding (LoU) with UN-Habitat for the implementation of Component 3 of the AF project. To commence field activities, the transfer of funds from UN-Habitat to MoCC&EC is awaited. Implementation of this component will enable the Federal Government and MoCC&EC to enhance urban management, environmental governance, and climate resilience. The project aims to develop comprehensive policy guidelines for sustainable urban development, focusing on improving environmental quality, promoting adaptive measures for climate change, and reducing risks associated with urban flooding and droughts.

This component is part of the broader Adaptation Fund Project titled “Enhancing Community, Local, and National-Level Urban Climate Change Resilience to Water Scarcity Caused by Floods and Droughts in Rawalpindi and Nowshera Districts”, operational since December 2020 in collaboration with UN-Habitat.

2.3. Forestry Wing

Introduction:

Forestry Wing Introduction: The Wing is headed by Inspector General Forests (BS-21) who is assisted by two Deputy Inspector General Forests (BS-19), Conservator Wildlife (BS-19), Director Biodiversity (BS-19), Assistant Inspector General Forests (BS-18), two Deputy Conservator Wildlife (BS-18), Deputy Director Biodiversity (BS-18) and Assistant Secretary-Wildlife (BS-17). In accordance with Rules of Business (Amended), 2012

Role & Function:

Forestry Wing is mandated to perform following functions as in the capacity of technical wing of the Ministry of Climate Change: National policy, plans, strategies and programmes regarding ecology, forestry, wildlife, biodiversity and desertification, and; Coordination, monitoring and implementation of environmental agreements with other countries, international agencies and forums.

Goals and Targets:

Forestry is responsible to compliance under the key international conventions and protocols: United Nations Convention to Combat Desertification (UNCCD); Convention on Biological Diversity (CBD), including its supplementary protocols: Nagoya Protocol on Access and Benefit-Sharing, Biodiversity Beyond National Jurisdiction (BBNJ) and Cartagena Protocol on Biosafety; Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES); Convention on the Conservation of Migratory Species of Wild Animals (CMS); and the Ramsar Convention on Wetlands. In addition, Pakistan has entered into several bilateral agreements and collaborations in the forestry and environmental sector with countries including China, Turkey, Iran, and the Kingdom of Saudi Arabia (KSA), aimed at promoting afforestation, sustainable forest management, capacity building, and regional cooperation on environmental challenges. Key national-level initiatives and actions include:

- Policy formulation and execution in the forestry and biodiversity sectors
- Implementation of the National Forest Policy
- Development and execution of the National Biodiversity Strategy and Action Plan
- Enforcement of the Pakistan Trade Control of Wild Fauna and Flora Act, 2012 (CITES legislation)
- Green Pakistan Programme (Revival of Forestry and Wildlife Resources in Pakistan)
- Coordination of inter-provincial and inter-ministerial tree planting campaigns
- Community-Managed Trophy Hunting Programme for conservation and community development
- Administration of conservation funds, including the Mountain Areas Conservation Fund (MACF) and the Fund for Protected Areas (FPA), both governed by Boards of Directors
- Execution of Assembly business, including implementation of Cabinet decisions, Presidential directives, Prime Minister's directives, and recommendations from National Assembly and Senate Standing Committees
- Establishment and coordination of the National Taskforce on Coral Reefs

ACTIVITIES & ACHIEVEMENTS (2024-2025):

- I. Pakistan has submitted its Voluntary National Report to the United Nations Forum on Forests (UNFF). This marks a significant step in aligning national forest policies with global sustainable forest management goals and enhancing transparency in forest governance.
- II. Preparatory work has commenced on the PRAIS Report 2026 under the UNCCD framework. This reflects Pakistan's proactive approach to reporting progress on land degradation neutrality and sustainable land use.
- III. Pakistan has been officially included as a member of the Steering Committee of the Riyadh Partnership for Drought Resilience. This inclusion strengthens Pakistan's role in regional environmental cooperation and joint green initiatives.
- IV. Pakistan has ratified the Intergovernmental Ministerial Committee (IMC), and the Middle East Green Initiative (MGI). These ratifications affirm the country's commitment to cross-border environmental collaboration, regional afforestation, and climate resilience efforts.

Policy and regulatory Measures:

- I. National Action Plan for Forest Landscape and Restoration: Pakistan has prepared a National Action Plan for Forest Landscape and Restoration. The plan prioritizes strategic actions for FLR through domestic and donor funding to mitigate climate change-related disasters, as seen in recent flood damages, which totaled up to USD 46 billion of loss.
- II. National Drought Plan Pakistan: National Drought Plan has been developed and finalized and adoption is in process.
- III. National Bamboo Strategy and Action Plan: As a member of the International Network on Bamboo and Rattan (INBAR), Pakistan has assessed its bamboo resources with INBAR's financial support and Bamboo Strategy and Action Plan has been finalized.
- IV. Amendments in Biosafety Rules and Guidelines (2005): Through consultations with stakeholders, academia, and research institutions, Pakistan revised its Biosafety Rules 2005 and Guidelines 2005 to streamline approval processes for Genetically Modified Organisms for Food, Feed, and Processing (GMOs FFP). Consequent upon approval of the Summary by the Cabinet, the amendment in biosafety rules has been notified (SRO 45).
- V. The Biosafety Guidelines are amended by adding a chapter (Chapter 14 of the Guidelines) to cater the needs of import of GMOs FFP. Further, a guiding document (SOPs) are developed for facilitation of importers soliciting license for GMOs FFP.
- VI. Biodiversity Conservation Planning: The NBSAP is a policy document to supporting biodiversity conservation and sustainable use. According to new global targets, there is a need align the NBSAP with Global Biodiversity framework). The alignment

process of NBSAP is underway. An interim response is submitted to the Secretariat of the Convention on Biological Diversity.

Projects, Programs and Implementation:

- a) Pakistan has notified two new UNESCO Biosphere Reserves, bringing the total to four. Additional sites are currently under review for designation under UNESCO's Man and the Biosphere (MAB) Programme.
- b) Upscaling Green Pakistan Program (GPP): MoCC & EC is implementing the - Upscaling Green Pakistan Program, Phase I, nationwide. It has successfully achieved the target of sowing, regrowing, and distributing 2.2 billion plants across Pakistan during the year 2024-2025. A third-party monitoring revealed a success rate of 75% to 95%. The photographs on Monsoon Tree Plantation Campaign 2025 under the major theme of "Ek Beti, Ek Shajar".



Figure 1: Dr. Musadik Malik, Federal Minister MoCC, kicked off the Monsoon Tree Plantation Drive in Karachi



Figure 2: Vision School kids plantation drive in collaboration with CDA at Ankara Park, Islamabad



Figure 3: Federal Secretary Ms. Aisha Humera Chaudhary, kicked of Monsoon Tree Plantation drive at Lahore

Figure 4: Degree College Abbaspur Plantation Drive in Collaboration with Forest Department Rawalakot, AJ&K

- c) Reversing Deforestation and Forest Degradation in High Chilgoza Pine Forests: The project implemented in collaboration with FAO, A project on conservation of Chilgoza forests in Balochistan, KP and GB has been implemented in collaboration with FAO. The project has directly benefited 8,443 households. In addition, the project has assisted natural regeneration over 2153 ha (4 million seedlings) and plantation of fruit and forest seedlings on 653 hectares.
- d) Pakistan is currently in the second phase of its Land Degradation Neutrality (LDN) Target Setting process, focusing on refining and updating targets using enhanced spatial data and improved national baselines to ensure more accurate monitoring and planning.
- e) During 2018-2023, the Pakistan Snow Leopard and Ecosystem Protection Program (PSLEP) project was being implemented through SLF. However, the project was suspended in 2021 due to audit observations. In June 2024, after thorough consultation, UNDP has requested GEF's approval through this ministry for project resumption, which is currently under consideration.

Regulation of Wildlife Trade: During this FY, the CITES Management Authority, held three meetings for wildlife trade regulation. Consequently, an amount of Rs. Rs.7,471,000 was collected in wildlife import/export fees and deposited into the government exchequer.

2.3. International Cooperation Wing

The International Cooperation (IC) Wing of the Ministry of Climate Change & Environmental Coordination (MoCC&EC) comprises three sections and a dedicated COP Cell. Each unit is mandated to perform the following functions:

1. International Cooperation Section:

This section is responsible for coordination with international donor agencies on environmental and climate-related matters. Its functions include negotiation, signing, and implementation of Memoranda of Understanding (MoUs), handling issues related to the GSP Plus framework, and representing Pakistan at international forums in connection with ratified conventions and protocols.

2. Chemicals Section:

The Chemicals Section is mandated to facilitate and support the implementation of international chemicals and waste-related conventions (as listed below). The section coordinates national obligations, policy measures, and reporting requirements under these multilateral environmental agreements with respect to the following Conventions / international instruments:

- I. Basel Convention on the control of trans-boundary movements of hazardous wastes and their disposal
- II. Stockholm Convention on Persistent Organic Pollutants
- III. Rotterdam Convention on the Prior Informed Consent Procedure for certain hazardous chemicals and pesticides in international trade
- IV. Minamata Convention on Mercury
- V. Global Framework on Chemicals: Voluntary framework
- VI. Montreal Protocol on Substances that Deplete the Ozone Layer
- VII. Intergovernmental Negotiating Committee (INC) on Plastic Pollution

3. COP Cell:

Recognizing the Conference of the Parties (COP) as a mandatory international process, a dedicated COP Cell has been established under the IC Wing. The Cell facilitates Pakistan's reporting obligations to the UNFCCC and ensures effective coordination and streamlining of COP-related processes. Its core responsibilities include tracking and supporting negotiations on key thematic streams such as climate finance, adaptation, mitigation, transparency, and related agenda items.

4. National Ozone Unit (NOU):

The National Ozone Unit (NOU) was established in 1996 following Pakistan's signing and ratification of the Vienna Convention and the Montreal Protocol on Substances that Deplete the Ozone Layer. The NOU is responsible for formulating and enforcing policies and regulatory measures to control and regulate the import of Ozone-Depleting Substances (ODS), as well as facilitating the transition of ODS-dependent industries to ozone-friendly technologies.

A. IC Section:

The details of the activities undertaken and achievements accomplished by the International Cooperation (IC) Wing during the year **2024–25** are outlined below:

1. The list of Agreements, Memoranda of Understanding (MoUs), and Protocols signed during 2024–2025 is as follows:

S. No.	Name of Agreement /MOU/Protocol	Date of Signing
1	Agreement with the Governments of the SCO Member States on cooperation in the field of Environmental Protection	04 July, 2024
2	Establishment Agreement of the International Mangrove Center	06 th November 2024
3	Memorandum of Cooperation in the field of environmental protection with the Ministry of Natural Resources and Environmental Protection of the Republic of Belarus and the Ministry of Climate Change & Environmental Coordination of the Islamic Republic of Pakistan	26 th November 2024
4	Protocol of Intention with Azerbaijan for Cooperation in the field of environmental cooperation	24 th February 2025
5	MOU between Future Leaders Network (a non profit company registered in UK) and Ministry of Climate Change & Environmental Coordination of the Government of Pakistan on Youth (Youth Negotiators Academy - Climate Youth Negotiator Programme 2025)	29 th April, 2025

B. COP Cell:

Pakistan at 29th session of the Conference of the Parties (COP29):

- A high-level delegation of Pakistan, led by the Hon'ble Prime Minister of Pakistan, participated in 29th Session of Conference of Parties (COP29) to the U NFCCC held from 11-22 November 2024 in Baku, Azerbaijan. Ministry of Climate Change and Environmental Coordination (MoCC&EC) established Pakistan's Pavilion at COP29, which served as a dynamic platform for global engagement through panel discussions, side events, and networking sessions, showcasing Pakistan's climate commitments, policy initiatives, and international partnerships.

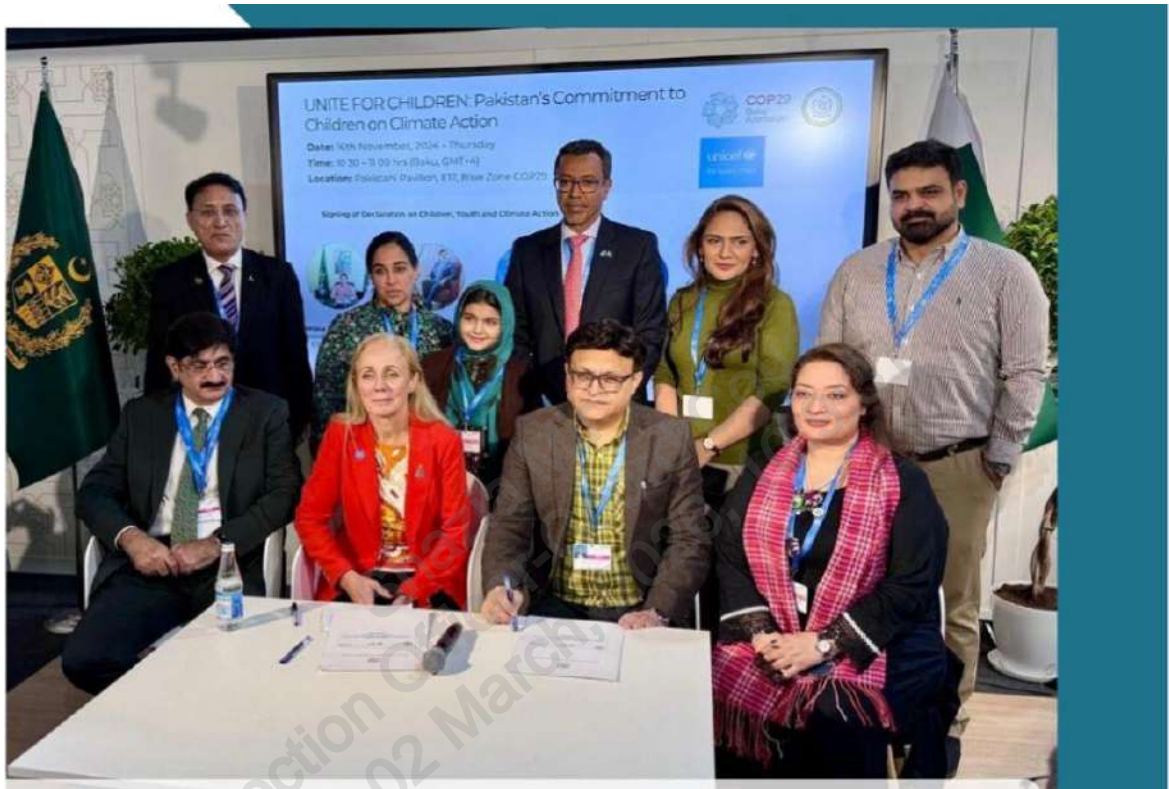


Pakistan at COP29: Leadership and Commitments



Prime Minister Muhammad Shehbaz Sharif met the Prime Minister of the Czech Republic, Petr Fiala, on the margins of the World Leaders Climate Action Summit in Baku on November 12, 2024.

- At COP29, Pakistan played an active role in advancing the interests of developing countries, working closely with the G77 & China and the Like-Minded Developing Countries (LMDC) group. Pakistan consistently emphasized equity and Common but Differentiated Responsibilities (CBDR) across negotiations.
- Pakistan engaged actively on key issues including climate finance (NCQG), carbon markets, adaptation, just transition, and loss and damage. On the NCQG, Pakistan supported the call for USD 1.3 trillion annually by 2030, with significant grant-based finance, and opposed restrictive conditionalities. While a compromise of USD 300 billion annually by 2035 was agreed, Pakistan noted that this falls far short of developing countries' needs.
- On Just Transition, Pakistan advocated for an inclusive, nationally determined approach covering adaptation and means of implementation, supported primarily through public finance. As consensus was not reached, the Just Transition Work Programme will be revisited in 2025.
- Under Article 6, Pakistan contributed to resolving long-standing carbon market negotiations by supporting flexible reporting for developing countries and safeguarding national authorization of carbon credits, helping achieve consensus on transparent market rules.
- In adaptation discussions, Pakistan supported integrating finance into the Global Goal on Adaptation, contributing to the decision to develop adaptation indicators and launch the Baku Adaptation Road Map.
- On Loss and Damage, Pakistan highlighted the severe impacts of climate disasters and supported the operationalization of the Loss and Damage Fund.
- COP29 achieved a breakthrough with the Fund becoming fully operational, with initial pledges exceeding USD 730 million and expected to begin financing in 2025



Third National Communication (TNC) and First Biennial Transparency Report (BTR) to the UNFCCC:

- Building on earlier reporting cycles and a continued commitment to climate action, Pakistan successfully prepared and submitted its Third National Communication (TNC) and First Biennial Transparency Report (BTR) to the UNFCCC. The process was led by the Ministry of Climate Change and Environmental Coordination through a coordinated national mechanism. The International Cooperation Wing and the COP Cell ensured effective inter-institutional coordination and compliance with UNFCCC reporting requirements and the Enhanced Transparency Framework.
- The reports present a credible national greenhouse gas profile. Total emissions were 489 MtCO_{2e} in 2018 and 521 MtCO_{2e} in 2021. The energy sector remained the largest source of emissions, followed by agriculture, IPPU, and waste.
- Both reports were finalized and submitted within the prescribed timelines. The exercise strengthened national transparency systems, improved institutional ownership, and reaffirmed Pakistan's sustained commitment under the Convention and the Paris Agreement.

C. Chemical Section:



- From 1st July 2024 to 30th June 2025, 13 environmental permits (NOCs) were granted for import of recyclable waste under provisions of the Import Policy Order 2022 and Basel Convention.
- An online portal was developed for hosting of NOC-related data smooth processing of applications in collaboration with Environmental Protection Departments.
- A **comprehensive application** was submitted to the European Union under the **EU Waste Shipments Regulation** to allow the import of recyclable waste into Pakistan. This extensive process involved the collection and compilation of national data on waste recycling, registration of recyclers, and online publication of registered recyclers' lists on the respective provincial Environmental Protection Agencies' websites.
- Initiated process for banning of hazardous chemicals e.g. chloroform and polyol.
- Under the Prior Informed Consent Procedure of Basel and Rotterdam Conventions, import permissions after due diligence were issued to 35 importers/recyclers.
- Supervised the implementation of WB-funded Plastic Free Rivers and Seas for South Asia (PLEASE) Project.



Successful negotiation participation in Intergovernmental Negotiating Committee (INC) on Plastic Pollution.

- **National Integrated Chemical Management and Safety Framework** was drafted in 2025 under a UNEP-funded Special Programme project. Under the same project, an adoption plan for the **Globally Harmonized System of Classification and Labelling of Chemicals (GHS)** was also developed. In addition, eight (08) training sessions, expert committee meetings, and stakeholder engagement workshops on sound management of chemicals and hazardous waste were conducted during 2025.
- The **Chemical Section** is currently implementing another UNEP-supported project focusing on **chemicals of concern in the textile sector**. Under this project, seven (07) meetings and workshops were organized to engage textile mills and regulatory authorities in support of the project's intended outputs. The Section also secured a **GEF-funded project** addressing mercury use in **artisanal and small-scale gold mining (ASGM)** under the **Minamata Convention**.
- In addition, proposals and funding applications were submitted to UNEP and other donor agencies during 2024-25 for projects in following areas:

- Environmentally sound ship recycling industry (USD 12 Million)
- Phase out PCBs from energy sector under global PCB elimination program of USD 206.8 million
- Updating National Implementation Plan for new POPs under Stockholm Convention (USD 285,000)
- Phasing out mercury from skin lightening products (USD 1 million)
- Global Elimination of Mercury in Non-ferrous Metals Initiative (USD 4 million)
- Capacity building on plastic waste management in Pakistan (USD 115,000)



D. National Ozone Unit:



The National Ozone Unit's major activities and achievements during the year-2024-25 are as follows: -

- i. Collected HCFCs import data on the monthly basis from FBR and importers to monitor the import of HCFCs in the country and correlating with the allowed quota quantities.
- ii. NOU through multiple RAC technicians training programmes trained 201 technicians on Good Servicing Practices for the Servicing Technicians in RAC Sector during July 2024 to June 2025.
- iii. NOU signed an MOU with Sindh Board of Technical Education (SBTE) regarding certification of 125 Refrigeration and Air Conditioning (RAC) technicians of HVAC Level-02 under Recognition of Prior Learning (RPL) skills.
- iv. NOU in collaboration with UNIDO and UNEP (implementing agencies of HPMP) prepared and submitted the Tranche-II of the HPMP stage-III at the 95th Ex. Com meeting that was held in December, 2024.
- v. NOU initiated the process of introducing ban of pre-mixed Polyol with HCFC-141b as per the decision of 90th ECC and the Ban was announced w.e.f. January 31, 2025.
- vi. NOU worked with Pakistan Single Window team on linking the import related matters pertaining to import and management of HCFCs by NOU, MoCC&EC. Drafted Business Requirement Specifications in collaboration with PSW team.

- vii. NOU completed 01 HCFC 141-b conversion project in pipe insulation sector in May, 2025. The completion enabled Pakistan to phase out HCFC-141b from the manufacturing of pipe insulation at M/s Islam Ud and Sons, Karachi.
- viii. Organized 02 days training of Customs officers from 16-17 January, 2025 in Quetta on required Montreal Protocol implementation and HCFCs controls. Trained 40 Customs and Enforcement officers.
- ix. Collected, analyzed and submitted Data for Article 7 Report and Country Programme Reports for 2024 well on time to ensure compliance status of Pakistan. To Check the compliance, data was collected from both available sources i.e. FBR and importers. Data provided by the FBR and importers was examined in detail for the illegal / excess status clearance and accordingly the details were submitted to the NPD, MoCC&EC.
- x. HCFCs import quota review meetings were arranged by NOU at Karachi and Lahore during 2024 and 2025. MP/NOU improved its presence in field by visiting warehousing facilities/operational offices of quota holders which resulted in significant improvements with regards to handling of HCFCs and awareness of dealing with flammable refrigerants.
- xi. Organized thermobaric sector foam manufacturing industries test and trials with the UNIDO's International Foam Expert Mr. Risto Ojala from 04 - 08 May, 2025 at Karachi. The test and trials at the thermobaric sector remained focused on physical test and trials of the newly procured raw material by UNIDO.
- xii. Effective compliance of ODS phase out ensured and reduction targets of the HCFC phase out on 1st January 2025 met and accordingly indicated in HCFC quota 2025.
- xiii. The process for ratification of Kigali Amendment was initiated and various meetings were held prior to submitting case for ratification to the Federal Cabinet.
- xiv. In order to phase out the ODSs from the thermoware, PU sandwich panel, spray foam and air conditioning industries; NOU along with relevant implementing agencies is implementing HPMP Stage- III.

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2.4. Climate Finance Wing:

Carbon Markets Section:

The Carbon Markets Section, established under the Climate Finance Wing of the Ministry, is responsible for managing all carbon market-related activities. Its core functions include working for an enabling ecosystem for carbon trading, processing cases of carbon credit projects under Article 6, and ensuring alignment with Pakistan's Policy Guidelines for Trading in Carbon Markets.

Goals and target of the section are to process Letters of Intent to support development of a pipeline of compliance market projects, as well as to issue Host Country Approvals for Clean Development Mechanism's projects transition. It also aims to issue authorizations under Article 6 of Paris Agreement subject to the fulfilment of codal formalities and compliance with rules. Other goals of the section are: development of national carbon registry, carbon market dashboard, signing G2G agreements under Article 6.2 of the Paris Agreement, and capacity building of private and public sector on carbon markets.

The details of activities, achievements and progress of Carbon Markets section during the preceding financial year are as under:

- In December 2024, Pakistan Policy Guidelines for Trading in Carbon Markets were approved by the Federal Cabinet and were notified on 3rd January 2025.
- Carbon Market Rules were drafted and uploaded on the Ministry's website for public consultation and are expected to be finalized.
- G2G agreements are being pursued with South Korea and Norway.
- Three projects were issued Letters of Intent under Article 6.2 of the Paris Agreement and one project was issued to Host Country Approval under Article 6.4 of the Paris Agreement.
- Cases of Clean Development Mechanism (CDM)'s projects transition to Article.
- Work on development of national carbon registry and carbon market dashboard is being pursued.

Green Finance Section:

The Green Finance Section, established under the Climate Finance Wing of the Ministry, is responsible for leveraging climate finance for the country. Its core functions include working in close liaison with the national and international financial and development entities for inviting investment for climate related viable projects. A vigilant and consistent coordination with GCF, GEF, FAO, ADB, MoF, EAD, MoPD&SI and relevant Provincial departments is the core business of the section. Goals and target of the section are to engage International Financial Entities for investments and grants based finance for the climate related projects, TAs and readiness. This Section ensures to fulfil the commitments made regarding climate resilience activities under ADB and IMF.

The details of activities, achievements and progress of Green Finance section during the preceding financial year are as under:

- In 2024-2025, Pakistan Green Taxonomy was finalized and approved by the Federal Cabinet.
- Request for Support from Global Shield was submitted.
- Commenced with the development of draft National Climate Finance Strategy (NCFS) which is in the pipeline.
- Complying the commitments made under with ADB and IMF in close coordination with relevant ministries and departments.
- Pitched projects to leverage climate finance on multiple national and international fora.
- Signed MoU with the University of Cambridge and arranged two online trainings for 150 public and private sector officials.
- Conducted Climate Finance Roundtable Conference in BAKU during COP29 wherein the Prime Minister of Pakistan chaired the event and 11 heads of different states participated.

3. ATTACHED DEPARTMENTS AND AUTONOMOUS BODIES

3.1. Pakistan Environmental Protection Agency (PAK-EPA)

A. Introduction

The Pakistan Environmental Protection Agency (Pak-EPA) is a Federal institution responsible for the protection, conservation, rehabilitation, and improvement of the environment in Pakistan. Established under the Pakistan Environmental Protection Act, 1997 (PEPA 1997), Pak-EPA functions as the principal regulatory and coordinating authority at the national level to

ensure sustainable development while safeguarding public health, natural resources, and ecological integrity. The Agency operates under the administrative control of the Ministry of Climate Change and Environmental Coordination and acts as the Federal Agency for the purposes of implementation of environmental laws, policies, and international environmental commitments.

Pak-EPA plays a pivotal role in giving effect to the constitutional mandate enshrined in Article 9 and Article 9-A of the Constitution of the Islamic Republic of Pakistan, which recognize the right to life and the right to a clean, healthy, and sustainable environment as fundamental rights of every citizen. In this context, the Agency serves as a guardian of environmental rights, ensuring that development activities are undertaken in a manner that does not compromise environmental quality or inter-generational equity. The jurisprudence of the superior courts has consistently reinforced the importance of a strong and independent environmental regulator, thereby underscoring the critical institutional role of Pak-EPA.

One of the core functions of Pak-EPA is the formulation, revision, and enforcement of National Environmental Quality Standards (NEQS) for ambient air, water, wastewater, noise, and land. These standards provide the legal and technical benchmarks for pollution control across all sectors of the economy, including industry, energy, transport, construction, and municipal services. Pak-EPA ensures compliance with NEQS through monitoring, inspections, environmental sampling, and enforcement actions, thereby contributing directly to pollution abatement and improved environmental governance at the national level.

Pak-EPA is also the statutory authority responsible for the administration of the environmental impact assessment regime. Under Section 12 of PEPA 1997, no project may commence construction or operation unless an Initial Environmental Examination (IEE) or





Environmental Impact Assessment (EIA), as applicable, has been duly reviewed and approved by the Federal Agency. Through this preventive regulatory mechanism, Pak-EPA integrates environmental considerations into development planning, mitigates adverse environmental impacts, and promotes environmentally sound decision-making. This function is particularly significant for large-scale infrastructure, energy, industrial, and transboundary projects falling within the federal domain.

Furthermore, Pak-EPA undertakes public awareness, capacity building, and stakeholder engagement initiatives aimed at fostering environmental stewardship and compliance culture. By promoting environmental education, transparency, and public participation, the Agency strengthens democratic

environmental governance and enhances accountability in environmental decision-making processes.

In view of its statutory mandate, constitutional relevance, technical expertise, and international obligations, Pak-EPA remains an indispensable Federal institution. Its continued existence and strengthening are essential for effective environmental regulation, sustainable economic development, and the protection of fundamental environmental rights in Pakistan.

B. FUNCTIONS OF PAKISTAN ENVIRONMENTAL PROTECTION AGENCY (PAK-EPA)

Under Section 6 of the Pakistan Environmental Protection Act, 1997, the Pakistan Environmental Protection Agency (Pak-EPA) performs the following key functions:

1. Implementation and Enforcement of Environmental Law

- ✓ Implement, administer, and enforce the provisions of PEPA 1997, rules, and regulations made thereunder.
- ✓ Take necessary enforcement actions, including inspections, monitoring, issuance of notices, and initiation of legal proceedings against violators.

2. Formulation and Enforcement of National Environmental Quality Standards (NEQS)

- ✓ Prepare, revise, and establish National Environmental Quality Standards for ambient air, water, wastewater, noise, and land, with approval of the Pakistan Environmental Protection Council.
- ✓ Ensure nationwide enforcement of NEQS and compliance by public and private sector entities.

3. Environmental Impact Assessment (IEE/EIA)

- ✓ Review and approve Initial Environmental Examinations (IEEs) and Environmental Impact Assessments (EIAs) for projects falling within the federal jurisdiction.
- ✓ Ensure that no project commences construction or operation without environmental approval, as mandated under Section 12 of PEPA 1997.
- ✓ Monitor compliance with conditions of environmental approvals.



4. Environmental Monitoring and Pollution Control

- ✓ Establish and operate systems for environmental monitoring and surveillance.
- ✓ Conduct sampling, testing, and analysis of air, water, soil, and emissions to control pollution and environmental degradation.
- ✓ Identify sources of pollution and recommend corrective measures.

5. Regulation of Hazardous Substances and Wastes

- ✓ Regulate the import, export, manufacture, storage, handling, transportation, and disposal of hazardous substances and wastes.
- ✓ Enforce international obligations relating to hazardous chemicals and wastes, including transboundary movement.

6. Environmental Research, Data Collection, and Reporting

- ✓ Collect, compile, and publish environmental data and indicators.
- ✓ Conduct or commission environmental research and studies.
- ✓ Prepare national environmental reports and state-of-the-environment assessments.

7. Policy Advice and Support to Government

- ✓ Advise the Federal Government and the Pakistan Environmental Protection Council on environmental policies, legislation, and strategies.
- ✓ Assist in the integration of environmental considerations into national development planning.



8. International Environmental Obligations

- ✓ Act as national focal point or coordinating agency for Multilateral Environmental Agreements (MEAs).

- ✓ Represent Pakistan in international and regional environmental forums.

- ✓ Facilitate implementation of international environmental conventions and protocols.

9. Public Awareness, Education, and Participation

- ✓ Promote environmental awareness and education among the public.
- ✓ Facilitate public participation in environmental decision-making processes, particularly in the EIA process.

10. Environmental Audits and Compliance Evaluation

- ✓ Carry out environmental audits and compliance assessments of projects and industrial activities.
- ✓ Recommend remedial and corrective actions for non-compliance.

11. Advisory and Technical Assistance

- ✓ Provide technical assistance to public and private sector organizations on environmental management and compliance.
- ✓ Develop guidelines, codes of practice, and sectoral standards.

12. Protection and Conservation of Environment

- ✓ Take measures for the protection, conservation, rehabilitation, and improvement of the environment.
- ✓ Address issues related to air pollution, water pollution, noise pollution, land degradation, and ecosystem protection.

C. GOALS AND TARGETS

1: Strengthen Environmental Governance and Rule of Law

Targets:

- ✓ Achieve full enforcement of the Pakistan Environmental Protection Act, 1997 and subordinate legislation across federal jurisdictions.

- ✓ Increase compliance rate with environmental laws and regulations among regulated entities.
- ✓ Reduce environmental violations through timely inspections, notices, and legal actions.

2: Prevent and Control Pollution through Effective Standards

Targets:

- ✓ Periodically review and update National Environmental Quality Standards (NEQS) in line with scientific evidence and international best practices.
- ✓ Ensure progressive compliance with NEQS by industrial, municipal, and infrastructure sectors.
- ✓ Reduce emissions and effluents exceeding permissible limits in federally regulated sectors.

3: Ensure Environmentally Sound Development through IEE/EIA

Targets:

- ✓ Ensure that 100% of federally governed projects obtain IEE/EIA approval prior to commencement.
- ✓ Improve the quality, timeliness, and transparency of EIA review processes.
- ✓ Ensure effective post-approval monitoring and compliance with environmental management plans.

4: Protect Public Health and Environmental Rights

Targets:

- ✓ Minimize environmental risks to human health arising from air, water, noise, and land pollution.
- ✓ Address environmental issues impacting vulnerable and marginalized communities.
- ✓ Support enforcement of the constitutional right to a clean, healthy, and sustainable environment.

5: Strengthen Environmental Monitoring and Data Systems

Targets:

- ✓ Establish and operationalize robust national environmental monitoring systems.
- ✓ Improve availability, accuracy, and accessibility of environmental data.

- ✓ Publish regular State of the Environment and sector-specific environmental reports.

6: Regulate Hazardous Substances and Wastes

Targets:

- ✓ Ensure effective control over hazardous chemicals, waste, and transboundary movements.
- ✓ Achieve compliance with international conventions on hazardous substances and waste management.
- ✓ Reduce environmental and health risks associated with improper handling and disposal of hazardous materials.



7: Promote Environmental Awareness and Public Participation

Targets:

- ✓ Increase public awareness of environmental rights and responsibilities.
- ✓ Strengthen stakeholder participation in EIA and environmental decision-making processes.
- ✓ Improve transparency and access to environmental information.

8: Build Institutional and Technical Capacity

Targets:

- ✓ Enhance technical, legal, and enforcement capacity of Pak-EPA staff.
- ✓ Modernize laboratories, monitoring equipment, and digital systems.
- ✓ Introduce performance-based management and accountability frameworks.

D. ACTIVITIES

1. EIA/MONT SECTION

- ✓ During the financial year 2024-25, three (03) Initial Environmental Examination Report (IEE) cases were filed at Pak-EPA. Two (02) IEE cases were rejected. The rest of one (01) project of IEE has been approved.
- ✓ During the financial year 2024-25, twenty (20) Environmental Impact Assessment (EIA) cases were filed at Pak-EPA. Three (03) EIA case were rejected. Sixteen (16) EIA cases were accorded environmental approval whereas the rest of one (01) case remained under process of review; they could not be decided on account of either non-submission of responses or late submission of responses on part of the proponent thereby causing delay in cases' decision.
- ✓ During the financial year 2024-25, Ten (10) CNG/Petrol Pump cases were filed at Pak-EPA. No Petrol Pump case was rejected. Ten (10) Petrol Pump cases were accorded environmental approval.
- ✓ During the financial year 2024 -25, Public Hearings of eighteen (18) EIA cases were successfully conducted.

2. LAB/NEQS SECTION

Environmental Monitoring & Laboratory Services

- ✓ Conduct water quality analysis (surface water, filtration plants, wastewater, private entities).
- ✓ Perform microbiological testing for Coliform and E. coli.
- ✓ Monitor ambient air quality and publish daily updates on official platforms.
- ✓ Conduct noise pollution monitoring across Islamabad.
- ✓ Run vehicular emission testing operations and assist enforcement teams.



Enforcement & Regulatory Responsibilities

- ✓ Implement Pakistan Environmental Protection Act (PEPA) 1997.
- ✓ Evaluate IEE/EIA reports and carry out post-approval monitoring of EMPs.
- ✓ Issue Environmental Laboratory Certificates in ICT.
- ✓ Execute inspections, field investigations, issuance of warnings, challans, and enforcement orders.
- ✓ Regulate and enforce Single-Use Plastics (Prohibition) Regulations, 2023.

Research, Training & Academic Support

- ✓ Host 80+ interns through structured 6-week internship programs.
- ✓ Support more than 250 student research projects from FJWU, IIUI, QAU, AIOU, and others.
- ✓ Provide environmental data and laboratory support for academic research.

Public Guidance & Community Engagement

- ✓ Address public complaints (tree cutting, industrial pollution, wastewater overflow, air emissions).
- ✓ Conduct awareness events, clean-up drives, climate walks, plantation drives.
- ✓ Publish the first-ever Pak-EPA biannual newsletter.

Water Quality Analysis

- ✓ A total of 390 samples analyzed:
- ✓ 50 surface waters
- ✓ 37 public filtration plants
- ✓ 25 wastewaters
- ✓ 28 private entities
- ✓ 50 samples through CDA/WASA
- ✓ Physio-chemical testing included pH, DO, BOD, COD, nutrients, and heavy metals; microbiological testing included Coliform and E. coli.

Ambient Air Quality Monitoring

- ✓ Daily ambient air data posted online.
- ✓ Samplers installed at 21 locations across Islamabad.
- ✓ Trend analysis conducted for PM_{2.5}, NO₂, and O₃ (Jan–June 2025).

Vehicular Emission Testing (Jan–June 2025)

- ✓ 320 vehicles tested by EMT.
- ✓ Additional 744 vehicles tested with Islamabad Police.
- ✓ Emissions measured for CO and other pollutants.

Noise Monitoring

- ✓ Noise pollution study conducted across residential, commercial, industrial, and silence zones.
- ✓ Compliance was mixed based on NEQS thresholds.

Hospital Waste Management

- ✓ Sixteen (16) hospital inspections to ensure compliance with waste management rules.



- ✓ 4.7 Single-Use Plastics Enforcement (Jan–June 2025)
- ✓ Seventy Seven (77) warnings, Fifteen 15 challans (worth PKR 135,000/-).
- ✓ 825 kg plastic confiscated from markets including Centaurus, G-9, I-8, G-8, and Itwar Bazar.

Research, Internships & University Collaboration

- ✓ 80+ interns trained (six-week rotation).
- ✓ 250+ research projects supported.
- ✓ Visits from NIM, AHKNCRD, Turkish delegations, and various universities.

Environmental Events & Public Outreach

- ✓ QAU Climate Walk & Cycling Event.
- ✓ Two-day Margalla Trail-5 Clean-up Drive.
- ✓ Plantation drives at QAU.
- ✓ IBC training sessions, Qiraat competition, and awareness campaigns.

3. LEGAL/ENFORCEMENT SECTION

The following enforcement actions were taken by Pak-EPA during 2024 and 2025, reflecting inspections, legal proceedings, penalties, and regulatory compliance work:

S.No	Title	2024	2025	Total
1	Notices Issued	96	109	205
2	Environmental Protection Orders (EPOs)	22	18	40
3	Plastic Bag Fine	Rs. 10,000	Rs. 10,000	Rs. 20,000
4	Administrative Penalties	Rs. 4,000,000	Rs. 3,000,000	Rs. 7,000,000
5	Penalties/Fines by Environmental Protection Tribunal (EPT)	Rs. 201,305,000	Rs. 70,600,000	Rs. 271,905,000
6	EPT Complaints	15	8	23
7	High Court Cases	8	0	8
8	Supreme Court Cases	5	0	5
9	Civil / Magistrate Court / Ombudsman / NCHR	3	1	4
10	Public Information Complaints (PIC)	3	1	4
11	Court Visits	115	70	185
12	Enforcement Visits	86	40	126
13	Miscellaneous	0	0	0

E. ACHIEVEMENTS

- ✓ A total of 205 enforcement notices were issued during 2024–2025.
- ✓ 40 EPOs were processed, ensuring regulatory compliance across sectors.
- ✓ Administrative penalties totaling Rs. 7 million were imposed for environmental violations.
- ✓ The Environmental Protection Tribunal (EPT) imposed penalties amounting to Rs. 271.9 million, demonstrating strong legal action against polluters.
- ✓ 185 court visits and 126 enforcement visits were conducted, resulting in strengthened on-ground enforcement.
- ✓ Cases were actively pursued in the High Court (8 cases), Supreme Court (5 cases), and Civil/Magistrate/Ombudsman forums (4 cases).
- ✓ Enforcement actions resulted in Rs. 20,000 in fines related to plastic bag violations in addition to challans recorded earlier.
- ✓ Complaint handling remained robust with 23 EPT complaints, 4 PIC complaints, and multiple field investigations.
- ✓ This performance reflects Pak-EPA's strong enforcement posture and institutional efficiency in addressing pollution, non-compliance, and legal obligations.
- ✓ Successfully completed 390 water analyses, identifying key issues such as microbial contamination and chemical exceedances.
- ✓ Expanded ambient air quality monitoring with daily reporting and multiple monitoring sites.
- ✓ Conducted city-wide vehicular emissions testing covering over 1,000 vehicles.
- ✓ Strengthened actions under PEPA 1997 through inspections, challans, court proceedings, and notices.
- ✓ Major progress under the Single-Use Plastic Prohibition Regulation with 825 kg plastic confiscated.
- ✓ Improved oversight of hospital waste by completing 16 inspections.
- ✓ Supported 250+ university researchers across multiple disciplines.
- ✓ The internship program contributed significantly to capacity building for environmental students.

- ✓ Enhanced environmental knowledge-sharing through official newsletters and training sessions.
- ✓ Introduction of Smoke Density Reduction (SDR) device, reducing smoke emissions from brick kilns by 70–90% and fuel use by 40%.
- ✓ Large-scale clean-up, awareness drives, workshops, and university events.
- ✓ First-ever Pak-EPA Newsletter published, improving transparency and outreach.

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3.2. Zoological Survey of Pakistan (ZSP)

The **Zoological Survey of Pakistan (ZSP)** is a key federal agency and an advisory body to the Government of Pakistan in wildlife conservation policymaking. The mandate of ZSP is to monitor the status, distribution, and threats to wildlife in Pakistan. In addition to these objectives, ZSP is also responsible for maintaining standard zoological collections for reference from different parts of the country, imparting education, and raising awareness among the masses for biodiversity conservation.

ROLE & FUNCTIONS:

The Zoological Survey of Pakistan (ZSP) is committed to wildlife research, conservation, and policy support. Its key objectives are:

- To assess the distribution, population dynamics, and conservation status of Pakistan's animal life.
- To conduct scientific research on the ecology and biology of wildlife.
- To establish and maintain standard zoological collections for reference and study.
- To provide expert advice to the government on zoological matters, including conservation, management, and sustainable wildlife trade.
- To offer training programs and promote public awareness for wildlife conservation.

TARGETS, ACTIVITIES & ACHIEVEMENTS

The details of targets, activities and achievements for the current Fiscal Year 2023-24 areas follows:

1. Baseline Faunal studies

Pakistan recognizes the significance of its rare and threatened wildlife species, designating their habitats as **National Parks, Wildlife Sanctuaries, and Game Reserves**. Conducting baseline surveys in these protected areas is essential for assessing and monitoring biodiversity.

1.1 Survey for Baseline Floral and Faunal Studies of Zoo-Cum Botanical Garden Banigala Islamabad.

During financial year 2024-25, a baseline study was conducted in the area of Zoo-cum Botanical Garden Islamabad, to explore its flora and fauna.

Activities

During the fieldwork, various survey methods such as **Transect lines** and **point Count** method were used to study the ecology and diversity of the area. The observations included areas with dense vegetation, mountain and water bodies. The field visits spanned multiple areas within the Zoo-cum Botanical Garden, focusing on the conservation value of the site and gathering comprehensive data for future floral and faunal conservation initiatives.

Floral Studies

Plants are the main source of phyto-medicine which have proved to be effective, safe, inexpensive and culturally acceptable. The local community is dependent on plant resources for their health care, fodder, fuel-wood, food and wood.

The survey recorded 129 plant species belonging to 114 genera and 50 families, with 103 species (approximately 81.7%) having known medicinal uses. The flora also supports various economic functions, including fodder, fuelwood, wild edibles, and industrial raw materials. The study identified invasive alien species, particularly *Parthenium hysterophorus* and *Lantana camara*, which pose significant ecological threats to native biodiversity. Due to unsustainable utilization, overgrazing, and spread of alien invasive species in the ZCBG, several important species are, at risk of, locally endangered.



(A view of Zoo-cum Botanical Garden Islamabad)

Faunal Studies

The study revealed that Zoo Cum Botanical Garden (ZCBG) is known to support a diverse assemblage of wildlife fauna, including several avian, reptilian and mammalian species. These include 18 species of mammals, 102 species of birds, 16 species of reptiles and 5 species of amphibians.

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(Grey Partridges *Francolinus francolinus*)

2. Target: Asian Water birds Census (AWC)

The **Asian Water Bird Census (AWC)** is conducted annually across **Asia** to monitor migratory water bird populations, with the collaboration of local wildlife departments and stakeholders. In line with this, the **Zoological Survey of Pakistan (ZSP)** has been carrying out the Mid-Winter Water birds Census including Waterfowls, every year since 1982, during the second week of January. The primary objective of these surveys is to estimate and monitor migratory water bird populations annually and analyze their population trends across various wetlands during the winter (non-breeding) season. Pakistan, as a signatory to the three Rio Conventions-**CITES** (Convention on International Trade in Endangered Species of Wild Fauna and Flora), **CMS** (Convention on Migratory Species), and the Ramsar Convention-is obligated to protect both migratory and resident fauna, along with their habitats.

These surveys also play a crucial role in **waterfowl conservation** by raising awareness and fostering interest among local communities regarding migratory birds and wetland ecosystems. Additionally, the collected data provide valuable insights into population declines, their causes, and necessary management actions at both the **local** and **flyway** levels.

Activities:

Field surveys were conducted at globally protected **Ramsar sites** and other significant wetlands across the country to estimate the populations of water birds, particularly migratory waterfowl. The **point count method** was applied at each wetland to ensure accurate population assessments. Additionally, community meetings were organized to raise awareness among local populations about the ecological importance of migratory water birds and wetland conservation.

During FY 2024-25, selected wetlands in **Khyber Pakhtunkhwa, Punjab, Sindh** and **AJK** were surveyed as part of the water bird's census.

2.1 Khyber Pakhtunkhwa (KPK):

Tarbela and Khanpur Dams:

The Zoological Survey of Pakistan conducted a preliminary survey in October 2024 at the **Tarbela and Khanpur dams** to study migratory bird migration.

Activity:

The survey team conducted observations along various shores of **Tarbela and Khanpur Dams**, focusing on **waterfowl and wader populations**. At **Tarbela Dam**, **twenty one waterbird species** were recorded, including notable migratory species such as the **Common Teal (*Anas crecca*)** and **Common Pochard (*Aythya ferina*)**, with an estimated population of **465 individuals**.

In contrast, **Khanpur Dam** yielded only **thirteen species**, with **no migratory birds observed**. This absence is likely due to **high levels of human activities, habitat disturbance, and water-based recreational activities**, which may have frightened migratory species from using the site as a stopover. The findings emphasize the **importance of habitat management and conservation measures** to mitigate human-induced pressures and enhance the ecological value of these wetlands for waterbird populations.

Achievement:

The survey identified **Tarbela Dam** as a vital habitat for migratory waterfowl, with 1138 birds observed, including **Common Teal** (*Anas crecca*) and **Common Pochard** (*Aythya ferina*). The study also highlighted the negative impact of human activities on bird populations at Khanpur Dam.



(Duck species at Tarbela Dam)

2.2. Punjab Province:

As part of the Midwinter Water bird Census 2024-25, various wetlands in Punjab were surveyed to assess water bird populations. The surveyed sites included **Kallar Kahar Lake**, **Namal Lake**, **Chashma**, **Jinnah**, and **Rasool Barrages**, as well as the **Uchhali Wetlands Complex** (Jhaller, Khabbeki, Uchhali, and Ahmadabad Lakes). Additionally, **Head Maralla**, and **Head Qadirabad**, were also covered in the census.

A total of **50** species of both migratory and resident water birds were recorded, with a total count of (N= **64030**) individuals. Among these, **13** species belonged to the family **Anatidae**

(ducks). The highest number of birds was recorded at **Uchhali Lake (22,988)** followed by **Chashma Barrage (15,253)**, followed by and **Rasool Barrage (11,589)**. Other notable counts included **Head Maralla (4001)**, **Khabbeki Lake (3214)**, **Kallar Kahar Lake (2816)**, **Namal Lake (1946)**, **Jinnah Barrage (1705)**, **Jhaller Lake (328)** and **Head Qadirabad**.



(Common Pochard *Aythya ferina* at Jhaller lake)

2.3. Sindh Province:

The Mid-waterfowl census in Sindh Province covered **Nareri Lake, Haleji Lake, Keenjhar Lake, Hudero Lake, Manchar Lake, Hammal Lake, Langh Lake, Drigh Lake, Phoosna, Charri Lakes, Ranpur Dam, Bodesar Dam, Kajrasar, Sakkra, Narysar Dams, Sangha Lake, and Rann of Kutch**.

A total of **128979** water birds belonging to **91 species** of both migratory and resident birds were recorded. Manchar Lake had the highest bird population with **25309 individuals**, followed by **Nareri Lake** with 24925 birds. The **Common Teal (*Anas crecca*)** was the most abundant migratory bird, with **19986 individuals**, followed by **Common Coot (*Fulica atra*)** with 18211 individual birds.



(A Flock of Greater Flamingo (*Phoenicopterus ruber*) at Ranpur Dam District Tharparkar Sindh)

2.4. Azad & Jammu Kashmir (AJK):

Mangla Dam:

The Zoological Survey of Pakistan conducted a preliminary survey in December 2024 at the **Mangla dam**, to study water bird migration.

Activity:

The survey team conducted observations along various Points of **Mangla Dam**, focusing on **waterfowl and wader populations**. At **Mangla Dam**, **fourteen waterbird species** were recorded, including notable migratory species such as the **Common Pochard (*Aythya ferina*)** and **Gadwall (*Anas strepera*)**, with an estimated population of **617 individuals**.

The findings emphasize the **importance of habitat management and conservation measures** to mitigate human-induced pressures and enhance the ecological value of these wetlands for waterbird populations.

Achievement:

The survey identified **Mangla Dam** as a vital stopover for migratory waterfowl, with 29 bird's species of both migratory and resident observed, the **Common Teal** and **Northern Shoveller** were found dominate in number among other waterfowls. The study also highlighted the negative impact of human activities on bird populations at study site.

3. Target: Studies on Threatened Species of Wildlife

3.1 Rut season study of Kashmir Markhor in Chitral wildlife division, KPK.

During the current financial year 2024-2025, the Rut season study of Kashmir Markhor was carried out along with the teams from IUCN, WWF, PFI, PMNH and KPK Wildlife department in Chitral Gol National Park and Chitral wildlife division, KPK.

Objectives

- The aim of the studies was to record the distribution and status of the concerned species.
- Identification of the threats to species and its habitat.
- Preparation of conservation strategy for the protection, conservation and management of the species and its habitat.

Activities

Markhor Rut Season Survey was conducted using vantage point count method. To observe the maximum numbers of animals, confirm the movements, record the occurrence, number, population dynamics (age and sex data) on prescribed data sheet developed for the purpose; all the survey parties ensured early morning sighting at about 7am and early evening sighting around 4pm at the vantage points. The local field watchers also helped identifying the sex and age of Markhor.

Achievements

The surveys were conducted from 1st January to 10th 2025 in Chitral Wildlife Division especially in its two conservancies i.e. Toshi Shasha and Ghairat Goleen. The current counts revealed about 2669 number of Markhors of different age and were recorded from the two conservancies. The results of current survey show that the population of Kashmir Markhor is stable in the Chitral Wildlife Division. It is recommended that, the livestock grazing needs to control and properly monitored to eliminate any kind of source conflict and spread of disease in wild herds from the livestock. Further, the fuel wood collection by local people during rutting season should be monitored.



(Kashmir Markhor (*Capra falconeri cashmiriensis*) at Chitral Gol National Park)



(Kashmir Markhor (*Capra falconeri cashmiriensis*) at Tushi shasha Conservancy Chitral)

3.2. Survey of Punjab Urial (*Ovis vignei punjabiensis*) in the Salt Range, Punjab

During the **Financial Year 2024-25**, a survey of the **Punjab Urial (*Ovis vignei punjabiensis*)** was conducted in the Salt Range, Punjab, in collaboration with the Punjab Wildlife Department, WWF-Pakistan, and academia. The survey covered **four districts: Jhelum, Chakwal, Khushab, and Mianwali**, aiming to assess the population status, distribution, and conservation challenges of this endangered species.

Objectives

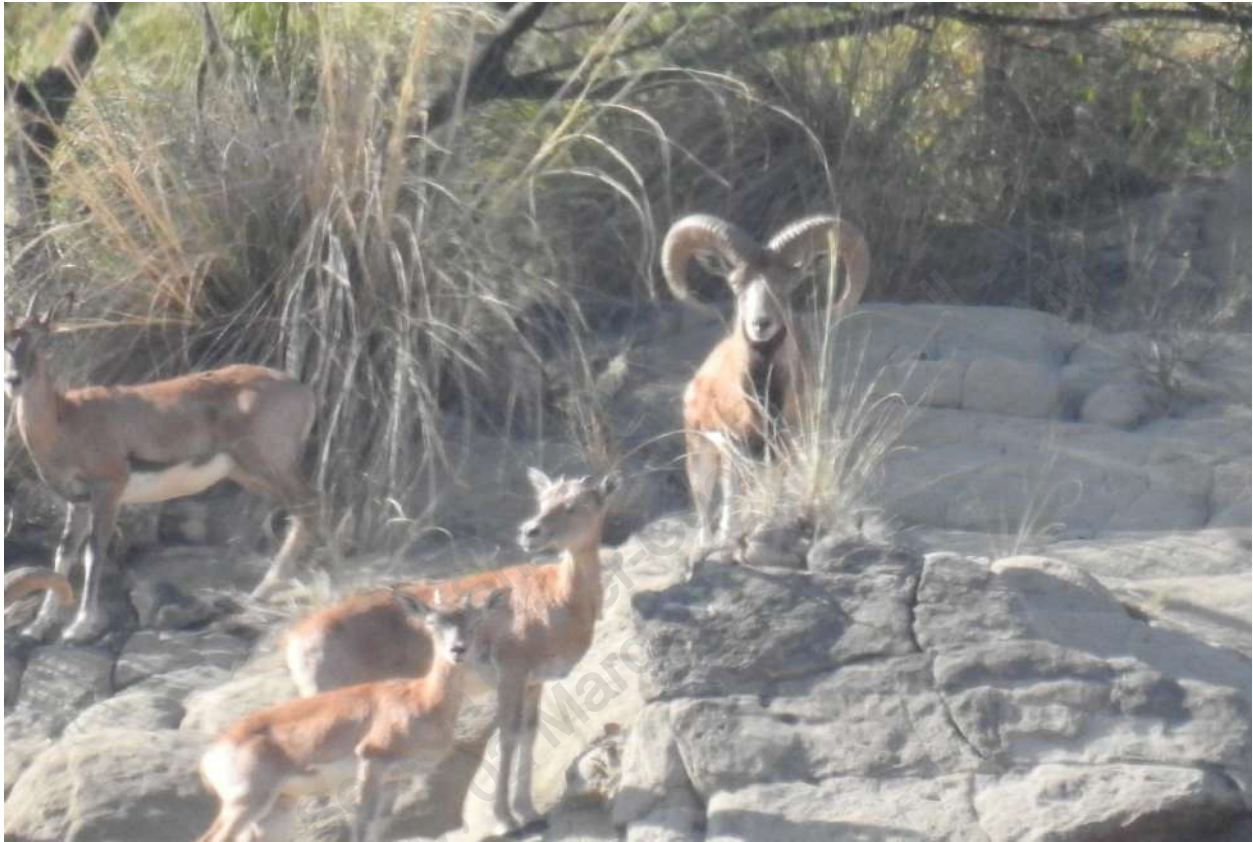
The current surveys were aimed to record the population estimates of **Punjab Urial**. To suggest measures for protection and conservation of Punjab Urial and its habitat. Further, to recommend the government for sustainable harvesting (**Trophy hunting**) of Punjab Urial.

Activities:

Field surveys for the population estimates of **Punjab Urial** (*Ovis vignei punjabiensis*) were conducted using the Line Transect Method in different habitats across the Salt Range. Transects were randomly selected to ensure a representative population estimate. **Binoculars (Olympus 8-16x40, DPS-I)** were used to observe the Urial, while GPS coordinates were marked at the start and end of each transect using a **Garmin Map 64 GPS** receiver. Data on group composition were recorded on a pre-designed form, and a **digital camera** was used to document the Urial and its habitat.

Achievements

The surveys were conducted in **October 2024** across four districts of the **Salt Range**, Punjab, including **Jhelum, Chakwal, Khushab, and Mianwali**. The current estimates revealed a total population of **1447 Punjab Urials** in the surveyed region. To ensure the **long-term conservation** of the species, it is recommended to enhance monitoring through modern communication tools, raise public awareness, and empower local communities for the protection and sustainable management of Punjab Urial populations.



(Punjab Urrial *Ovis vignai punjabiensis* at Kalabagh Salt Range)

4. Publications:

The **Zoological Survey of Pakistan (ZSP)** publishes annual survey results and research findings in its journal “**RECORDS- ISSN 0375-152X**”, to promote awareness of key wildlife species. The upcoming **Volume-25** of the journal is currently in the process of research article writing and formatting for publication

3.3. Global Change Impact Studies Centre (GCISC)

1. Introduction

The Global Climate-Change Impact Studies Centre (GCISC) was first set up in April 2002 as a development project to study climate change, its effects, and possible solutions. Later, it became a formal organization through the GCISC Act of 2013, passed by Parliament and published in the Gazette of Pakistan on March 26, 2013 (Act No. XVII of 2013), and later updated in 2023. Under this Act, GCISC functions as a corporate body managed by a Board of Governors, chaired by the Federal Minister in charge of the Ministry responsible for climate change.

The Centre is tasked with conducting scientific research on climate change at regional and sub-regional levels and assessing its effects on different sectors of socio-economic development. Its goal is to help the country prepare for and address the risks posed to water resources, agriculture, ecosystems, energy, health, and biodiversity.

2. ROLES & FUNCTIONS

GCISC, under the Act, is tasked with three functions, namely research, capacity building, outreach and awareness:

- a. **Research:** the research program is driven by national policy goals, namely protecting people against the impacts of climate change, promoting economic growth and sustainable development in a climate-constrained future, and honoring Pakistan's international commitments. To these ends, research is organized in three groups:
 - **Climatology and Environment:** using climate system models to predict future climate behavior in Pakistan, including monsoons, temperature, precipitation, and climate extremes.
 - **Water Resources and Glaciology:** using glacio-hydrological and water models to assess future behavior of glaciers, aggregate and seasonal flows in the Indus River System, and changes in the hydrological extremes across the country.
 - **Agriculture, Forestry & Land Use:** use of crop simulation models to predict the impact of projected changes in temperature, precipitation, and water availability on agriculture and food security of the country and to assess the impacts on Forestry, Land Use.

- b. **Capacity building:** imparting technical and communication skills to GCISC staff as well as students and climate scientists at other national research organizations and universities.
- c. **Dissemination of research findings:** to the scientific community, planners, policymakers, and to the public at large, in order to raise awareness of climate change among policymakers as well as the citizenry.

3. ACTIVITIES

The key research activities of the Research Sections revolve around following themes:

I. Climatology & Environment Section

The Climatology & Environment Section research areas focus on key aspects of climate variability and change, which can be summarized as follows:

- To assess historical climate trends over Pakistan and its regions;
- Climate profiling of Pakistan based on IPCC future climate scenarios (RCPs, SSPs etc.);
- To generate up-to-date information on changes in near to long term climate extremes and to study associated impacts;
- Study variations in summer monsoon patterns for impact assessments;
- High resolution climate information for future urban climate issues
- Intra seasonal to inter decadal climate predictions;
- Integrated modeling of air pollution and greenhouse gas emissions;
- Development & updating of GHG inventory of Pakistan for energy & industrial processes sectors;

II. Water Resources & Glaciology Section

- Application of advanced **hydrological, cryospheric, and AI-based models** to assess spatial and temporal variability of water availability and flows in the **Indus River System (IRS)** under updated socio-economic and climate scenarios.
- **Climate change assessment** for the **Hindukush–Karakoram–Himalaya (HKH)** region, focusing on impacts on hydrological extremes, droughts, and water resources at seasonal to sub-seasonal scales.
- **Development of drought prediction tools and adaptation strategies** aligned with national **Climate Change and Water Policies** to strengthen water security.
- **Identification of spatio-temporal climate extremes** (dry and warm phases) and their influence on **surface and groundwater** resources.
- **Dissemination of research outputs** through scientific publications, policy briefs, and media engagement.
- **Capacity building, awareness, and institutional collaboration** at national and international levels to enhance research and policy integration.

III. Agriculture, Forestry and Land Use Section

- Assess impacts of projected climate change on productivity of key agricultural crops in different climatic zones using crop models;
- Assess impacts on related areas, including productivity of forestry, grasslands, rangelands and fragile ecosystems (i.e., mountains, wetlands, coasts, and arid areas); livestock; and land degradation and deforestation, insect-pest infestation dynamics;
- Assess food security in the face of future climate change and especially under reduced availability of irrigation water;
- Devise adaptation measures, including smart agriculture;
- Studies on water, food, energy nexus;
- Updating GHG emissions from agriculture, forestry and land use and waste sectors.
- Research dissemination (International and national science journals and books, newspaper articles and policy briefs etc.)
- Capacity building and awareness raising

4. GOALS & TARGETS

Over the year, GCISC contributed significantly to the international scientific discourse on climate change and its associated impacts, while providing valuable technical inputs to a range of research initiatives. The Centre also organized a series of workshops and seminars to disseminate knowledge, foster dialogue, and enhance awareness on critical climate-related issues.

The following is a summary of the accomplishments in 2024-25:

- Publication of key research findings in scientific journals = 23
- Contribution towards technical reports = 15
- Organization of scientific activities/workshops/seminars for information dissemination and awareness = 20
- Scientific contributions/ presentations and effort on capacity building of GCISC young scientists through academic and specialized trainings and participation in online conferences, workshops etc. at International level (Nos) = 31
- Effort on capacity building of GCISC young scientists through academic and specialized trainings and participation in conferences, workshops etc at National Level (Nos) = 98
- Scientific Contributions and Presentations in National Conferences and Workshops = 61
- Provision of training to university students across Pakistan in the field of climate change through GCISC internship program = 33

- Responses to NA/Senate starred questions and provided inputs (presentations/briefs) for NA Standing Committee on Climate Change on the aspects of Climate Change = 15
- GCISC entered into several Memorandum of Understandings (MoUs) to enhance institutional collaboration, foster joint research efforts, and support the advancement of Pakistan’s climate science and policy goals.
- Muhammad Arif Goheer, Executive Director of GCISC, served as a member of the **UNFCCC Technology Executive Committee (TEC)**. He actively contributed to the preparation of key reports, policy briefs, and sub-committee activities, supporting global efforts to enhance technology development and transfer for climate change mitigation and adaptation.
- Two GCISC scientists have been selected to serve as Lead Authors for the **Seventh Assessment Cycle of the IPCC**, contributing their expertise to the development of global scientific assessments on climate change.
- Muhammad Arif Goheer, Executive Director of GCISC, served as a Member of the **Technical Expert Group (TEG)** on Environment and Development under **UNESCAP**, contributing his expertise to regional initiatives and policy discussions on sustainable development and environmental management.
- Muhammad Arif Goheer, Executive Director–GCISC: Contributed in “Science Communication & Diplomacy Series-2: Addressing Climate Change through Effective Science Communication in OIC Member Countries”; A COMSTECH Publication (ISBN: 978-969-487-025/1/2024).
- Shahbaz Mahmood, Head of Climatology & Environment at GCISC, served on the **Scientific Steering Committee of ScenarioMIP/WCRP**, contributing to the design of scenarios for **CMIP7 climate model experiments** under the **IPCC AR7**.
- GCISC remained actively engaged in UNFCCC Technical Expert Review (TER) processes in 2024–25. One scientist from the Centre served as expert reviewer for Italy’s GHG Inventory in Agriculture sector (2025), ensuring consistency with the Paris Agreement’s Modalities, Procedures and Guidelines (MPGs).
- GCISC played a key role in developing Pakistan’s **Third National Communication (TNC)**, submitted to the **UNFCCC in June 2025**. The Centre provided scientific and technical inputs, including climate data analysis, greenhouse gas inventories, and vulnerability assessments, contributing to a comprehensive national report that highlights Pakistan’s progress and challenges in addressing climate change.
- A National Greenhouse Gas (GHG) Inventory Management System has been established, ensuring the preparation of inventories on a biennial basis. Country-specific emission factors (Tier methodologies) are being developed for key sectors to enhance the accuracy and consistency of national emissions reporting.

- Operationalization of the National Measurement, Reporting, and Verification (MRV) System to ensure timely, accurate, and transparent climate data reporting in alignment with international climate transparency and compliance obligations.
- Development of a comprehensive climate change curriculum at the tertiary level to equip university students with the knowledge and skills necessary for informed climate action and policy engagement.
- The preparation and submission of Pakistan's third Nationally Determined Contributions (NDC 3.0) in fulfillment of the country's international reporting obligations under the Paris Agreement and to reaffirm its commitment to global climate action.

5. ACHIEVEMENTS & SALIENT RESEARCH FINDINGS

A) Research

CLIMATOLOGY

a. **Future climate projections for Pakistan: Insights from CMIP6 GCMs of IPCC AR6:**

The research findings of Global Climate-Change Impact Studies Centre (GCISC), as shown in Fig. 1, present a comparative analysis of annual mean temperature anomalies for Pakistan and the global average relative to the 1961–1990 baseline period. Notably, Pakistan's warming appears more pronounced and variable compared to the global trend, particularly from the late 1990s onwards, where the anomalies frequently exceed 1.0°C above the baseline.

Similarly, as per GCISC's latest research findings based on IPCC-AR6 SSP scenarios, Pakistan is likely to experience more intense warming than the global average across all future scenarios, especially under high-emission pathways as depicted in Fig 2. In the near term, Pakistan is projected to warm slightly more than the global average in all scenarios. For instance, under SSP1-2.6, Pakistan warms by 1.0°C compared to the global 0.7°C. In the long term, the warming gap between Pakistan and the globe widens significantly, particularly under high-emission pathways. Under SSP5-8.5, global temperatures are expected to rise by 4.0°C, while Pakistan could experience a much higher 5.8°C increase, highlighting Pakistan's greater climate sensitivity and regional amplification of global warming. This stark rise highlights the country's heightened vulnerability to climate change reinforcing the urgent need for aggressive mitigation globally and robust adaptation strategies nationally to protect vulnerable sectors such as water, agriculture, and public health.

Consequently, the country faces disproportionately severe climate impacts owing to its geographic location, socio-economic conditions, and dependence on climate-sensitive sectors. The communities, across the country, are increasingly exposed to a spectrum of escalating climate hazards that vary in intensity and nature by region. In the northern mountains of Gilgit-Baltistan, record-breaking summer temperatures of up to 48.5 °C in 2025 have

accelerated glacial melt, triggering unstable glacial lakes and deadly flash floods and landslides that have claimed lives, destroyed vital infrastructure, and displaced communities. In 2025, the rainfall from June 24 to July 23 was 10% to 15% heavier because of climate change, leading to many building collapses in urban and rural Pakistan. The government has reported at least 300 deaths and 1,600 damaged houses due to the floods, heavy rain and other weather during this period. On the other hand, an intense heatwave in June 2024 in Sindh claimed more than 568 lives, with hospitals in Karachi overwhelmed with heatstroke patients. Similarly, the rainfall between September 2024 and mid-January 2025 was 40% below normal, leaving parts of Sindh, Balochistan, and Punjab dry and pushing communities toward drought conditions, exacerbating water scarcity and agricultural losses. The geographic spread of these hazards, from melting glaciers in the north to lethal heatwaves in the south, and from flash floods in the highlands to prolonged droughts in the plains, underscores the country's acute exposure to climate extremes.

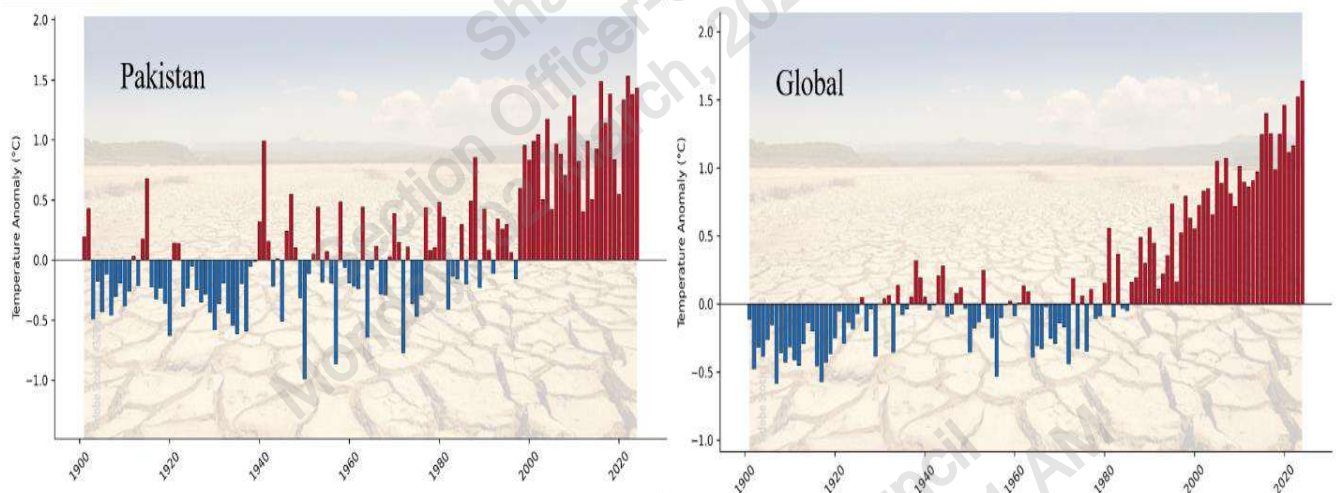


Fig. 1: Mean temperature change; Pakistan vs Global w.r.t 1961–1990 – GCISC Research

Findings.

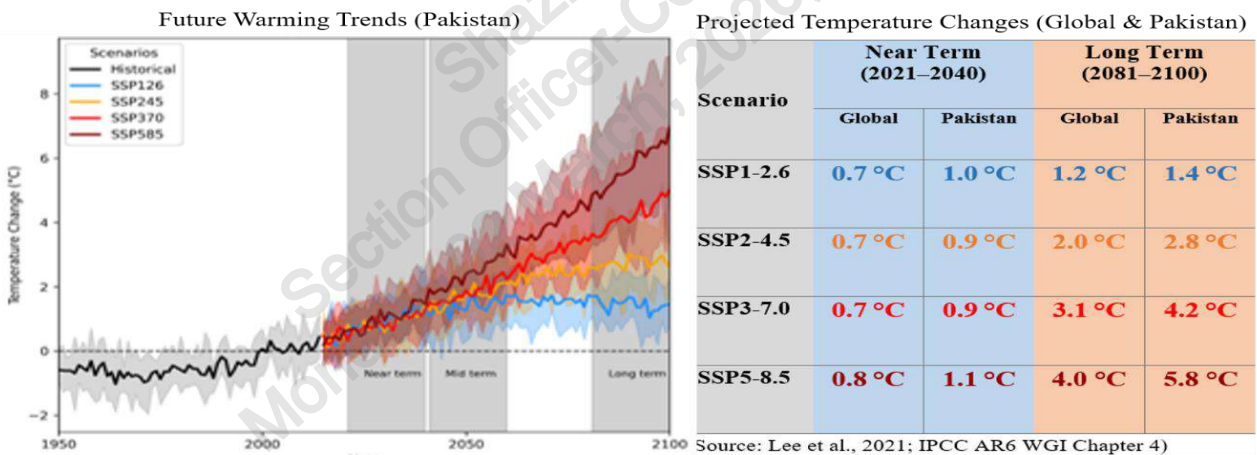


Fig. 2: 21st century climate warming trends over Pakistan (left) and comparison of projected temperature changes over Pakistan with the global changes – GCISC Research Findings.

b. The impact of tropical sea surface temperature on extreme precipitation in Pakistan during the summer of 2022:

In August 2022, Pakistan experienced an unprecedented precipitation event that caused significant damage. Analysis of the observations reveals that this extreme rainfall is primarily driven by anomalous atmospheric zonal advection, resulting in an anomalous water vapor concentration in Pakistan. The climatological meridional advection also contributes to this flooding. Anomalous easterly winds and low-level vertical convection combine to be critical factors contributing to the moisture concentration over the country (Fig. 3).

Further investigation identifies the air-sea interaction over the tropical Indian Ocean and abnormal warming over the Arabian Sea are crucial factors influencing this extreme flooding event. The concurrent occurrence of a negative Indian Ocean Dipole event and the warming sea surface temperature anomalies in the northern Arabian Sea intensifies the easterly winds over Pakistan, helping to transfer the anomalous water vapor from the remote region into Pakistan, ultimately contributing to the extreme flooding in 2022 (Fig. 4).

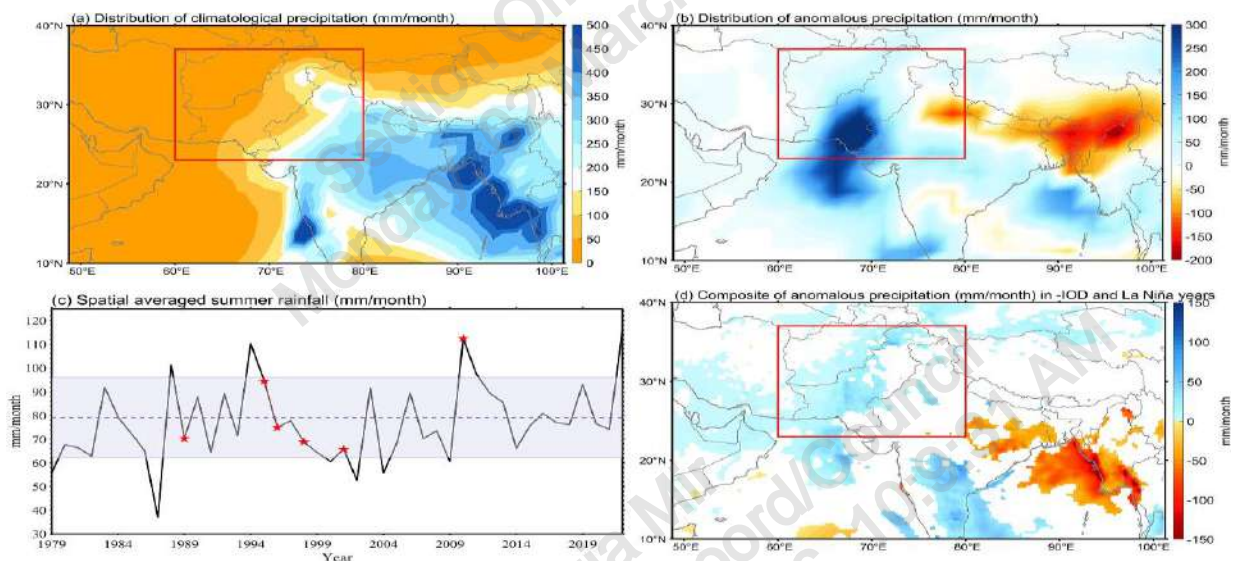
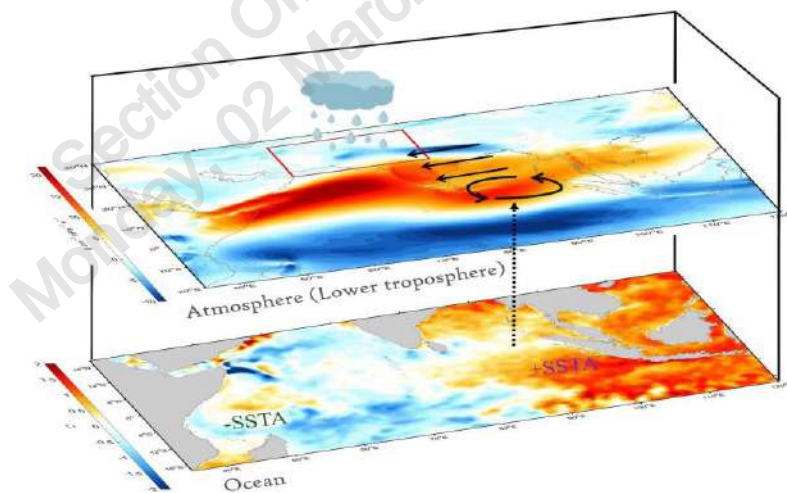


Fig. 3: (a) Climatological precipitation in August. (b) Anomalous distribution of precipitation in August 2022. The location of the red box is 23° N–37° N, 60° E–80° E. (c) Time series of averaged Pakistan rainfall in the summer season. The red points indicate the years of

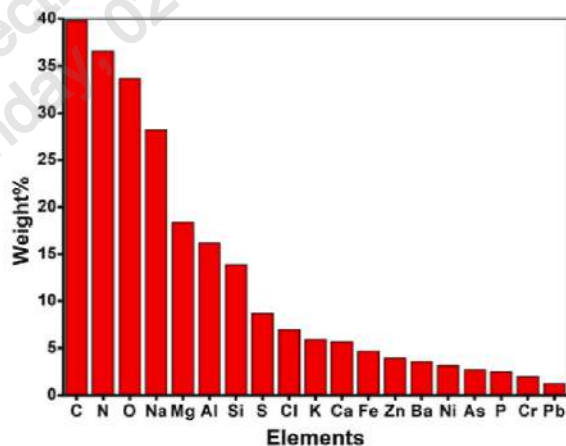


negative IOD and La Niña. (d) The composite map of precipitation anomaly in August season during LaNiña and negative IOD events.

Fig. 4: Schematic map of the mechanism responsible for the flooding in Pakistan. In the upper layer (lower troposphere), the shading indicates the water vapor transportation in August 2022 ($g \cdot cm^{-1} \cdot hPa^{-1} \cdot s^{-1}$), the red box is the study region, and the black solid vectors denote atmospheric circulation. In the bottom layer (ocean), the shading denotes SSTA in August 2022 ($^{\circ}C$), and the dashed line indicates the atmospheric circulation is stimulated with the local SSTA distribution

c. Characterization and source identification of PM_{2.5} during intense haze episodes in an urban environment of Lahore:

In the backdrop of persistent haze occurrences affecting Southeast Asia and Pakistan's environmental landscape, this study delves into an in-depth analysis of atmospheric Particulate Matter (PM_{2.5}) during intense haze episodes prevalent in Lahore throughout October, November, and December 2019. Employing advanced analytical techniques encompassing Scanning Electron Microscopy (SEM) coupled with Energy-Dispersive Spectroscopy (EDX), X-ray Diffraction (XRD), and Raman Spectroscopy (RS), this investigation meticulously scrutinized PM_{2.5} samples. The findings showcased substantial variability in PM_{2.5} concentrations, peaking notably in December within the range of 43.2–301 $\mu g m^{-3}$, averaging $168 \pm 88.3 \mu g m^{-3}$, whereas lower concentrations ranging from 30.9 to 268 $\mu g m^{-3}$, with an average of $106 \pm 66.1 \mu g m^{-3}$, were observed in October. These concentrations displayed correlations with meteorological parameters, demonstrating a direct association with relative humidity and varying relationships with temperature and wind speed. The maximal PM_{2.5} concentrations aligned with lower temperatures ($19.1^{\circ}C$), while higher temperatures ($26.1^{\circ}C$) coincided with the lowest concentrations, illustrating distinct relationships with relative humidity percentages and wind speeds. Advanced spectroscopic analyses (RS and XRD) confirmed the presence of various minerals and elements within PM_{2.5} samples, encompassing calcite, calcium aluminosilicate, hematite, barite, quartz, gypsum, organic carbon, and nineteen elements identified by EDX. Morphological evaluations unveiled diverse particle shapes, from round, pointed, and irregular to rod-like, and agglomerate structures. SEM investigations delineated distinctive groups of anthropogenic and geogenic particles, emphasizing emission sources such as automobile emissions, crop residue burning, biomass burning, construction activities, soil dust, and industrial emissions. This comprehensive study lays the groundwork for source apportionment, vital for understanding consequential impacts on climate, visibility, and human health, fostering future investigations in this domain.



The average weight percent of individual elements in the study area.

d. Association of precipitation extremes and crops production and projecting future extremes using machine learning approaches with CMIP6 data:

Precipitation extremes have surged in frequency and duration in recent decades, significantly impacting various sectors, including agriculture, water resources, energy, and public health worldwide. Pakistan, being highly susceptible to climate change and extremes, has experienced adverse events in recent times, emphasizing the need for a comprehensive investigation into the relationship between precipitation extremes and crops production. This study focuses on assessing the association between precipitation extremes on crops production, with a particular emphasis on the Punjab province, a crucial region for the country's food production. The initial phase of the study involved exploring the associations between precipitation extremes and crops production for the duration of 1980-2014. Notably, certain precipitation extremes, such as maximum CDDs (consecutive dry days), R99p (extreme precipitation events), PRCPTOT (precipitation total) and SDII (simple daily intensity index) exhibited strong correlations with the production of key crops like wheat, rice, garlic, dates, moong, and masoor. In the subsequent step, four machine learning (ML) algorithms were trained and tested using observed daily climate data (including maximum and minimum temperatures and precipitation) alongside model reference data (1985-2014) as predictors. Gradient boosting machine (GBM) was selected for its superior performance and employed to project precipitation extremes for three distinct future periods (F1: 2025-2049, F2: 2050-2074, F3: 2075-2099) under the SSP2-4.5 and SSP5-8.5 derived from the CMIP6 (Coupled Model Intercomparison Project Phase 6) archive. The projection results indicated an increasing and decreasing trend in CWDs (maximum consecutive wet days) and CDDs, respectively, at various meteorological stations. Furthermore, R10mm (the number of days with precipitation equal to or exceeding 10 mm) and R25mm displayed an overall increasing trend at most of the stations, though some exhibited a decreasing trend. These trends in precipitation extremes have potential consequences, including the risk of flash floods and damage to agriculture and infrastructure. However, the study emphasizes that with proper planning, adaptation measures, and mitigation strategies, the potential losses and damages can be significantly minimized in the future.

WATER

e. CMIP6-Based Climate Projections and Trends for exploring Adaptations and Policies in Pakistan

Pakistan is largely dependent on agriculture; climate change induces considerable complexities for its anthropogenic systems, requiring detailed climate projections at fine spatio-temporal scales. This study employs bias-corrected daily climate data based on 13 CMIP6 General Circulation Models (GCMs), which were validated against CRU TS4. 03 datasets to comparatively assess past and projected climate conditions among SSP245 and SSP585 pathways. For two cropping season (Rabi, and Kharif) temperature and precipitation trends were investigated for Pakistan's main agricultural provinces, Punjab and Sindh. Mann-Kendall and Sen's slope tests were employed to investigate temperature and precipitation variations over time and space. Our CMIP6 based results reproduce reliable historical data both spatially and temporally, supporting its use in regional climate impact studies. At national scale, Tmin increase more than Tmax. In SSP585, Tmin is projected to increase by 5.22°C, while Tmax is expected to rise by 4.02°C, by 2100. Precipitation too has a more or less steady upward trend by 28% and 53% under SSP245 and SSP585, respectively. Summer and winter temperatures increase strongly in Punjab. Tmin is likely to rise between 1.6°C–4.8°C by 2100 across the different scenarios. Summer precipitation rises moderately under SSP245 at around 20–40% and increases steeply up to 100% under SSP585. In Sindh, both summer and winter temperature increases follow similar trends; summer Tmax can reach up to 4°C in SSP585. Precipitation in Sindh may increase as much as 187% during the summer season in late century. Under SSP585, projections of increasing temperatures indicate growing trends of heat stress across Pakistan, which is impactful for agricultural productivity and water resource management.

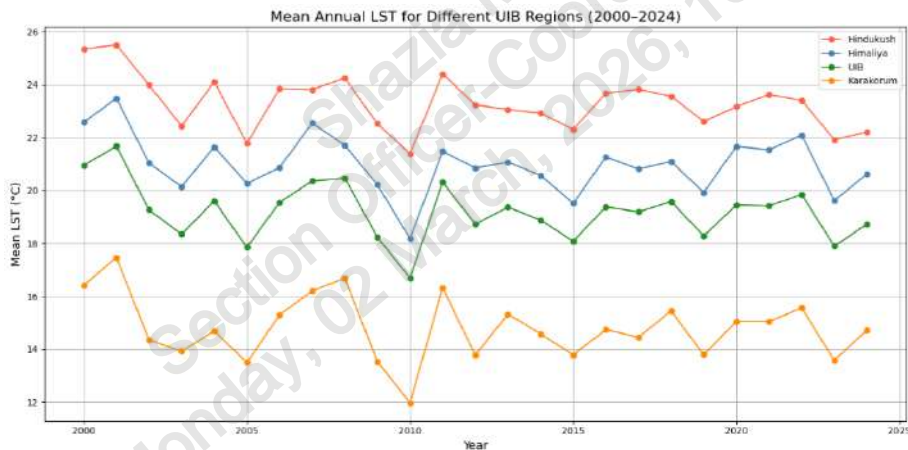
The findings underscore the importance of high-resolution climate models in formulating evidence-based adaptation plans. Major recommendations encompass heat-resilient crop species, improved irrigation infrastructure, and early warning systems. These are critical measures to protect food security and threats from climate change to Pakistan's agriculture and water sectors.

f. Spatio-Temporal Analysis and Mapping of Land Surface Temperature and Climatic Extremities in the Upper Indus Basin:

The Upper Indus Basin (UIB), spanning the Himalayan, Karakoram, and Hindu Kush (HKH) mountain ranges, is a critical region for understanding the impacts of climate change due to its glacial and snow-fed hydrological systems. This study conducts a detailed spatio-temporal analysis of Land Surface Temperature (LST) and associated climatic extremities in the UIB over a 25-year period (2000–2024). Using MODIS MOD11A2 8-day composite data, LST trends were mapped and analyzed across different sub-regions and timescales. Climatic extremities were identified through statistical thresholding methods and cross-validated using external data sources and literature. The analysis reveals significant spatial variability and an upward trend in temperature anomalies, particularly in lower-elevation zones. The project contributes to a deeper understanding of climate dynamics in the UIB and offers a foundation

for further research in regional climate modeling, risk assessment, and water resource planning.

This composite visualization presents yearly mean Land Surface Temperature (LST) maps for the Himalayan, Hindukush and Karakorum sub-region of the Upper Indus Basin (UIB), spanning from 2000 to 2024. Each small panel shows the spatial LST distribution during May–August of a given year, revealing both inter-annual variability and long-term patterns. Warmer areas are represented in orange-yellow shades, while cooler zones appear in purples and blues. The topmost large map aggregates these into a multi-year mean LST map, clearly showing warmer valleys and cooler high-altitude zones. This allows a visual understanding of how temperature varies spatially within the Himalayan belt.



Temporal patterns of temperature profile in HKH and individual ranges over period 2000 to 2024.

This time series plot shows the mean annual LST (°C) trends from 2000 to 2024 for four zones: the entire UIB, and the Hindu Kush, Himalayan, and Karakoram sub-regions. The Hindu Kush consistently exhibits the highest LST values, followed by the Himalayas and UIB average, with Karakoram being the coolest. The graph captures year-to-year fluctuations and illustrates a pattern of variability rather than a strictly linear warming trend. However, the overall visual suggests some regional warming phases, particularly in the early 2000s and early 2010. This visualization supports spatial findings and provides a temporal dimension for interpreting climate behavior in UIB.

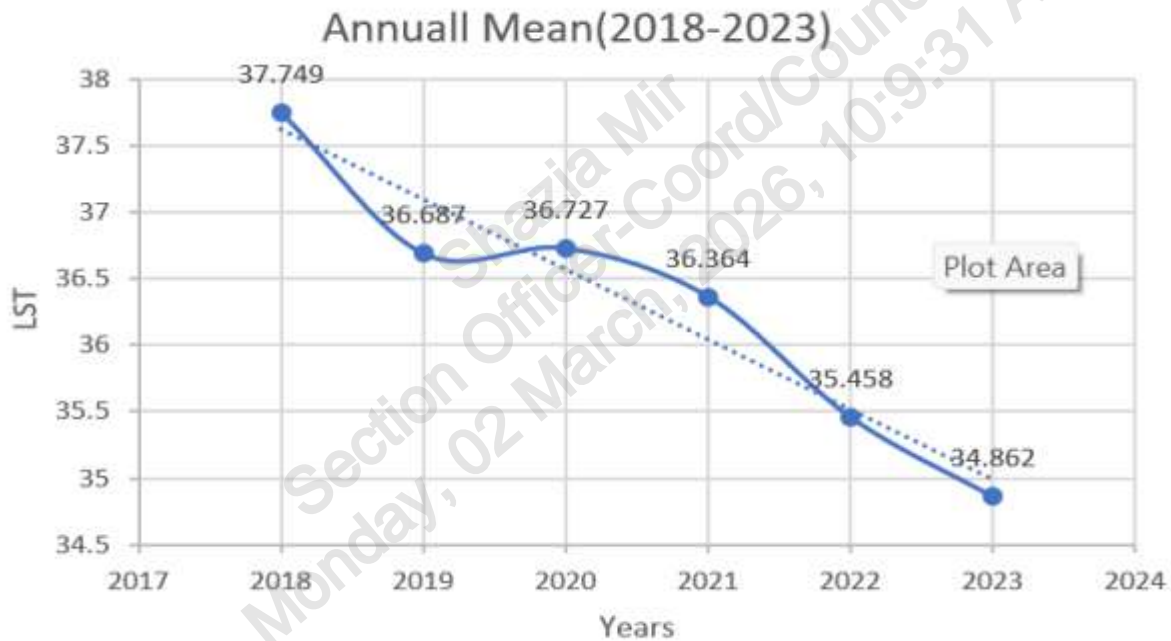
h. Climate Disaster Emission Nexus Mapping of Karachi (2018-2023)

This study investigates the spatiotemporal dynamics of climate stress, disaster vulnerability, and emission hotspots in Karachi, Pakistan, through an integrated Climate–Disaster–Emission Nexus framework. Using multi-source remote sensing datasets and geospatial analysis for the period 2018–2023, the research combines four interlinked layers i.e., climate, disaster, emission, and nexus to evaluate the interactions between land surface temperature (LST), precipitation variability, population exposure to heatwaves, and atmospheric pollutant concentrations (NO₂, SO₂, CO, PM_{2.5}). The climate layer identifies thermal stress zones, the

disaster layer quantifies population vulnerability, the emission layer maps pollutant intensities, and the nexus layer synthesizes these components to pinpoint composite risk zones. Data were sourced from global satellite repositories and processed using geospatial techniques, with hotspot intensity classified into low, moderate, high, and very high categories. In addition to spatial analysis, temporal trend evaluation was conducted to capture inter-annual variability and anomaly patterns. The methodological approach integrates both climatic and anthropogenic drivers, ensuring a holistic representation of urban environmental risks. Comparative assessment across years allowed the identification of emerging hotspots and the persistence of chronic risk zones. This integration strengthens the predictive capability of the framework for future climate–emission scenarios.

Results indicate a notable decline in annual LST from 2018 to 2023, with a slight rise in 2020, alongside spatial shifts in high- and very-high-risk zones. Coastal and low-lying areas generally exhibited lower nexus risk due to moderated temperatures and higher precipitation, whereas inland urbanized districts displayed persistent high thermal and emission stress, often coinciding with densely populated zones. The findings highlight the compounded risk from climatic extremes, urban heat, and anthropogenic emissions, underscoring the urgency of targeted urban planning, emission control measures, and climate adaptation strategies. This research provides a methodological framework for integrated risk mapping in rapidly urbanizing coastal cities and offers evidence-based insights for sustainable urban resilience planning in the face of climate change.

Analysis from **2018–2023** reveals that while some climatic indicators, like land surface temperature, have declined slightly, persistent high-risk zones remain due to non-climatic factors such as dense urbanization, degraded vegetation, weak infrastructure, and high pollution levels. Vulnerability is especially severe in densely populated, low-income areas, underscoring the need for **targeted, place-based interventions** rather than citywide uniform policies.



LST trends over Karachi during study period from 2018-2023

The annual LST trend graph provides a crucial temporal perspective on these spatial patterns. It indicates a general decrease in temperature from 2018 to 2023, with a slight increase observed in 2020. This temperature decline suggests a potential reduction in the magnitude of heat stress over time; however, localized hotspots remain persistent in the nexus maps. The persistence of high-risk and very high-risk zones in certain parts of the city, despite the overall temperature reduction, implies that factors beyond LST such as urban morphology, land use changes, emission intensities, and population density play a significant role in maintaining vulnerability levels.

AGRICULTURE

i. Machine learning-based province-level annual air pollutants assessment using Sentinel-5P TROPOMI, Google Earth Engine, and GIS

Air pollution is one of the most critical environmental challenges worldwide, threatening both ecological balance and human health. It affects urban and rural regions alike, with pollutant emissions resulting from industrial activities, vehicular exhaust, biomass burning, and energy production. To better understand spatial and temporal trends of air pollution, this study applied a satellite-based remote sensing approach combined with geospatial analysis tools. Data from the Sentinel-5P TROPOMI and MODIS sensors were analyzed using the Google Earth Engine (GEE) cloud platform to assess key atmospheric pollutants—Aerosol Optical Depth (AOD), Nitrogen Dioxide (NO₂), Carbon Monoxide (CO), Sulfur Dioxide (SO₂), Methane (CH₄), and Ozone (O₃)—over the period 2018 to 2024. ArcMap 10.8 was used to generate maps and visualize annual variations and spatial distribution patterns. This integrated methodology enabled efficient monitoring of pollutant concentrations, trend identification, and hotspot detection across the province

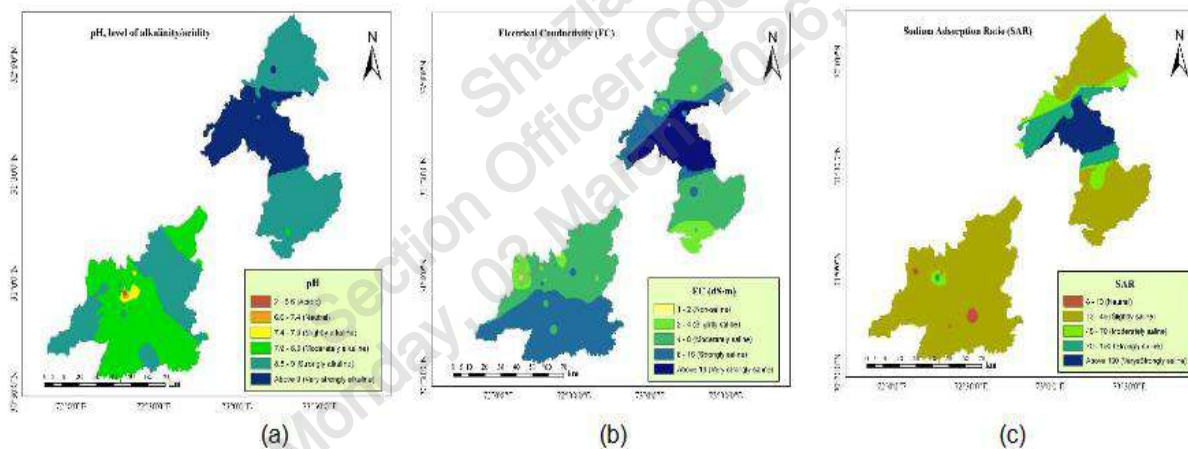
Aerosol Optical Depth (AOD) analysis revealed that the lowest values (0–0.32) occurred in 2019 and 2020, indicating relatively cleaner atmospheric conditions, while 2021 exhibited the highest AOD levels (2.21–4.00), likely due to intensified dust activity or increased anthropogenic emissions. The years 2022–2024 showed moderate AOD levels, with noticeable concentrations in the eastern and western regions. Carbon Monoxide (CO) concentrations ranged between 0.021 and 0.039 mol/m², with higher levels consistently observed in the eastern and southeastern districts—areas characterized by dense populations and substantial vehicular and industrial activity. Nitrogen Dioxide (NO₂) concentrations were elevated mainly in urban and industrial centers such as Quetta and Hub, reflecting strong associations with transportation and combustion-based emissions. Sulfur Dioxide (SO₂) levels peaked during 2018–2019 at 0.00096 mol/m², likely linked to industrial and energy generation sources, but showed a declining trend afterward, suggesting improvements in fuel quality or emission control measures. Methane (CH₄) concentrations displayed spatial and temporal variation, ranging from 1820 ppbv in northern regions during 2023 to 2020 ppbv in the eastern part of the province in 2021, potentially influenced by agricultural practices and localized climatic factors. Ozone (O₃) exhibited a consistent annual increase from 2018 to 2024, with higher concentrations in the northeastern areas and lower levels in central and southern regions. This upward trend indicates enhanced photochemical reactions driven by precursor gases (NO_x and VOCs) and changing meteorological conditions. Overall, the assessment identified clear pollution hotspots for NO₂ and CO in industrial and densely populated zones, alongside a general rise in O₃ concentration across the province, while the

variability in AOD and CH₄ underscores the combined influence of natural and anthropogenic factors on regional air quality.

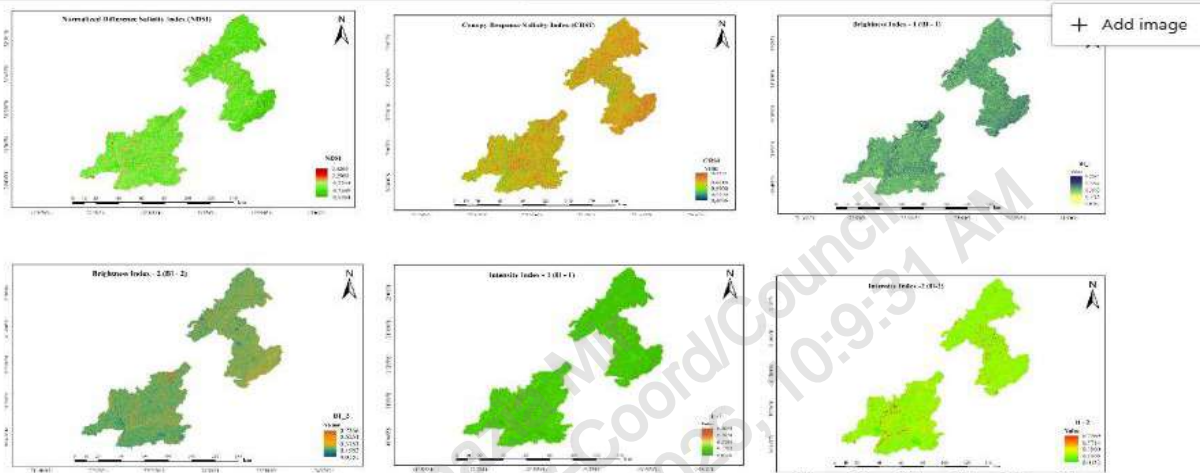
j. Spatial Soil Salinity Assessment by Using Principle Component Analysis and Geospatial Techniques in Central Punjab, Pakistan

Both natural and man-made soil salinity is a chief geological disaster in semi-arid and arid parts. In cultivated land, it has a negative impact on plant development and harvests, while in semi-arid and arid non-agricultural zones, due to subsidence, corrosion and groundwater quality, it affects urban structures, leading to additional soil erosion and land deprivation. The study was conducted at central Punjab, Pakistan with the aim to develop a baseline and to show the precision and accuracy of Geographic Information System (GIS) technology for delineating soil salinity in no data region. The samples of soil were gathered at deepness of 0-15 and 15-30 cm, and three factors (pH, Electrical Conductivity, and Sodium Adsorption Ratio) were analyzed in the laboratory. Landsat 8 OLI imagery were used for salinity indices development. A statistical index association was found between soil salinity noted in soil samples of field and 13 GIS-based salinity indices. The effect importance and model parameters for various soil salinity indices were assessed using regression model fitting. The data were divided into 3 categories: i) ground or field data, ii) brightness/intensity indicators, and iii) salinity indicators. Data were analyzed using principal component analysis (PCA). The results indicated that salinity indices were favorably related with ground data sets, but brightness/intensity indices had no significant relationship with ground or field data.

The integration of remote sensing and field observations proved highly effective for detecting soil salinity in the study area. Salinity indices such as NDSI, II-1, SI-4, SI-6, and SI-7 were identified as the most suitable for representing salinity variations across the region. High-resolution multispectral imagery demonstrated strong reliability in mapping and modeling soil salinity, enabling accurate spatial assessment. Furthermore, temporal monitoring of salinity dynamics is essential for informed decision-making and promoting sustainable natural resource management.



Soil pH (a), EC (b), and SAR (c) taken from exclamation of research location observation data



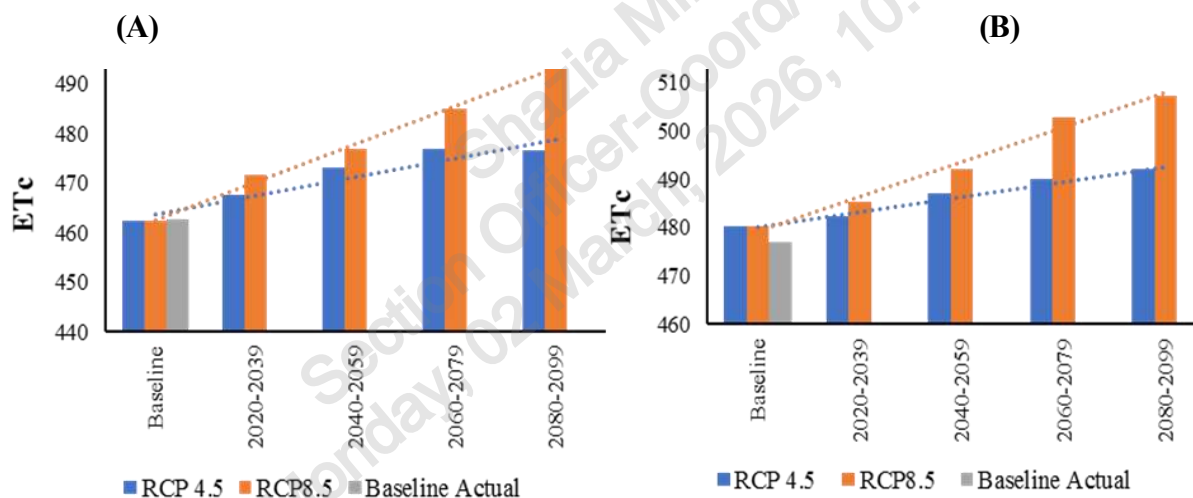
Brightness or Intensity Indices maps of the research site created through Landsat 8 OLI

k. Modelling the Wheat crop water and irrigation water requirements Using CROPWAT model: A Case study of Arid and semi-arid regions of Pakistan (2025)

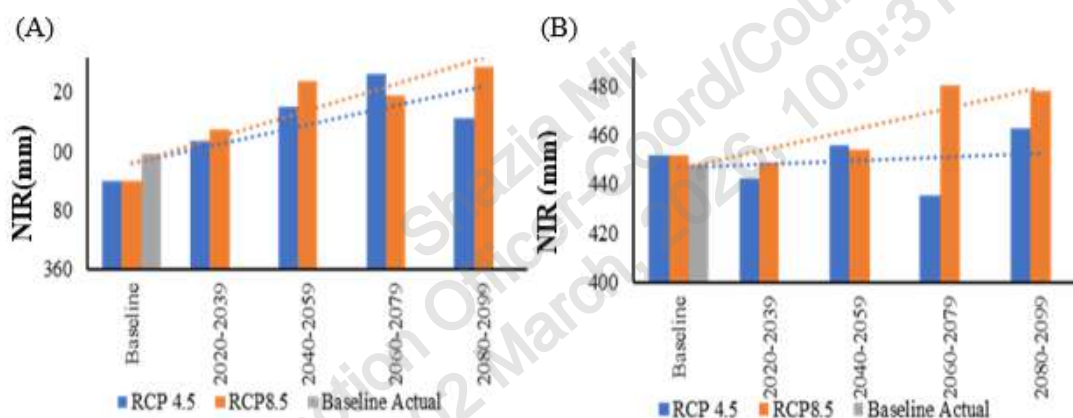
Water is a key factor in global food security, which is critical to agriculture. Dwindling water resources and increasing food demands require greater efficiency in water use, particularly in arid and semi-arid regions. Regulated deficit irrigation provides a means of reducing water consumption while minimizing adverse effects on yield. Models can play a useful role in developing practical recommendations for optimizing crop production under water-scarce conditions. Therefore, the current study was conducted to estimate crop water requirements (CWRs), net irrigation requirements (NIRs), and effective rainfall (Pe_{eff}) for wheat crop in arid (Bahawalpur) and semi-arid regions (Faisalabad) of Pakistan. Precipitation and temperature data predictions are derived from four pre-validated Coupled Model of the Inter comparison Project Phase 5 (CMIP5) of Global Climate Models (GCMs), namely i) MIROC5, ii) IPSL-CM5A_MR, iii) NorESM1-M and iv) CCSM4. Model data, including the geo-coordinates of the area, temperatures, relative humidity, solar radiation/sunshine hours, crop evapotranspiration and soil data, have been used as input to CROPWAT for simulation of CWR, NIR and Pe_{eff} in a historical period (1986-2005) and four consecutive future time series (2020-2039, 2040-2059, 2060-2079 and 2080-2099). The results showed that during the wheat growing season, CWR and NIR continued to increase. By the end of the 21st century, the CWR in semi-arid and arid areas of representative concentrated pathways (RCPs 4.5 and 8.5) increased by 3.01-6.86% and 2.46-5.64%, respectively. By 2099, under RCPs 4.5 and 8.5, the NIR in semi-arid and arid areas will increase by 5.49-10% and 2.41-5.86%, respectively. In the semi-arid and arid areas, the average seasonal Pe_{eff} will be reduced by 9.79% (RCP 4.5), 10.07% (RCP 8.5), 2.81% (RCP 4.5), and 3.16% (RCP 8.5) respectively. Therefore, semi-arid areas will be more affected than arid areas, and changes in climatic conditions will threaten the agricultural system by reducing Pe_{eff}.

The study revealed that semi-arid regions are more affected by current climate change compared to arid zones. Under RCP 4.5 and RCP 8.5 scenarios, the crop water requirement (CWR) for wheat in semi-arid regions is projected to increase by 3.01% and 6.86%, respectively, while in arid regions, the increase is relatively lower at 2.46% and 5.64%. Similarly, the net irrigation requirement (NIR)

is expected to rise by 5.49% and 10% in semi-arid areas and by 2.41% and 5.86% in arid areas under RCPs 4.5 and 8.5, respectively. A decline in effective precipitation (Peff) of 9.79% and 10.07% is predicted for semi-arid zones by the end of the 21st century under both emission pathways, whereas arid areas are likely to experience a modest increase of 3.16% and 2.81% in Peff under RCPs 4.5 and 8.5, respectively. An inverse relationship was observed between NIR and Peff in both climatic regions across all scenarios. The study recommends extending this analysis to other arid and semi-arid regions of Pakistan to validate the coupled CMIP5 GCMs and CROPWAT model projections. Moreover, the NorESM1-M model's precipitation outputs under RCPs 4.5 and 8.5 should be further cross-verified with regional climate models. Given the projected increase in NIR, the adoption of highly efficient irrigation techniques is strongly advised to enhance water conservation and reduce losses associated with conventional irrigation practices.



Changes in future crop water requirements (ETc) for wheat crop in (A) Semi-arid (Faisalabad) and (B) Arid area (Bahawalpur). Three treatments RCP 4.5, RCP 8.5 and Baseline actual. The lines on



the bars are trend lines

Changes in future net irrigation requirement (NIR) for wheat crop in (A) Semi-arid (Faisalabad) and (B) Arid (Bahawalpur) areas. Three treatments RCP 4.5, RCP 8.5 and Baseline actual. The lines on the bars are trend lines.

I. Towards sustainable waste management in peri-urban areas: A comprehensive analysis of household practices in Rawalpindi, Pakistan

Inefficient waste management poses a significant challenge to solid-waste management at the household level. A comprehensive understanding of current practices and perceptions of solid-waste management at this level is crucial for making informed decisions and establishing an integrated, sustainable waste-management system. Rawalpindi, the fourth most populous city in Pakistan, faces obstacles in infrastructure development and the effective delivery of utility services, including solid-waste management, due to its rapidly growing population and unplanned expansion of peri-urban areas. While limited studies have explored household solid-waste-management practices in urban centers, peri-urban zones have been largely overlooked. This study focuses on comprehensive assessment and comparison of household waste management under both public and private sector systems in the peri-urban areas of Rawalpindi. The data collection was done employing a household survey and cross-sectional questionnaire, utilizing a simple random sampling technique. Analysis involved cross-tabulation and chi-square tests.

The study indicates that the private sector demonstrates better performance than the public sector in waste management operations. Waste segregation practices show only a slight variation between public (46%) and private (54%) systems. Residents under both systems commonly perceive waste as aesthetically unpleasant and detrimental to health. Approximately 21.7% of respondents expressed negative perceptions toward waste, while 11.7% held neutral or differing views. Socio-demographic characteristics were found to significantly affect household waste management behaviors and perceptions. The findings highlight substantial potential for improving household-level waste segregation through targeted awareness and education campaigns. Strengthening public awareness can play a pivotal role in establishing an integrated and sustainable waste management framework.

B. Capacity Building:

GCISC periodically organizes capacity-building workshops and training sessions aimed at equipping students, researchers, and academicians at both national and subnational levels with advanced research methodologies and state-of-the-art modeling techniques. Additionally, the Centre extends its expertise by providing resource persons to various research and development institutions, universities, and community organizations, thereby fostering knowledge dissemination and technical training on critical climate change issues. Under the GCISC Internship Program, training has been imparted to BS/MS-level students from diverse universities. Furthermore, the Centre plays a pivotal role in strengthening provincial research departments by integrating them as collaborative partners in internationally funded projects, thereby enhancing their research capabilities and technical expertise.

GCISC's scientists, during 2024-25, contributed as resource persons in workshops and seminars organized by various entities. The scientists at the Center also actively participated in numerous national and international training workshops, acquiring expertise in a broad spectrum of areas, including climate science, climate modeling, seasonal forecasting, early warning systems, drought monitoring and assessment, hydrological modeling, crop simulation, water management, water surface runoff analysis, water-food-energy nexus, earth observation systems, space technology, and remote sensing/geographic information systems (RS/GIS) tools. These newly acquired skills are being effectively utilized in both ongoing and planned research endeavors at the Center. Furthermore, thirty-three students from prominent institutions such as the National University of Science and Technology (NUST), Islamabad, Bahria University, Islamabad, PMAS-Arid Agriculture University Rawalpindi, University of Agriculture, Faisalabad, and University of Engineering & Technology (UET) Peshawar participated in internships at GCISC for periods ranging from 2 to 3 months. During their tenure, the Center's researchers provided them with orientation lectures on climate science, modeling, and other analytical skills. These interns were supervised by GCISC researchers and assigned various studies by their university teachers and GCISC mentors, enabling them to gain practical experience and contribute to ongoing research initiatives.

Capacity Building Trainings on National GHG Inventory of Pakistan

Under its mandate to support evidence-based climate policy and enhance national technical capacity, the Global Change Impact Studies Centre (GCISC) led a series of provincial capacity-building workshops on the National Greenhouse Gas (GHG) Inventory system as part of Pakistan's Third National Communication (TNC) to the UNFCCC. These workshops were conducted in Karachi (23–26 August 2024), Quetta (26–30 August 2024), and Lahore (23–26 September 2024), targeting key stakeholders from provincial departments, research institutions, and academia. The trainings aimed to build participants' technical understanding of the 2006 IPCC Guidelines for National GHG Inventories, with a focus on sectoral emissions from Energy, IPPU, Agriculture, FOLU, and Waste. Sessions covered essential topics such as inventory planning, data collection, emission estimation methods, QA/QC, uncertainty assessment, and the use of IPCC inventory tools and common reporting tables (CRTs), in line with the requirements of the Biennial Transparency Report (BTR) under the Paris Agreement's Enhanced Transparency Framework (ETF). Through these workshops, GCISC directly contributed to strengthening sub-national capacity for climate transparency, promoting TACCC principles (Transparency, Accuracy, Completeness, Consistency, Comparability), and improving coordination between national and provincial actors in inventory preparation. Over 100 professionals were trained, laying the groundwork for a more robust and decentralized national GHG inventory system that supports Pakistan's climate commitments and long-term policy planning.

Stakeholder Consultations and Field Visits for Vulnerability & Adaptation (V&A) Assessment

These field visits focused on Vulnerability and Adaptation (V&A) assessments in key socio-economic sectors, including energy, agriculture, water, coastal management, forests & ecosystems, and public health. The consultative process aimed to seek input from the relevant stakeholders on potential climate induced risks and to identify suitable adaptation measures tailored to the local environment drawing upon collective expertise. These visits served as a

basis for collecting data, assessing risks, and identifying adaptation measures to facilitate a robust assessment of the region's vulnerability to climate change impacts. The field visits, through involvement of local communities, stakeholders, and indigenous knowledge holders, ensured that adaptation strategies are rooted in local realities and inclusive of diverse perspectives. The whole activity provided a more realistic assessment of on-ground conditions. Besides, the visits helped capacitating and empowering local stakeholders enabling them to effectively contribute towards the sustainable development and well-being of local communities and ecosystems.

Mass Awareness / Media Appearance:

The scientists at the Center disseminated numerous articles across prominent national newspapers, covering diverse facets of climate science and its implications for water resources, agriculture, and forestry. Additionally, these experts engaged as Keynote Speaker/ Panelist/ Resource Person/ Opening Remarks during the events and in interviews and offered insights into pressing matters such as heatwaves, glacier retreat, monsoon disruptions, food insecurity, challenges in wheat production, efficient irrigation practices, and other related concerns linked to climate change.

C. Memorandum of Understandings (MoUs)

During the reporting period, the Global Change Impact Studies Centre (GCISC) signed several Memoranda of Understanding (MoUs) to strengthen institutional partnerships, promote collaborative research, and advance Pakistan's climate science and policy objectives. These strategic collaborations focus on key areas including greenhouse gas accounting, climate finance, glacier monitoring, and climate-resilient development. Through these agreements, GCISC continues to expand its engagement with universities, research organizations, and development partners to enhance technical capacity, facilitate knowledge exchange, and support evidence-based climate action.

The details of the MoUs signed by GCISC are as follows:

- **GCISC and Islamic Relief Pakistan (IRP):** Collaboration on climate science and climate finance, IRP Office, Islamabad — 10 December 2024.
- **GCISC and Karakoram International University (KIU):** Joint research on glacier melting and mitigation strategies to protect glaciers and vulnerable communities, GCISC Office, Islamabad — 31 January 2025.
- **GCISC and Climate Resourcing Coordination Centre (CRCC):** Cooperation on climate science, GHG accounting, and climate finance, GCISC Office, Islamabad — 05 March 2025.
- **GCISC and University of Sargodha (UOS):** Partnership to promote collaborative research in climate science, Agriculture and Forestry, Islamabad — 10 March 2025.
- **GCISC and NED University of Engineering and Technology (NED UET), Karachi:** Agreement to jointly plan, develop, and implement projects contributing to educational, social, and economic development, GCISC Office, Islamabad — 13 June 2025.
- **GCISC and Dr. Sadiq Foundation (DSF):** Collaboration titled “Transformative Collaborations for Climate Resilience: Pioneering Thematic Financing Solutions”, GCISC Office, Islamabad — 23 June 2025.

D. Support & Services to the MoCC&EC

Preparation of the National GHG Inventory for UNFCCC Reporting

The compilation of greenhouse gas (GHG) inventories remained an overlooked domain in Pakistan until the Global Climate-Change Impact Studies Centre (GCISC) pioneered this effort. In adherence to Article 4, Paragraph 1(a), and Article 12, Paragraph 1(a) of the United Nations Framework Convention on Climate Change (UNFCCC), all non-Annex I countries, including Pakistan, commenced the development of GHG inventories. Through its pioneering initiatives, GCISC has now attained both national and international recognition as a leading institution with established expertise in the systematic compilation of GHG inventories.

During the year 2024, the national greenhouse gas (GHG) inventory was compiled for submission under the UNFCCC, forming a key component of the Third National Communication (TNC) and the First Biennial Transparency Report (BTR1). The 2021 GHG inventory was prepared in accordance with the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, applying a Tier 1 methodological approach with default emission factors. Total estimated GHG emissions for 2021 demonstrate a notable increase compared to inventories for 1994, 2008, 2012, 2015 and 2018. In 2021, total emissions stood at 521.46 MtCO_{2e}, up 31.6 MtCO_{2e} from the last reporting period (2018). This upward trend is predominantly driven by sectors that are key to economic development: energy, agriculture, industry and waste management. This highlights the challenge for countries like Pakistan of cutting emissions without adversely affecting economic activities. In the 2021 inventory, the AFOLU sector emerged as the largest emitter, accounting for 46.75% of total emissions, followed by energy at 40.90%. The waste sector was responsible for 6.22% of emissions, while the IPPU sector accounted for 6.13%.

Furthermore, the methodological improvements were undertaken in line with the IPCC 2006 Guidelines and 2019 Refinement, incorporating specific updates in Tier 2 livestock emissions, rice cultivation, and the sanitation sectors. Additionally, a UNICEF-supported Tier 2 GHG inventory was developed for sewerred and non-sewerred sanitation systems in Khyber Pakhtunkhwa (KP) province, enhancing the accuracy and regional relevance of emissions reporting.

Pakistan's Third National Communication on Climate Change (TNC) to the UNFCCC

GCISC played a pivotal role in supporting the Ministry in the preparation of Pakistan's Third National Communication on Climate Change (TNC) submitted to the UNFCCC. The Centre led the development of four major chapters of the report, namely: (1) National Circumstances & Institutional Arrangements, (2) National Greenhouse Gas Inventory (2020–21), (4) Vulnerability & Adaptation, (5) Constraints, Gaps, and Financial, Technical & Capacity Needs, and (7) Research & Systematic Observation. Under these components, GCISC provided comprehensive analytical and technical inputs, ensuring methodological consistency with the IPCC 2006 Guidelines and 2019 Refinement. The Centre coordinated data collection and validation across multiple sectors, developed the national GHG inventory using updated IPCC methodologies. The total estimated emissions in MtCO_{2e} for 2021 indicate a rise in

overall GHG emissions compared to previous inventories (1994, 2008, 2012, 2015, and 2018). The total estimated GHG emissions for 2021 amount to 518.9 MtCO_{2e}, with contributions from: i) Energy sector (212.83), ii) IPPU (25.52), iii) AFOLU (244.11), and iv) Waste (32.44) MtCO_{2e}.

The Centre also conducted climate vulnerability and adaptation assessments across agriculture, water resources, coastal areas, forests & ecosystem, energy, and health sectors. Furthermore, GCISC identified institutional and technical gaps, financial constraints, and capacity-building needs to enhance national climate action and reporting capabilities. In addition, the Centre documented Pakistan's progress in research and systematic observation, emphasizing advancements in climate modeling, data systems, and scientific collaboration. Through its leadership and technical expertise, GCISC strengthened the scientific foundation of the TNC, reinforcing Pakistan's commitment to transparency and evidence-based policymaking under the UNFCCC framework.

Preparation of Pakistan's Third Nationally Determined Contributions (NDC3.0)

Under Article 4 of the Paris Agreement, all Parties are required to prepare, communicate, and maintain successive Nationally Determined Contributions (NDCs) that reflect progressively enhanced ambition over time. GCISC served as the NDC secretariat and led the process of NDC3.0 preparation. As part of the preparation of Pakistan's Third Nationally Determined Contribution (NDC-3), a series of provincial consultations were organized to ensure an inclusive and representative process. These consultations brought together key stakeholders from all provinces and regions, including government departments, academia, civil society organizations, and the private sector. The sessions provided a platform for participants to share regional priorities, challenges, and opportunities related to climate mitigation and adaptation. Inputs from these dialogues were crucial in identifying province-specific actions, aligning them with national targets, and ensuring that local contexts and needs are reflected in the NDC-3 framework. This participatory approach not only strengthened ownership among provincial stakeholders but also enhanced coordination for effective implementation of climate commitments across Pakistan.

The NDC 3.0 reaffirms Pakistan's adherence to the principles of equity and Common but Differentiated Responsibilities and Respective Capabilities (CBDR-RC), emphasizing that effective climate action requires shared but fair responsibilities across nations. Pakistan's NDC 3.0 builds upon its earlier submissions and reflects significant progress made since the first NDC (2016) and its update (2021). Pakistan remains on track to achieve its target of reducing projected emissions by 50% between 2015 and 2030, 15% through domestic resources and an additional 35% contingent on international financial support; however, the required international financial support has not been received. Through NDC3.0, Pakistan would like to voluntarily reduce its GHG emissions up to 50% by 2035. Of this, 17% will be achieved unconditionally through domestic resources and policy measures, while the remaining 33% is conditional on the provision of adequate mostly grant-based or concessional international climate finance, complemented by technology transfer and capacity-building support. The estimated investment required to achieve these goals is USD 565.7 billion. According to World Bank's Pakistan Country Climate and Development Report 2022, an

indicative estimation of total investment needs for Climate-resilient and Low-Carbon development up to 2023 are USD 348 billion. The additional investment of USD 217.7 billion will be required by 2035. The National Economic Transformation Plan (2024-2029) also known as the 'URAAN Pakistan' provides the overarching development pathway for integrating climate action into Pakistan's economic and social agenda. It ensures that climate commitments are not treated in isolation, but as drivers of sustainable growth, resilience, and green transformation. Given Pakistan's acute vulnerabilities and the capital-intensive transition required for low carbon transition, financial support remains a critical enabler. Pakistan seeks enhanced access to international climate finance from both public and private sources, aligned with principles of equity and common but differentiated responsibilities. The country also intends to employ the cooperative approaches and market mechanisms available under Article 6 of the Paris Agreement, creating opportunities for enhanced ambition, innovation, and cost-effective emissions reductions. NDC 3.0 reflects Pakistan's dual approach: pursuing low carbon transition while building resilience against climate shocks. The submission emphasizes that the scale of ambition is far beyond what can be achieved through domestic capacity alone. Therefore, international cooperation, technology partnerships, and financial assistance are indispensable to enable Pakistan to deliver on its commitments while safeguarding human development gains

E. Inputs for parliamentary Business

As the research arm of the Ministry, GCISC plays a pivotal role in furnishing technical expertise on climate change, its impacts, and corresponding response strategies for parliamentary deliberations. In this capacity, GCISC regularly provides comprehensive inputs for National Assembly and Senate proceedings, including responses to parliamentary questions and substantive contributions to the deliberations of standing committees addressing climate-related concerns. The Centre has delivered detailed responses to National Assembly and Senate starred questions while also presenting technical briefs and analyses to the National Assembly Standing Committee on Climate Change, particularly concerning the intersections of climate change, agriculture, and food security. Furthermore, GCISC has actively contributed to various policy reports, furnished technical insights for joint and inter-ministerial coordination meetings, and provided responses to ministerial queries, memorandums, and other strategic documents, thereby strengthening evidence-based decision-making at the highest legislative levels.

F. Administrative Matters

- **Appointment of Head of the Organization (Executive Director, GCISC).**

In line with the amended SRO approved by Federal Government, the administrative ministry [MoCC & EC] initiated the recruitment process for appointment of ED-GCISC. Upon completion of the required official recruitment procedures, the Prime Minister appointed the new Executive Director of the Centre in MP-I scale, who assumed the charge of the post in October 2024.

- **Composition of Board of Governors, GCISC.**

Pursuant to the amendments to the GCISC Act, 2013 ratified by Parliament in January 2023 and in accordance with Section 5(3), the composition of the Board of Governors (BoG-GCISC) has been revised with the Prime Minister's approval to include seven non-ex officio members (three distinguished scientists, two eminent private-sector representatives, and two from civil society), as formally notified by MoCC&EC through correspondence F. No. 5(6)/2024/SO-AOs dated 04-11-2024 and 14-01-2025

- Additionally, under Section 5(3)(i) of the GCISC Act, 2013, Provincial Secretaries of Environment were requested to nominate one Technical Expert/Scientist from their respective provinces. After a lengthy process by Provinces, the nominations received and completed the Board's composition in May 2025, bringing the BoG-GCISC membership to 33.

- **Technical CC Related Input.**

During the year, consistently provided inputs on the most immediate letters / notes, queries of the ministry through hard letters and now via e. office system on the following official business;

- Technical input on Pakistan foreign affairs matters with other countries on bilateral, inter-ministerial, joint commission, joint sessions, SDGs, MoUs, Technical Cooperation Agreements, Strategic Partnership, Globalization require climate change related information on PM visits, Pak-Azerbaijan, Pak-Belarus, Pak-EU, Pak-Uzbekistan, Pak-Korea, Pak-Jordan, Pak-France, Sukuk Securities, Green Taxonomy, OIC programme, SCO related, Pak-China, Pak-Germany, Pak-Oman, UNEA-7, FAO, Green Finance, G2F, Indus Water Treaty, IPU, NDCs;
- Submission of responses on technical / non-technical inquiries on Material for Economic survey of Pakistan, Annual progress reports, Year books, Performance monitoring, KPIs, Principle of policies, Budget speech material, National security policy implementation process, institutional reforms related, Data base information, Audit related responses, different appointment, quota vacant posts related etc.
- The Centre has also provided responses on the letters of other Govt. Departments /non-government relevant stakeholders., MoFA, MoST, Planning Commission, FFC, etc.

Glimpses of GCISC major activities:



GCISC and Karakoram International University (KIU) signed an MOU at GCISC



Ms. Aisha Humera Ch, Secretary Ministry of Climate Change & Environmental Coordination (MoCC&EC), visited the GCISC – 4 March 2025

Executive Director, GCISC Active Participation in CoP-29 and Technical Input to Climate Negotiations



GCISC Active Participation in Negotiation Streams on Agriculture, Adaptation, Technology and Transparency, Panel Discussions, Side Meetings.



GCISC organized a National Consultative Workshop on “Research and Systematic Observation” Chapter of Pakistan’s Third National Communication (TNC) to United Nations Framework Convention on Climate Change (UNFCCC) at Best Western Hotel, Islamabad, on October 8, 2024



Developing Inclusive Climate Commitments: NDCs 3.0 for Pakistan, Workshop co-hosted by GCISC & SDPI, December 18, 2024



ICIMOD, Nepal Team Visits GCISC – 10 September 2024

3.4. Islamabad Wildlife Management Board (IWMB)

Introduction

The Islamabad Wildlife Management Board (IWMB) was established under Section 4 of the Islamabad Wildlife (Protection, Preservation, Conservation, and Management) Ordinance, 1979. Its main objective is to enforce the Islamabad Wildlife Ordinance and its accompanying Rules of 1983, ensuring the protection of wildlife and the environment within the Islamabad Capital Territory (ICT).

In 1980, the Margallah Hills National Park (MHNP) was officially designated as a National Park of Pakistan, covering an area of 67 square miles, while Rawal Lake and Shakarparian were also declared National Parks in Islamabad.

In 1981, the Federal Government set up a Wildlife Management Board, chaired by the Chairman of the Capital Development Authority (CDA) and including officials from both the CDA and the Federal Government. However, this Board remained inactive, and the management of MHNP was instead handled by the Environment Directorate of the CDA, without the involvement of the designated Board.

In 2014, Professor Z. B. Mirza, a prominent zoologist, filed a petition with the Islamabad High Court (IHC), highlighting the severe degradation of MHNP due to neglect by the CDA. After meetings between the petitioner, committee members, and CDA officials, the Cabinet Division forwarded its recommendations to the Federal Government. As a result, the Islamabad Wildlife Management Board (IWMB) was re-established on 7th July 2015, with Dr. Anis-ur-Rahman appointed as the first Chairman. He was succeeded by Ms. Rina Saeed Khan in November 2020. In February 2025, Ms. Aisha Humera Chaudhry, Secretary, Ministry of Climate Change and Environmental Coordination, was appointed as the Chairperson of the Islamabad Wildlife Management Board (IWMB). The appointment of non-ex-officio members of the Board is currently in process, subject to the approval of the rules governing Board membership.

The Islamabad Nature Conservation and Wildlife Management Act, 2024, was approved in August 2024 by the Govt. of Pakistan. This landmark legislation has further empowered the IWMB with enhanced legal authority, autonomy, and enforcement mechanisms for wildlife protection, habitat conservation, and sustainable management of natural resources within the Islamabad Capital Territory.

Currently, the IWMB is focused on strengthening its institutional capacity to effectively implement this Act and ensure the long-term protection of Islamabad's natural heritage.

1.1 Objectives

The IWMB has the following objectives:

- To safeguard and manage the unique and exceptional natural beauty of Islamabad for future generations, adhering to international conservation standards and actively involving local communities.
- To conserve, protect, and enhance the indigenous flora and fauna (biodiversity) in Islamabad, creating open spaces that enrich the quality of life for both present and future generations within a safe and secure environment.
- To regulate, control, and eliminate the illegal trade of wildlife species within the Islamabad Capital Territory (ICT).
- To develop and maintain physical infrastructure within the Margallah Hills National Park (MHNP), including roads and buildings. In accordance with legislation, all development plans must be submitted to and approved by the Islamabad Wildlife Management Board (IWMB) prior to implementation.
- To conduct research and develop management plans for the wildlife and ecosystems of the Margallah Hills National Park (MHNP) to ensure evidence-based decision-making, sustainable conservation practices, and improved management of natural resources.
- To undertake the rescue, rehabilitation, and release of injured or orphaned wildlife within the Islamabad Capital Territory (ICT).

1.2 Margallah Hills National Park

Margallah Hills National Park is situated adjacent to the capital city of Islamabad, with the emerging industrial center of Taxila to the northwest. Encroachments from these urban areas pose serious threats to the park's wilderness. However, the most significant and immediate threat comes from the growing populations of communities residing inside the park. Over the years, these local communities have allowed their livestock to graze freely, causing destruction to the vegetation cover and trampling young seedlings. Additionally, residents cut trees for fuel, collect fodder for their animals, and divert natural water streams to cultivated plots near their homes. Some individuals even engage in hunting native wildlife for both sustenance and sport. Improper disposal of solid and liquid waste further exacerbates negative impacts on environmental and ecological resources.

Within the park, several rock mining quarries severely degrade the habitat. These quarries operate under lease arrangements made by the Planning Directorate of the Capital Development Authority (CDA). While some leases were granted after the park's establishment, public pressure, mainly from a citizens' group called "*The Margallah Hills Society*," led to the termination of such leases. The CDA ordered the closure of all mines on 31st July, 1991, with most discontinuing operations and others expected to close in the near future. Notably, the Fecto Cement Company's 30-year lease for mining limestone, granted in 1983, is exempt from this closure order.

Fires are a common occurrence in the Margallah Hills, requiring substantial expenditure and manpower for extinguishment. About 85% of these fires occur during the dry May-June period before the monsoon rains. The annual average number of fires ranged from 21-49 from 1986 to 2024, with many being manmade and concentrated on upper slope or ridge-top sites, particularly on southern aspects.

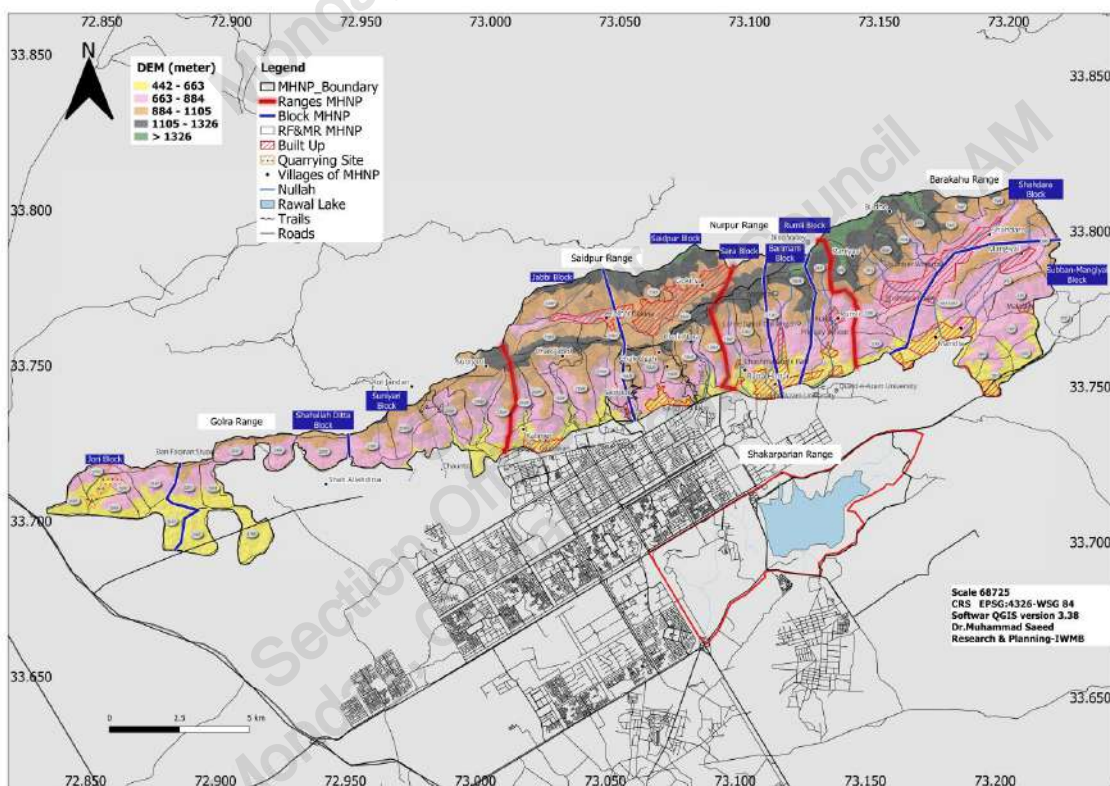
The park also faces the challenge of alien invasive vegetation species that are growing rapidly, competing with native species and disrupting the delicate balance of the ecosystem. The invasion of exotic vegetation, such as Paper Mulberry, *Parthenium Spp.*, and *Lantana Spp.*, not only impacts the vegetation balance but also contributes to an increase in the incidence of allergies.

1.3 Area

The Margallah Hills range between 456 m and 1,580 m in altitude. The topography is rugged, with numerous valleys and steep slopes. Rocks have been observed to date back to the Jurassic and Triassic ages, limestone being characteristic of the region (though shale, clay, and sandstone are also present). Soils are dark, with a high mineral content, and are capable of supporting good tree growth despite being shallow. The hills are an extension of the Himalayan range and form the northern boundary of the Potohar plateau. The area is drained by the River Kurang and its tributaries, which flow into the Soan River.

The climate is subtropical semi-arid. The region lies in the monsoon belt and experiences two rainy seasons. Winter rains last from January until March, and summer rains from July to September. Temperatures range from 1-15 °C in winter and 20-40 °C during the summer. Annual average rainfall is 1,000 mm. There have been occasional incidents of light snowfall in severe winters.

There are at least 38 species of mammals, 350 species of birds reported from the Margallah Hills within the MHNP. There are 32 species of reptiles and 9 species of amphibians reported.



Map of Margallah Hills National Park

1.4 Governing Body

In pursuance of the approval of the Prime Minister, conveyed vide Prime Minister's Office letter No. F. No. 6(9)/2020-Admn-UU-IWMB dated 23.11.2020, Ms. Rina Saeed Khan was appointed as the Chairperson of the Islamabad Wildlife Management Board (IWMB). In exercise of the powers conferred by Section 4 of the Islamabad Wildlife (Protection, Preservation, Conservation and Management) Ordinance, 1979 (LXX of 1979), read with sub-rule (a) of Rule 2A of the Islamabad Wildlife (Protection, Conservation and Management) Rules, 1983, the Federal Government reconstituted the Islamabad Wildlife Management Board on 23rd October 2020.

Subsequently, in exercise of the powers conferred under Section 3(2) of the Islamabad Nature Conservation and Wildlife Management Act, 2024, the Federal Government, vide Notification No. F. No. 10(15)/2021/IWMB/AOs dated 7th February 2025, appointed Ms. Aisha Humera Chaudhry, Secretary, Ministry of Climate Change and Environmental Coordination, as the Chairperson of the Islamabad Wildlife Management Board (IWMB). The appointment of non-ex-officio members of the Board is presently under process. The process for the appointment of non-ex-officio Board members, under Section 3(3) of the Islamabad Nature Conservation and Wildlife Management Act, 2024, is subject to the approval of the rules governing Board membership. The current Board consists of the following members, namely:

1.4.1 Ex. Officio Members

01.	Secretary, Ministry of Climate Change and Environmental Coordination	Member
02.	Joint Secretary (Admn & Dev), Ministry of Climate Change and Environmental Coordination	Member
03.	Member (Environment), Capital Development Authority	Member
04.	An officer not below the rank of BS-202 appointed by Mayor of Islamabad/Head of Municipal Corporation of ICT	Member
05.	Deputy Commissioner, ICT	Member

1.4.2 Non-Ex-Officio Members

06.	Vacant	Member
07.	Vacant	Member
08.	Vacant	Member
09.	Vacant	Member

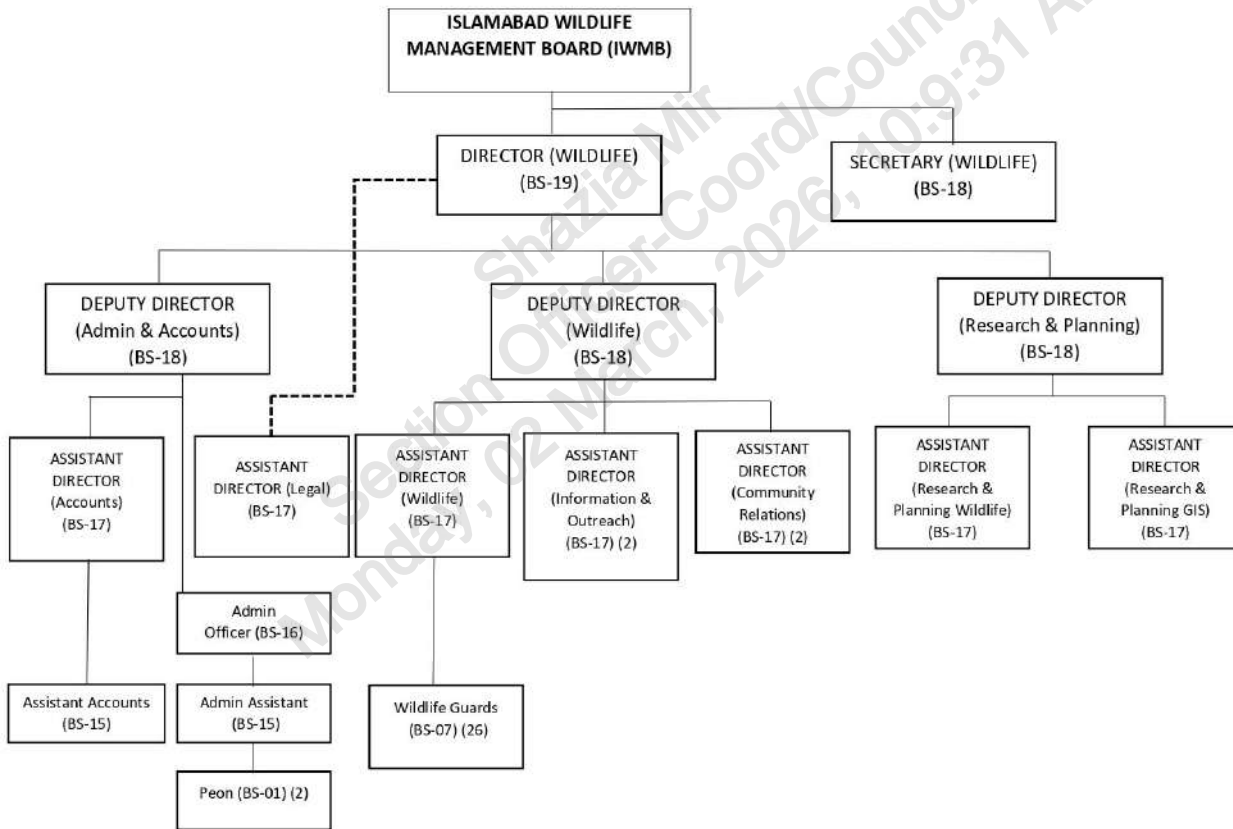
1.5 Organizational Strength

The IWMB has a team of 45 members (officers and officials) that are working for the conservation and protection of wildlife species and National Park in Islamabad. The detail of strength is given below;

Sr.#	Designation & Scale	Sanctioned	Working	Vacant
01.	Director (Wildlife) (BPS-19)	01	0	01
02.	Secretary (Board) (BPS-18)	01	01	0

03.	Deputy Director (Research & Planning) (BPS-18)	01	01	0
04.	Deputy Director (Admin & Accounts) (BPS-18)	01	0	01
05.	Deputy Director (Wildlife) (BPS-18)	01	01	0
06.	Assistant Director (Wildlife) (BPS-17)	01	01	0
07.	Assistant Director (Research & Planning-Wildlife) (BPS-17)	01	01	0
08.	Assistant Director (Research & Planning-GIS) (BPS-17)	01	0	01
09.	Assistant Director (Information & Outreach) (BPS-17)	02	01	01
10.	Assistant Director (Community Relations) (BPS-17)	02	02	0
11.	Assistant Director (Accounts & Finance) (BPS-17)	01	01	0
12.	Assistant Director (Legal) (BPS-17)	01	01	0
13.	Admin Officer (BPS-16)	01	01	0
14.	Admin Assistant (BPS-15)	01	01	0
15.	Account Assistant (BPS-15)	01	0	01
16.	Wildlife Guard (BPS-07)	26	21	05
17.	Peon (BPS-02)	02	01	01
Total		45	34	11

ORGANIZATION CHART OF ISLAMABAD WILDLIFE MANAGEMENT BOARD (Existing)



2. ROLE AND FUNCTION

Under Section 6(2) of the Islamabad Nature Conservation and Wildlife Management Act, 2024, the roles and functions of the Islamabad Wildlife Management Board (IWMB) are as follows:

- a. Administer and implement the provisions of this Act, rules, regulations, policies, guidelines and directives issued thereunder;
- b. Make policies, draw plans, including management plans and programmes for protection, promotion, preservation, conservation and management of nature in Protected Areas;
- c. Implement policies, plans, including management plans and programmes for protection, promotion, preservation, conservation and management of nature in Protected Areas;
- d. Prepare, submit, promote, implement or execute projects for the protection, conservation, rehabilitation and improvement of wildlife in Protected Areas;
- e. Implement all directions with respect to development and maintenance of areas designated by the Federal Government as protected areas;
- f. Every three years prepare and publish a report on the state of nature in Protected Areas;
- g. Propose to the Administrative Division suitable projects for submission to international and local institutions for funding;
- h. Prepare policy papers and concept notes and provide technical input for formulating national policy positions for international conferences or negotiations;
- i. Work in collaboration with relevant Government Agencies, non-governmental organizations and other stakeholders, and after conducting relevant research and studies set targets and coordinate actions with respect to the objectives of Nature Act, 2024;
- j. Request Auditor General of Pakistan to audit the accounts of the Board;
- k. To make regulations, subject to approval of the Federal Government, for carrying out the purposes of Nature Act, 2024.

3. GOALS AND TARGET

Islamabad Wildlife Management Board is working for the conservation of wildlife in Margallah Hills National Park and ICT with following goals and targets;

- To protect and manage Islamabad's unique and outstanding natural beauty for generations to come, through international standards while engaging local communities.
- To preserve, protect, and enhance the indigenous flora and fauna (biodiversity) in Islamabad and create open space to enrich the quality of life for present and future generations in a safe and secure environment.
- Management and Control of illegal trade of wildlife species in Islamabad Capital Territory (ICT), Islamabad.
- Development and maintenance of physical infrastructure inside the MHNP such as roads and buildings. Consistent with legislation, all plans related to roads and buildings need to be shared and approved by the IWMB before implementation.
- Rescue the wild animals in Islamabad Capital Territory that need treatment and further rehabilitation.
- Control the Illegal collection of natural resources from Margallah Hills National Park.
- Create awareness and education among citizens to protect wildlife and their habitat for future generations.
- Community engagement programs developed to empower custodian communities to protect Margallah Hills National Park resources in a sustainable way.
- Scientific research on the Margallah Hills National Park resources to protect these assets scientifically.
- Promotion of Eco-Tourism and responsible tourism, following the principle of "*My Waste My Responsibility*."
- Establish and enforce sustainable waste management practices within Margallah Hills National Park.
- Implement measures to minimize the impact of climate change on the park's ecosystem.
- Collaborate with educational institutions for environmental education programs targeting schools and colleges in the region.
- Regularly update and implement a comprehensive fire prevention and management strategy.
- Introduce and enforce guidelines for responsible pet ownership within the park.

- Implement measures to control invasive species and restore affected ecosystems.
- Establish a comprehensive monitoring system for wildlife population trends and habitat health.
- Facilitate and support research partnerships with local and international institutions to enhance knowledge about the Margallah Hills National Park ecology.
- Develop and implement a comprehensive eco-friendly waste disposal system for visitors within the Margallah Hills National Park.

4. ACTIVITIES

Islamabad Wildlife Management Board activities related to following;

- Protection of Wildlife
- Community Relations
- Information and Outreach
- Research and Planning
- Rescue and Rehabilitations

4.1 Protection of Wildlife

- Enforcing measures to prevent illegal hunting, poaching, and trade of wildlife species in Islamabad.
- Implementing wildlife rescue and rehabilitation programs.
- Conducting regular patrolling and surveillance to prevent encroachments and protect the natural habitat.
- Collaborating with law enforcement agencies to ensure the safety and well-being of wildlife within the jurisdiction.

4.2 Community Relations

- Developing and implementing community engagement programs to raise awareness about wildlife conservation.
- Empowering local communities to become custodians of the natural resources in a sustainable manner.
- Facilitating educational programs and workshops to promote understanding and appreciation of wildlife.
- Encouraging responsible and sustainable practices among local communities living in and around protected areas.

4.3 Information and Outreach

- Disseminating information about wildlife conservation through various channels, including social media, websites, and community events.
- Conducting awareness campaigns to educate the public about the importance of preserving biodiversity.
- Collaborating with media outlets to promote wildlife conservation messages.
- Providing accessible and accurate information about Islamabad's wildlife and conservation efforts to the public.

4.4 Research and Planning

- Conducting scientific research on wildlife species, ecosystems, and their interactions within the Islamabad Capital Territory and Margallah Hills National Park.
- Developing comprehensive conservation plans and strategies based on scientific findings in Margallah Hills National Park.
- Collaborating with research institutions and universities to enhance knowledge about the ecology of Margallah Hills National Park.
- Participating in regional and international forums to stay updated on the latest research and conservation trends.

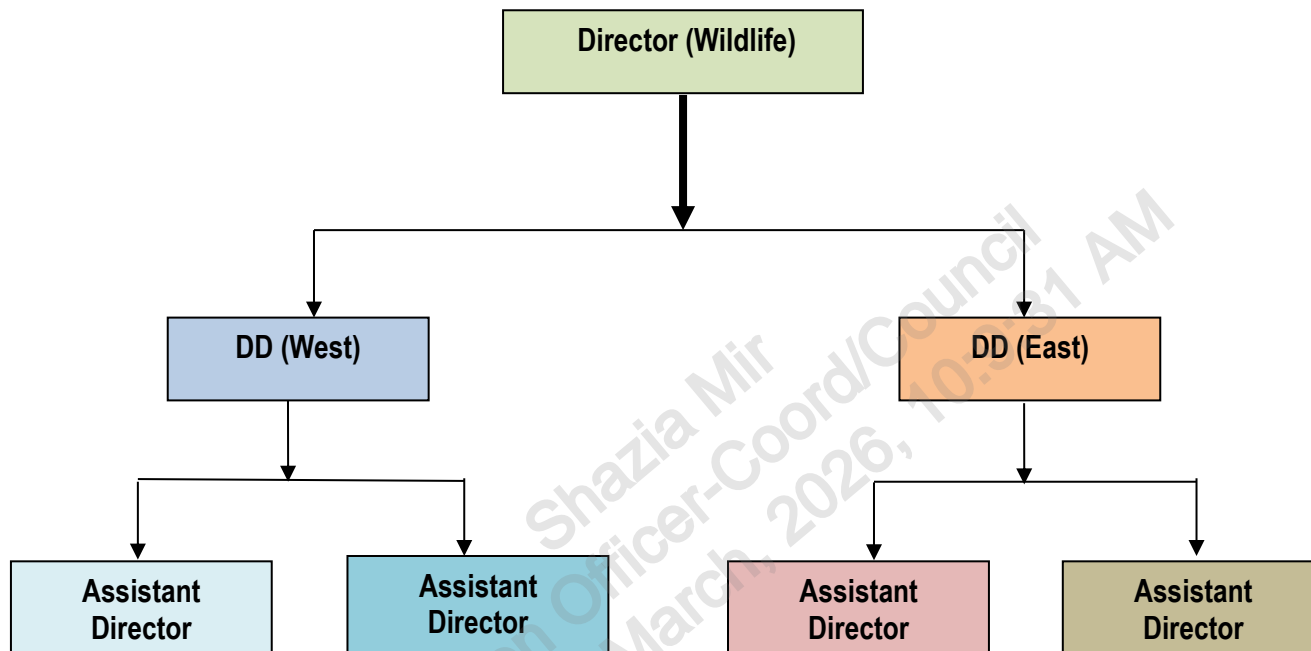
4.5 Rescue and Rehabilitation

- Conducting assessments on injured, sick, or distressed wildlife species within the Islamabad Capital Territory and other wildlife department to determine appropriate rescue and rehabilitation measures.
- Developing comprehensive rescue and rehabilitation plans and strategies based on the needs of the species.
- Collaborating with wildlife hospitals, veterinary clinics, and rehabilitation centers to ensure proper care and treatment for rescued animals.
- Participating in regional and international forums to stay informed on the latest practices, techniques, and trends in wildlife rescue, rehabilitation, and release.

5. ACHIEVEMENTS

5.1 Protection of Wildlife

The protection of Margallah Hills National Park (MHNP) and its wildlife is the core responsibility of the IWMB. Staff members are deputed across different valleys of the park to safeguard its natural resources and wildlife. The entire national park is divided into four ranges, with each range further divided into blocks. Each range is overseen by an Assistant Director, while the Eastern and Western areas are managed by Deputy Directors. Maps of each range have been developed to ensure better protection of the park's resources. This strategic plan has been instrumental in controlling illegal activities within MHNP and has helped significantly reduce such actions.



Strategic Plan for the protection of Margallah Hills National Park

5.1.1 Wildlife Protection and Patrol

Field staffs were deployed across all ranges of the park, including Saidpur, Nurpur, Ratta Hottar, Golra, Barakahu for patrol in major trails (Trail-1 to Trail-7), viewpoints, Pir Sohawa Road, Bari Imam, Shahdara, Mangial, Shah Allah Ditta, and forested valleys, to safeguard its rich biodiversity. MHNP is home to 38 mammal species, 350 bird species, 32 reptiles, 9 amphibians, and over 650 plant species.

The IWMB continued daily patrols, monitoring, and conservation efforts against threats such as illegal wood cutting, hunting, wildlife trade, encroachments, and habitat degradation. The IWMB also coordinated with the police and Capital Development Authority (CDA) to strengthen enforcement and ensure effective protection of wildlife and natural resources within the Islamabad Capital Territory (ICT).

5.1.2 Forest Fire in Margallah Hills National Park

The fire season in Margallah Hills National Park (MHNP) typically begins in April and ends by mid-July each year. During this season, an average of 15 (fifteen) fire incidents are reported annually. The intensity of these fires is generally low to medium, with most fires lasting between 4 to 6 hours and brought under control swiftly. However, one significant incident in the Rumli area lasted approximately 12 hours due to high wind speeds, which hindered firefighting efforts.

As of the current season (2025), a total of fifteen (15) fire incidents have been reported, affecting approximately 68.86 hectares (170.17 acres) of forested area. This damage was

calculated using standardized assessment sheets developed and used by the Islamabad Wildlife Management Board (IWMB), accounting for all relevant environmental factors.

5.1.2.1 Affected Vegetation and Habitat

Most fire outbreaks occurred on south-facing slopes dominated by scrub forest. The following major plant species were reported as damaged during these incidents:

5.1.2.2 Tree and Shrub Species

1. **Chir Pine** (*Pinus roxburghii*)
2. **Phulai** (*Senegalia modesta*)
3. **Dhaman** (*Grewia optiva*)
4. **Amaltas** (*Cassia fistula*)
5. **Sheesham** (*Dalbergia sissoo*)
6. **Beri** (*Ziziphus mauritiana*)
7. **Santha** (*Dodonaea viscosa*)
8. **Granda** (*Carissa opaca*)
9. **Lantana** (*Lantana camara*)
10. **Baiker** (*Adhatoda vasica*)

5.1.2.3 Grasses and Ground Cover

Grass species and ground flora, including herbs and shrubs, were severely affected, while tree species were partially impacted due to their higher fire resistance.

5.1.2.4 Wildlife and Environmental Impact

These fires have significant environmental and ecological consequences. Smoke and particulate matter from the fires affects both local communities and tourists visiting the park. The timing of the fires overlaps with the breeding season of birds, especially ground-nesting species such as:

1. **Kalij Pheasant** (*Lophura leucomelanos*)
2. **Grey Partridge** (*Francolinus pondicerianus*)
3. **Black Partridge** (*Francolinus francolinus*)

This overlap poses a serious threat to avian biodiversity, particularly through the destruction of nests and habitat loss. During a recent fire incident, IWMB staff found a single chick of the Black Partridge (*Francolinus francolinus*), estimated to be one to two days old, in the affected area. The nest had been completely destroyed, and the adult bird had already flown away.

In addition to bird species, reptiles and amphibians that inhabit burrows in the area were also affected. These animals typically have limited home ranges and are unable to relocate quickly, making them especially vulnerable during wildfires. Moreover, the fire also impacted soil macrofauna, which play an essential role in nutrient cycling and the food chain, thereby disrupting the ecological balance within the park.



Black Partridge found in MHNP

5.1.2.5 Fire Prevention and Control Measures

Before fire season 2025, a pre-season planning meeting was chaired by the Secretary of the Ministry of Climate Change & Environmental Coordination (MoCC&EC) and the Chairperson of IWMB in which all stakeholders present. Then further issue highlighted in 53rd Board Meeting, it was decided that the Capital Development Authority (CDA) take the primary responsibility for firefighting operations, with IWMB acting in a supportive role.

5.1.2.6 Firefighting Resources and Deployment

- CDA has hired Daily Paid Labor (DPL) as per its Fire Management Plan.
- 37 fire pickets have been established, with a total of 617 personnel deployed across MHNP.
- IWMB staff are working in close coordination with CDA teams and providing on-ground assistance.

5.1.2.7 Community Awareness and Education

IWMB has also implemented a comprehensive fire awareness campaign, including:

- 26 community awareness sessions conducted by IWMB's Community Relations officers in local villages and schools.
- Distribution of Information, Education, and Communication (IEC) materials such as posters, brochures, and signboards along roads and at trailheads.
- Awareness sessions focused on fire prevention, safety practices, and the ecological importance of MHNP.

Additionally, electronic and social media platforms have been used to reach a broader audience. Radio broadcasts and regular updates through IWMB's official pages aim to educate the public and encourage responsible behavior within the park. The details are given below table No. 1.

The Islamabad Wildlife Management Board (IWMB) remains fully committed to supporting the Capital Development Authority (CDA) during the 2025 fire season. The success of fire prevention and mitigation strategies has been the result of coordinated efforts, which rely on continued inter-agency collaboration, effective deployment of resources, and active public engagement. These efforts have borne fruit, as the number of fire incidents this year has remained low, which is essential for safeguarding the biodiversity and ecological integrity of Margallah Hills National Park.

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Section Officer-Coord/Council
Monday, 02 March, 2026, 10:9:31 AM

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Section Officer-Coord/Council
Monday, 02 March, 2026, 10:9:31 AM

Number of Incidents	Extent of Fire	Areas Affected (hectare)	Damaged Flora, Fauna and ecosystem	Estimated environmental and economic losses	Measures undertaken for fire control and preventions
15 (Fifteen)	Medium to Low	68.86	<p>Chir Pine (<i>Pinus roxburghii</i>)</p> <p>Phulai (<i>Senegalia modesta</i>)</p> <p>Dhaman (<i>Grewia optiva</i>)</p> <p>Amaltas (<i>Cassia fistula</i>)</p> <p>Sheesham (<i>Dalbergia sissoo</i>)</p> <p>Beri (<i>Ziziphus mauritiana</i>)</p> <p>Santha (<i>Dodonaea viscosa</i>)</p> <p>Granda (<i>Carissa opaca</i>)</p> <p>Lantana (<i>Lantana camara</i>)</p> <p>Baiker (<i>Adhatoda vasica</i>)</p> <p>Kalij Pheasant (<i>Lophura leucomelanos</i>)</p> <p>Grey Partridge (<i>Francolinus pondicerianus</i>)</p> <p>Black Partridge (<i>Francolinus francolinus</i>)</p>	<p>i. Fires produce significant amounts of smoke, negatively affecting the health and comfort of local residents and tourists visiting the park.</p> <p>ii. Fires occur primarily during the breeding season of birds, especially ground-nesting species, leading to direct harm to wildlife.</p> <p>iii. Affected bird species include: Kalij Pheasant (<i>Lophura leucomelanos</i>) Grey Partridge (<i>Perdix perdix</i>) Black Partridge (<i>Francolinus francolinus</i>)</p> <p>iv. Destruction of nests and displacement of adult birds has been observed.</p> <p>v. Grasses, herbs, and shrubs are severely damaged, while tree species are partially affected, with canopy and bark damage in some areas.</p> <p>vi. Fires result in the loss of habitat, reducing vegetation cover and impacting food sources and shelter for wildlife.</p> <p>vii. Soil macrofauna, which play a key role in nutrient cycling and ecosystem functioning, are also affected.</p> <p>viii. Reptiles and amphibians that live in burrows are particularly vulnerable due to limited mobility and small home ranges, resulting in high mortality.</p>	<ul style="list-style-type: none"> • CDA has hired Daily Paid Labor (DPL) as per its Fire Management Plan. • 37 fire pickets have been established, with a total of 617 personnel deployed across MHNP. • IWMB staff are working in close coordination with CDA teams and providing on-ground assistance. • 26 community awareness sessions conducted by IWMB's Community Relations officers in local villages and schools. • Distribution of Information, Education, and Communication (IEC) materials such as posters, brochures, and signboards along roads and at trailheads. • Awareness sessions focused on fire prevention, safety practices, and the ecological importance of MHNP. • A dedicated helpline number allocated for report fire incidents.

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Table 1. Damage and loss estimates from Forest Fire in Margallah Hills National Park, Islamabad during fire season 2025.

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Monday, 02 March, 2026, 10:9:31 AM



Fire Control activities in MHNP during Fire Season-2025



Awareness session in Local schools and communities of Margallah Hills National Park



5.1.3 Control Illegal Activities in MHNP

During July 2024 to June 2025, the field team of Margallah Hills National Park played an active and dedicated role in controlling illegal activities, including wood cutting, encroachments, hunting, forest fires, and habitat degradation. Their consistent efforts and on-ground vigilance significantly contributed to protecting the park's natural resources.

Violations of the Islamabad Nature Conservation and Wildlife Management Act, 2024 were promptly addressed by the staff, and FIRs were registered against offenders. During this period, a total of 3 FIRs were registered: one for illegal hunting and two for illegal wood cutting. The field team apprehended wood cutters, goat grazers, and unauthorized collectors of Non-Timber Forest Products (NTFPs) and, in coordination with the CDA Environment Directorate imposed fine.

5.1.4 Control on Encroachments in MHNP

During July 2024 to June 2025, 35 encroachment incidents were reported in Margallah Hills National Park, including house constructions, digging, wall building, and water tank installations in areas such as Saidpur, Nurpur, and Ratta Hottar. These reports were submitted to the CDA Environment Wing and the Deputy Commissioner Islamabad for enforcement, as IWMB has limited resources, while the CDA possesses the machinery and authority to demolish encroachments.

Notably, under the direction of the Honorable Supreme Court of Pakistan, IWMB oversaw the demolition of the Monal and Lamontana restaurants, which had been constructed within the park boundaries without Environmental Impact Assessments (EIA) or other required environmental approvals, in violation of the Pakistan Environmental Protection Act, 1997. This action served as a precedent to deter future encroachments, emphasizing that both local residents and institutions must comply with environmental laws and respect the park's protected status.

5.1.5 Control on Illegal Trade & Hunting of Wildlife

The Islamabad Wildlife Management Board (IWMB) remained vigilant against poaching, illegal wildlife trade, and cruelty to animals during the year. Regular raids were conducted in coordination with the CDA Environment Directorate and law enforcement agencies. Traps were removed from areas such as E-7 and adjacent forested zones to protect native wildlife.

The IWMB team also addressed illegal wildlife housing and trade, including cases involving the Lucky Irani Circus, which was found keeping wildlife unlawfully. During the year, the team rescued and confiscated 3 Indian pangolins, 3 rhesus monkeys used for dancing, and 3,647 birds (including House Sparrows, Baya Weavers, Spotted Munias, and Common and Bank Mynas) from illegal captivity, ensuring their proper rehabilitation and protection.

5.1.6 Conservation of Natural Habitat and Control of Invasive Species

For the conservation of natural habitats and preservation of Margallah Hills National Park (MHNP), it is essential to remove alien invasive species and replace them with indigenous plants. In MHNP, indigenous plant species face significant competition from invasive

species, which release chemicals into the soil that deteriorate the hyphae of native plant roots and inhibit the regeneration of new saplings.

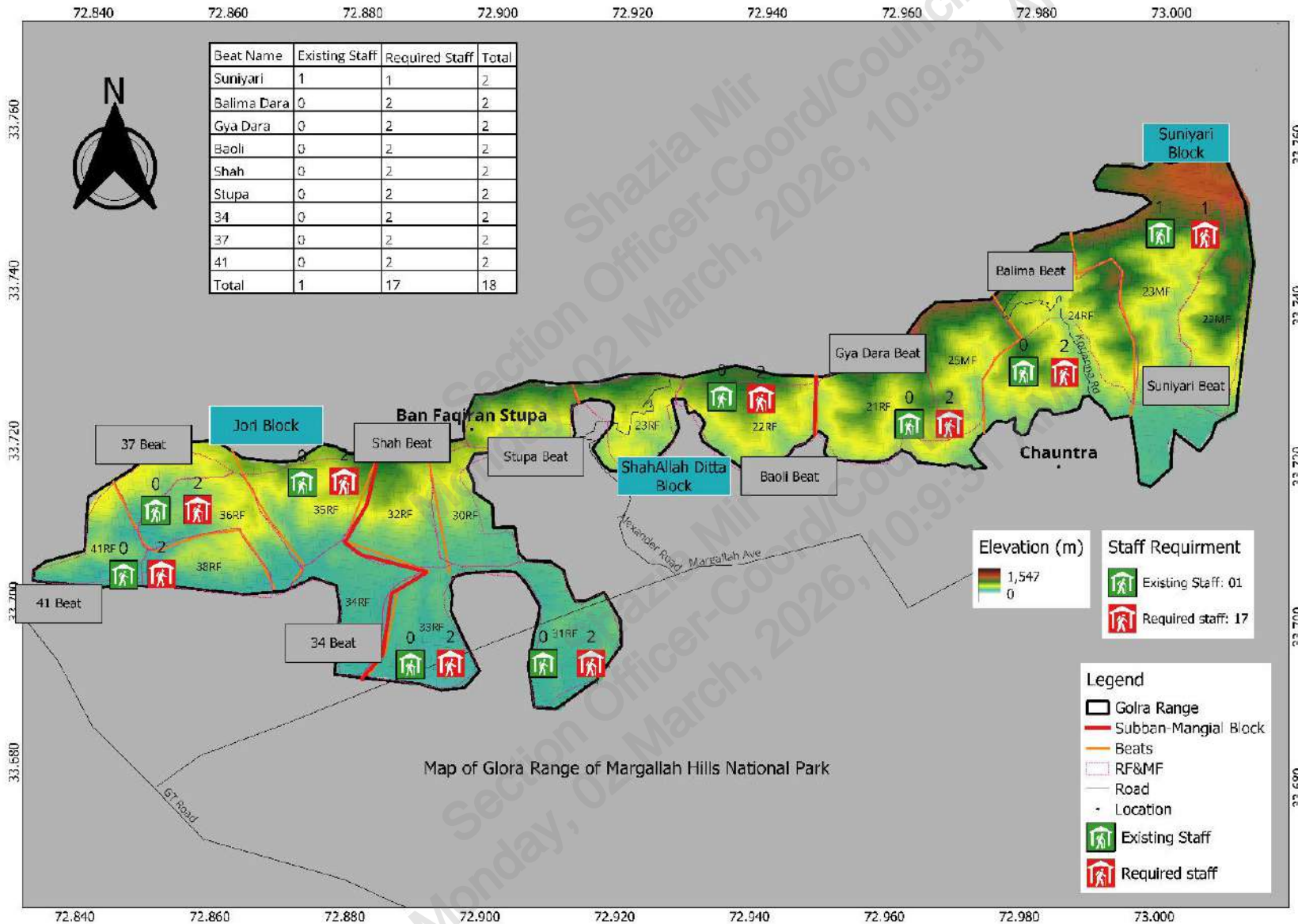
In this regard, IWMB, in collaboration with Friends of Margallah Hills National Park (FoMHNP), launched the “Margallah Healing Project”. As part of this initiative, Lantana camara was uprooted in Dhoke Jeevan Valley, and cleared patches of land were replanted with indigenous vegetation. Additionally, 350 mature plants were planted in the Monal area during the plantation activity to restore and enhance the natural habitat of MHNP.

5.1.7 Visitor Management and Responsible Tourism in MHNP

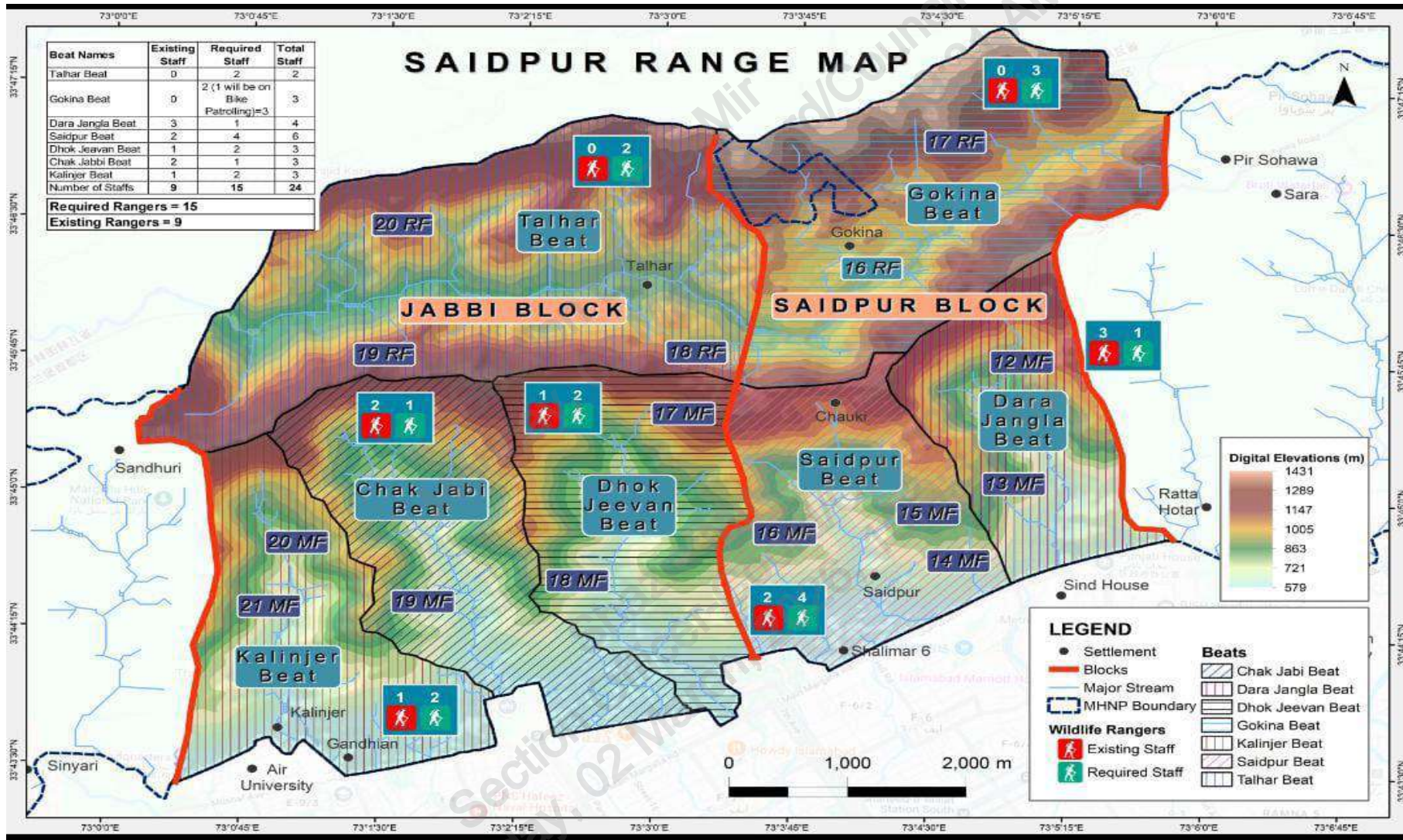
Visitor management is a key component of wildlife conservation in Margallah Hills National Park (MHNP), as tourist pressure on trails continues to increase. The IWMB Visitors’ Management Team actively promotes responsible tourism to conserve and preserve the park’s natural beauty. Staffs are regularly deployed on trails to monitor visitors, clean trails, and control plastic pollution.

To raise awareness, visitors and tourists are engaged in protecting the park from litter, and strict rules are enforced, including prohibition of plastic bags and food in plastic packaging inside the trails. Weekly cleanup drives, conducted every Sunday with the participation of students and citizens, have significantly contributed to maintaining a litter-free environment. These efforts have helped cultivate a culture of environmental responsibility and ensured that MHNP remains a safe and clean habitat for its biodiversity.

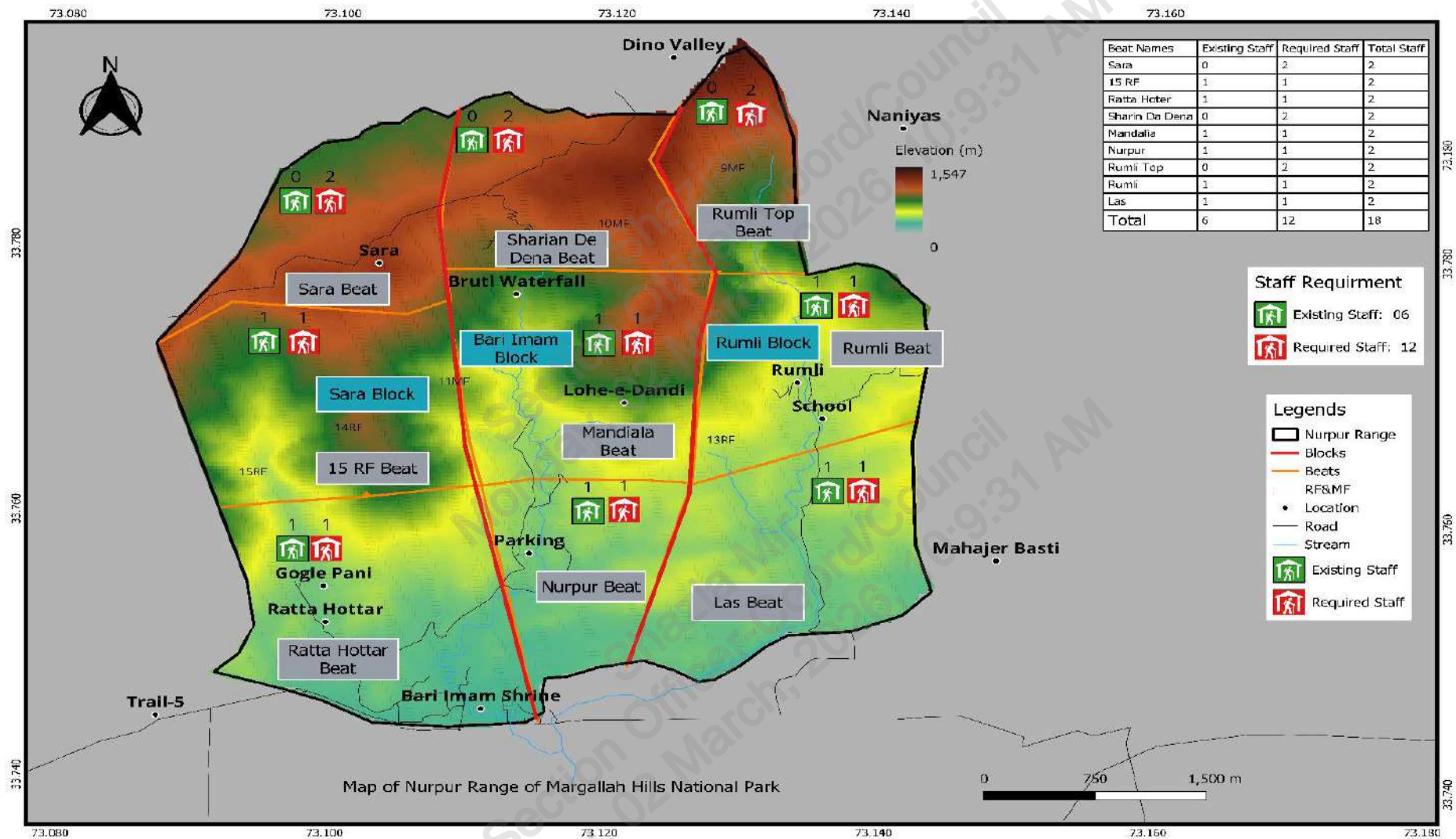
The Golra Range of Margallah Hills National Park



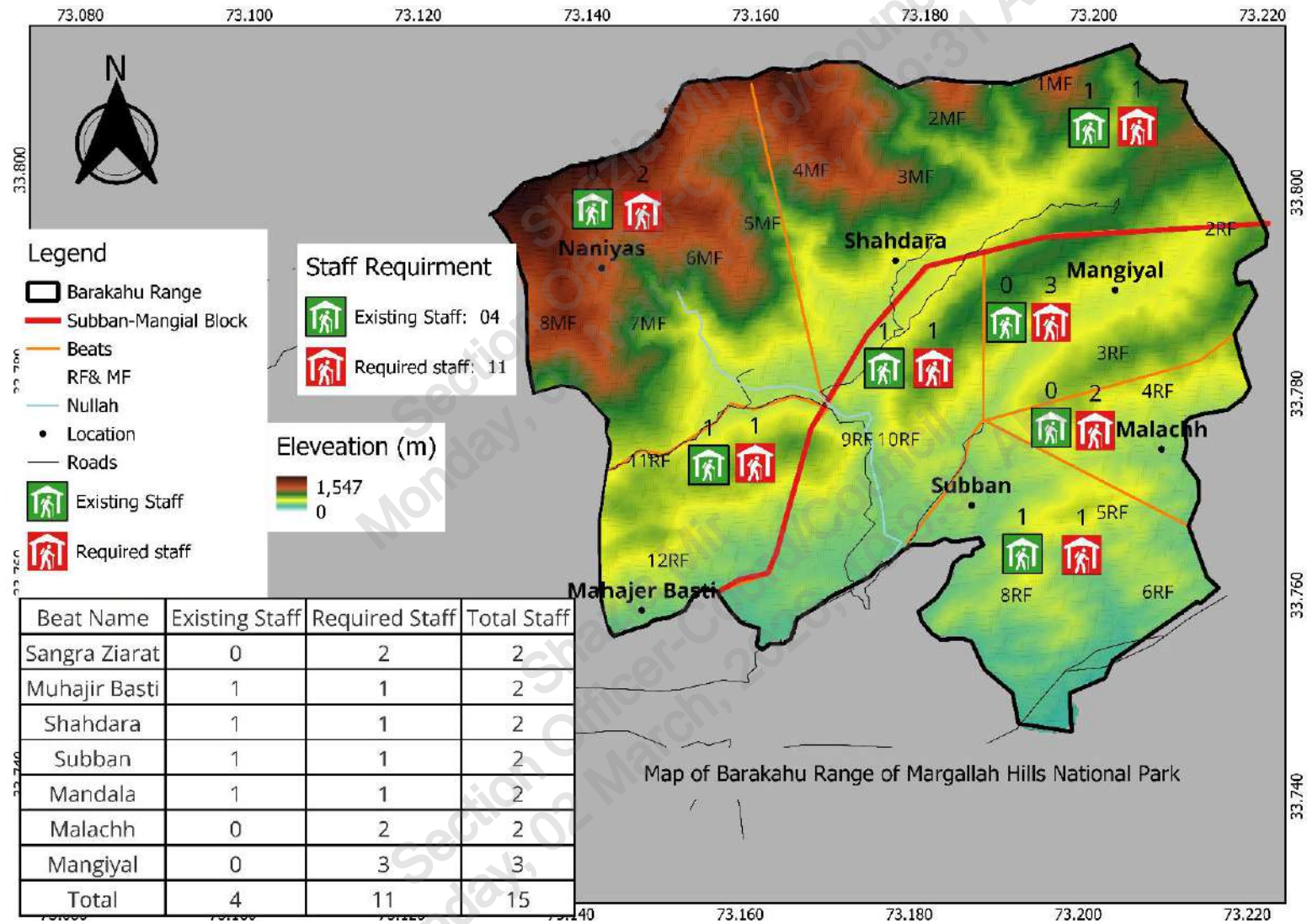
The Saidpur Range of Margallah Hills National Park



The Nurpur Range of Margallah Hills National Park



The Bahrakhu Range of Margallah Hills National Park





Protection activities in Margallah Hills National Park and ICT

Sr. No.	Village Name	Sr. No.	Village Name
1.	Nurpur Shahan	12.	Gandhain
2.	Gokina	13.	Saidpur
3.	Kainthala	14.	Sinyari
4.	Kot Jandan	15.	Pir Sohawa
5.	Rumli	16.	Lubana
6.	Talhar	17.	Subban
7.	Shadara	18.	Sara
8.	Mandla	19.	Kot Jandan
9.	Jouri Rajgan	20.	Ratta Hottar
10.	Nurpur Shahan	21.	Subban
11.	Kot Jandan	22.	

Disseminated the information about Fire season SOPs in local communities of Margallah Hills National Park, Islamabad.

5.2.1 Community Initiatives

Community Relations section, Islamabad Wildlife Management Board (IWMB) had issued guidelines to the local community members to collect Kachnaar (*Buhaina Variegata*) adopt sustainable practices for community based conservation.

5.2.2 Cleanup Drives and Community Service

The Community Relations Section conducted regular cleanup drives from July 2024 to June 2025 along Pir Sohawa Road, park trails, and surrounding community areas to promote a plastic-free Margallah Hills National Park. These activities involved students from FAST University and Bahria University as part of their community service programs.

Cleanup drives were organized weekly and, at times, twice a week, covering key tourist spots such as Daman-e-Koh, Chatri Point, Bodla Ban, Ridge Trail Point, and Trails 2, 3, 4, 5, and 7. These efforts not only helped reduce litter and plastic pollution but also raised awareness among visitors and local communities about the importance of preserving the park's natural environment.

5.2.3 Fire Awareness campaign in local Communities

The section developed the content on fire awareness for schools, communities, general public, Sops. The section initiated fire awareness campaign as listed in the table below, for fire awareness, protection, preservation, and conservation of the Margallah Hills National Park (MHNP). Disseminated the information about Fire season SOPs in local communities, Trails, School, general public and others.

Sr. No	Date	Activity	Area/Block/Range	Village
1	28-Apr-25	Fire awareness session at Govt. School	Golra Range	Sinyari
2	29-Apr-25	Fire awareness session at Govt. School	Saidpur	Saidpur
3	2-May-25	Fire awareness session in local community	Sinyari	Sinyari
4	6-May-25	Fire awareness session at Govt. School	Barakahu	Subban
5	6-May-25	Fire awareness session at Govt. School	Barakahu	Rumli
6	6-May-25	Fire awareness session at Govt. School	Golra Range (IMCB) School	Shah Allah Ditta
7	9-May-25	Fire awareness session in local community	Barakahu	Subban & Kot Hathiyaal
8	9-May-25	Fire awareness session in local community	Saidpur	Kalinjer
9	9-May-25	Fire awareness session at Govt. School	Barakahu	Shahdara
10	13-May-25	Fire awareness session Radio Station	Radio Station FM 92.4 Isb Police	-
11	14-May-25	Fire awareness session at Govt. School	Golra Range	Dhok Jouri Rajgan
12	14-May-25	Fire awareness session Radio Station	Radio Station PBC FM 94	-
13	15-May-25	Fire awareness session at Govt. School	Golra Range	Lubana
14	16-May-25	Fire awareness session in local community	Saidpur	Saidpur
15	16-May-25	Fire awareness session at Govt. School	Barakahu	Mandla
16	16-May-25	Fire awareness session in local community	Saidpur	Saidpur
17	20-May-25	Fire awareness session at Radio Station	FM 91.6 (DD Wildlife)	-
18	20-May-25	Fire awareness session at Govt. School	Kot Jandan	Kot Jandan
19	23-May-25	Fire awareness session in local community	Golra Range	Jouri Rajgan
20	26-May-25	Fire awareness session at Govt. School	Nurpur Shahan	Nurpur Shahan
21	30-May-25	Fire awareness session in local	Golra Range	Dhok

		community		Lubana
22	13-Jun-25	Fire awareness session in local community	Nurpur Shahan	Shahrarah
23	13-Jun-25	Fire awareness session in local community	Nurpur Shahan	Rumli
24	20-Jun-25	Fire awareness session in local community	Nurpur Shahan	Mandla

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5.2.4 Volunteer Activities

1. Awareness session were conducted in coordination with FoMHNP to hikers, public, institutes
2. Close coordination and liaison for removal of alien invasive specie

5.2.5 Celebration of International Days

1. Arranged World Migratory Bird Day at Trail 5 with the Volunteer group on 11 October 2024
2. Arranged world biodiversity day at Trail 5
3. Plantation drive at various sites of MHNP as trail 3, 4, 5 and inside villages

5.2.6 Miscellaneous Activities

- Engaged the 30 students of FAST university for community services in MHNP



مارگلہ ہلز نیشنل پارک میں ممکنہ آگ کے واقعات سے بچاؤ کی احتیاطی تدابیر

کرنے والے عمل

- ◆ گشت پے ماسور وائلڈ لائف ہیکار/سی ڈی اے کے عملے سے فوری طور پر رابطہ کریں اور جنگل میں لگی آگ کی اطلاع سی ڈی اے ہیلپ لائن 051-9262235 پر دیں۔
- ◆ آگ کی کسی بھی سرگرمی کے دوران بیچلے، پانی وغیرہ رکھیں۔
- ◆ کپڑوں میں آگ لگنے کی صورت میں فوری طور پر رک جائیں اور لباس کو تن سے جدا کر دیں۔
- ◆ آگ کے مقام سے پہلے ایک سے زیادہ نکلنے کے راستے کے منصوبے بنائیں۔
- ◆ چنگاریوں اور آگ سے بچاؤ کے حفاظتی لباس اور جوتے کو ترجیح دیں۔
- ◆ اگر آپ سڑک کے قریب ہیں تو سڑک کے ساتھ باہر یا کھائی میں لیٹ جائیں اور اپنے آپ کو مٹی یا گسی ایسی چیز سے ڈھانپنے کی کوشش کریں جو آپ کو گرمی یا آگ سے بچا سکے۔
- ◆ پودوں کے قریب راکھ کو مکمل طور پر بجھائیں، اور تسلی کر لیں کہ آگ مکمل طور پر بجھ چکی ہے۔

نہ کرنے والے عمل

- ◆ آگ کو کبھی بھی سلگتا ہوا نہ چھوڑیں۔
- ◆ تمباکو، سگریٹ یا آگ لگنے والی کوئی بھی اشیاء مکمل طور پر بجھائیں اور تسلی کر لیں کہ آگ مکمل طور پر بجھائے بغیر گاڑی یا موٹر سائیکل سے نہ چھینکیں۔
- ◆ جنگلات میں گرم ہواؤں کے دوران آتش گیر اشیاء کے استعمال سے پرہیز کریں۔
- ◆ جنگل میں کھلے آسمان تلے آگ کے استعمال والی سرگرمیوں سے پرہیز کریں۔
- ◆ آگ کے موسم میں مارگلہ ہلز نیشنل پارک میں کیسپنگ، باریبی کیو یا کسی بھی مقام پر کھانے پکانے وغیرہ کا اہتمام نہ کریں۔

اسلام آباد وائلڈ لائف مینجمنٹ بورڈ (اسٹا پارک ڈیولپمنٹ اتھارٹی) کو روڈ اسلام آباد

Precautionary measures during the fire season in MHNP

5.3 Information and Outreach

During the July, 2024 to June 2025, the Information and Outreach section of the Islamabad Wildlife Management Board (IWMB) played a central role in advancing the organization's mission of conservation through public education, stakeholder engagement, eco-tourism promotion, and inter-agency collaboration. The section implemented a wide range of outreach, media, and educational activities to strengthen community participation in the protection of the Margalla Hills National Park (MHNP) and its biodiversity.

5.3.1 Stakeholder Consultations

The department organized eleven stakeholder meetings as part of the Environmental and Social Impact Assessment (ESIA) process for the Margalla Viewpoint project. These consultations provided valuable feedback and helped ensure that the planned infrastructure development adhered to sustainable practices within protected zones. The participatory approach also enhanced coordination among relevant agencies and local stakeholders.

5.3.2 Website and Hosting Transition

A major digital milestone was achieved with the successful transition of IWMB's official website from Taiz Host to the official government domain, iwmb.gov.pk. Close coordination with the Cyber Wing ensured smooth activation of official email accounts, domain stabilization, and the full technical handover of digital infrastructure to IWMB's internal team. This transition strengthened IWMB's online visibility and operational independence.

5.3.3 Senate Standing Committee Visits

During the year, IWMB hosted two visits from the Senate Standing Committee. These visits were led by the Director and supported by the outreach team, who presented detailed briefings on IWMB's ongoing conservation efforts, challenges, and achievements. The visits fostered stronger institutional linkages and highlighted IWMB's commitment to transparent operations.

5.3.4 Fire Season Awareness Campaign

A large-scale fire prevention campaign was implemented during the dry season to reduce the risk of wildfires across the Margallah Hills National Park. The campaign included the installation of twenty-five fire safety signboards along major trails and the distribution of four thousand brochures to visitors and nearby communities. An SMD screen was also installed to display continuous digital safety messages, while six radio shows were aired on different platforms to spread fire prevention awareness. The campaign was planned and executed in coordination with Assistant Directors from multiple departments, ensuring effective outreach and impact.

5.3.5 Leopard Preserve Zone Awareness and Guided Tour

As part of its eco-tourism and education initiatives, IWMB conducted guided tours within the Leopard Preserve Zone. These tours educated visitors about leopard behavior, habitat ecology, and strategies for human-wildlife coexistence. Educational materials and informative signage were also placed along trails to promote responsible tourism and enhance visitor safety. Throughout the year, conducted fifty-four guided educational tours, attended by over four hundred and eighty-five participants, including students, researchers, diplomats, and tourists. These tours deepened public understanding of the Margallah Hills ecosystem, rare species, and the conservation challenges faced by IWMB. The guided experiences promoted environmental stewardship and fostered appreciation for Pakistan's natural heritage.

5.3.6 Ridge Trail Monitoring and Outreach

The department carried out regular monitoring of the Ridge Trail to maintain its cleanliness and ensure wildlife protection. Outreach staff and volunteers interacted directly with hikers, distributing awareness materials and promoting environmentally responsible practices. These ongoing efforts helped sustain the ecological health of the trail and improved visitor engagement.

5.3.7 Rescue and Rehabilitation Center Tours

Scheduled visits to the Rescue and Rehabilitation Center were organized for schools, universities, families, and foreign delegations. These visits provided participants with a firsthand understanding of IWMB's rescue operations, animal care procedures, and welfare protocols. The tours successfully showcased IWMB's commitment to ethical wildlife management and public transparency.

5.3.8 Training Sessions and Marathon Events

The department organized three environmental awareness and outdoor engagement events, which included nature walks, workshops, and conservation-themed marathons. Over one hundred and forty-five participants took part in these activities, contributing to greater public interest in environmental protection and sustainable outdoor recreation.

5.3.9 Education and Awareness Sessions

Eight education and awareness sessions were conducted in collaboration with organizations such as WWF, local schools, and foreign embassies. These sessions introduced participants to IWMB's mission, conservation challenges, and ongoing initiatives within the Margalla Hills National Park. The discussions strengthened institutional partnerships and expanded the reach of IWMB's educational programs.

5.3.10 Media Campaign

A comprehensive media campaign was launched to raise public awareness about the flora and fauna of the Margalla Hills National Park. The campaign featured five morning show appearances on HUM TV, PTV, Suno News, and ARY News, along with a special podcast highlighting IWMB's conservation and rescue efforts. Through these platforms, IWMB successfully reached a wide audience, promoting understanding of wildlife protection and the importance of conservation. The campaign's programs can be viewed through the following links: [HUM TV](#), [PTV](#), [Suno News](#), [ARY News](#), and [Podcast](#).

5.3.11 Social Media Activation and Management

In order to enhance digital outreach, official IWMB social media accounts were created and activated on TikTok, Facebook, Instagram, and Twitter (X). The outreach team now manages these platforms on a daily basis, ensuring regular updates, audience engagement, and consistent messaging on wildlife conservation and IWMB activities. This digital presence has substantially increased public engagement and information dissemination.

5.3.12 Official Visits and Delegations

Several high-profile visits and delegations were received during the year, including the Federal Minister, members of the Islamabad United cricket team, and representatives from foreign embassies, universities, NGOs, and media organizations. These visits helped build stronger partnerships, raise the profile of IWMB, and encourage collaborative efforts in wildlife conservation and environmental awareness.

5.3.13 Market Engagement Activities

IWMB actively participated in community events and local markets to strengthen its connection with the public. The department took part in twenty farmer markets, two eco markets, and one maker bazaar, totaling twenty-three outreach events. Through these activities, IWMB showcased eco-friendly products, operated wildlife awareness booths, and conducted volunteer recruitment and educational drives, reinforcing its role as a leader in community-based conservation.

In total, this section organized eighty-eight structured activities during the reporting period, engaging more than six hundred and thirty participants, excluding open public events. These included guided tours, training and marathon events, and educational sessions in partnership with organizations such as WWF, schools, and embassies.



Asian black bear rescued, treated in capital

ISLAMABAD: The Islamabad Wildlife Management Board (IWMB) and global animal welfare organisation Four Paws rescued a three-year-old Asian black bear from the cruel dancing bear trade in Jhang.

Sunny was confiscated by local wildlife authorities in critical condition, showing severe signs of abuse and neglect. The bear was immediately provided with emergency medical care before being relocated to the IWMB Rescue and Rehabilitation Centre.

A veterinary examination revealed that Sunny's teeth had been forcibly removed, a common and inhumane practice in the dancing bear trade, rendering her defenceless. She was also found to be emaciated and displaying signs of extreme anxiety.

"We are proud to have rescued Sunny and brought her to safety," said Dr Amir Khalil, a veterinarian with Four Paws who led the emergency mission in Pakistan.

"The removal of the ring from her nose symbolises a significant moment - it was her last dance. Sunny is now officially retired."

This rescue was part of Four Paws' ongoing collaboration with the government to eradicate the cruel exploitation of bears for entertainment purposes, including dancing and baiting.

IWMB Chairperson Aisha Humera expressed gratitude to international organisations for their support in rescue operations. She said IWMB Rescue and Rehabilitation Centre served as a sanctuary for rescued animals, providing them with a safe and nurturing environment for recovery and rehabilitation.

Musadik praises IWMB for rehabilitating injured black bear

ISLAMABAD: Minister for Climate Change and Environmental Coordination Musadik Masood Malik on Tuesday commended the Islamabad Wildlife Management Board (IWMB) for its successful rescue and rehabilitation of a seven-year-old Asian black bear who was subjected to severe cruelty.

The Ministry of Climate Change said that the tragic ordeal of the bear named Rocky came to light after a viral video exposed his harrowing condition. Forced into 35 brutal dog fights in Sargodha, he was left with a shattered jaw, unable to eat and suffering from severe injuries. The IWMB, in collaboration with Four Paws International, led a swift rescue mission, ensuring Rocky's safe rehabilitation.

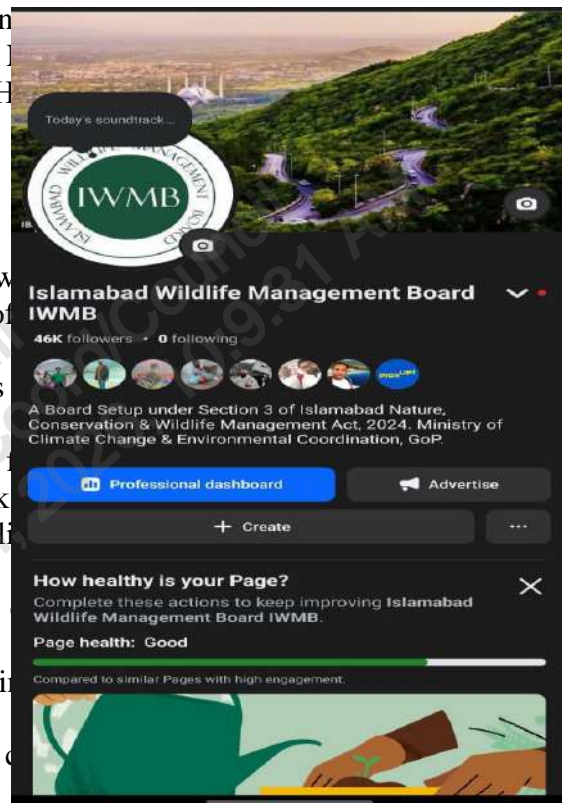
Following a request from the Punjab Wildlife Department, IWMB and Four Paws International intervened, sedating and transporting Rocky to the IWMB Rescue and Rehabilitation Centre in Islamabad.

There, he received urgent medical treatment, including wound stitching, neutering and microchipping for identification. In a significant milestone, Rocky was successfully relocated to a spacious new enclosure on Tuesday.

Federal Minister Musadik Masood Malik, who attended the handover ceremony, praised the IWMB's efforts and reaffirmed the government's commitment to wildlife protection.

"Rocky's rescue highlights our resolve to protect Pakistan's wildlife," said Minister Malik adding that, "we commend the relentless work of IWMB and assure the nation that firm steps are being taken to prevent such cruelty, strengthen wildlife laws and safeguard endangered species like the Asian Black Bear."

wild carnivore species in MHNP.



Media coverage and social media pages of IWMB were used to showcase activities in Margalla Hills National Park (MHNP).

5.4.3 International Conferences and Congress

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Two research abstract presented during International Zoological Congress, 2025 with following titles;

1. From vagrant to resident: Co-existence of leopard with human-influenced landscape in the Margallah Hills Range of Himalayan foothills Muhammad Saeed, Sakhawat Ali International Congress of Zoology, Pakistan. (Presented by Dr. Muhammad Saeed)
2. Human-Leopard Conflict and Its Mitigation Through Awareness and Capacity Building of Frontline Stakeholder Sakhawat Ali, Muhammad Saeed, Muhammad Abbas, Zakir Ali. Ali International Congress of Zoology, Pakistan. (Presented by Sakhawat Ali).

5.4.4 Publications

1. Junaid, A., & **Saeed, M.** (2025). Biodiversity research in Murree-Kotli Sattian-Kahuta National Park, Punjab, Pakistan: A systematic review. *Biharean Biologist*, 19, 57–71
2. Ahmed, W., Rais, M., Akram, A., **Saeed, M.**, Luqman, Gill, S., ... & Hadi Sr, A. (2024). Movement of amphibians in a habitat mosaic of agriculture landscape. *European Journal of Wildlife Research*, 70(6), 108.
3. Fozia B., M. Altaf, S. Batool, M. S. H. Khan, A. H. Narejo, A. Iftakhar, S. M. Bashir, A. Hadi and **Sakhawat Ali**. 2025. Diversity and Ecology of Birds from selected Sites of Islamabad, Pakistan. *Journal of Wildlife and Ecology* (2025). 9(2):101-130.
4. Kiran Sahar, Shahzad Aslam, **Sakhawat Ali**, Ahmar Riaz, Ghulam Murtaza and Zahid Baig Mirza. 2024. Exploring Soil Invertebrate Responses to Forest Fires in Margalla Hills National Park (MHNP), Islamabad: An Inquiry into Survival Strategies beneath the Ash. *Journal of Environment and Ecology* ISSN 2157-6092 2024, Vol. 15, No. 1.

5.4.5 Technical Research Reports

1. Enlistment of sewage and waste management of restaurants within Margallah Hills National Park
2. Land Use and Land Cover of Margallah Hills National Park
3. Fire Season 2025 in Margallah Hills National Park
4. Trail Camera Deployment for Monitoring Leopards to Mitigate Human–Leopard Conflicts at Defense Complex Islamabad
5. Ecological Baseline Study of Monal and La Montana Sites for Environmental Impact Assessment (EIA)
6. Damage Assessment of Nurpur and Bhara Kahu Ranges of Margallah Hills National Park

5.4.6 Project Proposals

1. Conserve the biological diversity and manage the landscape of Margalla hills national park and its buffer zones on international standards at Green Pakistan MoCC & EC, Islamabad.

5.4.7 Collaboration with Academia

The Research and Planning Section collaborates with the following academic institutions to conduct research activities in Margalla Hills National Park.

1. Collaboration with COMSATS University, Islamabad. Assessment of zoonotic disease prevalent from carnivore scats in Margallah Hills National Park. A collaborative one health research project by Comsat University and French Institution.
2. Letter of understanding between Islamabad Wildlife Management Board (IWMB) and National University of Technology, Islamabad, Pakistan for the research project titled “ICT appliCaTions for sustainable environmental protection (ACTIVE)” funded by the European

Union at National University of Technology (NUTECH). In this collaboration NUTECH installed a weather station at trail-5 visitor's information center, MHNP, Islamabad.

3. Collaboration with SZABIST University, Islamabad for wildlife smart monitoring system. This project helps to use advance technology like camera traps and AI tool for early warning system of leopard.

5.4.8 Training and Capacity Buildings

The following training and capacity-building programs have been organized to enhance the skills of the existing IWMB officials;

1. Data Collection Techniques workshop for IWMB field staff, to collect digitally data at the IWMB conference room, Islamabad.
2. SMART app training for efficient patrolling of wildlife ranges in MHNP with the support of WWF-Pak.

5.4.9 Internship Program for Young Scientist

The Internship Program 2025 for university students was conducted over an eight-week period and targeted individuals with a strong academic interest in wildlife and environmental studies. The program was designed to provide participants with practical exposure and hands-on experience in various aspects of wildlife management and conservation.

Throughout the internship, students were engaged in a range of field and office-based activities under the supervision of different sections within the Islamabad Wildlife Management Board (IWMB). This experience not only enhanced their academic understanding but also allowed them to actively contribute to IWMB's ongoing conservation initiatives.

The successful completion of the program represents a meaningful step toward nurturing the next generation of professionals committed to wildlife protection and sustainable environmental management.

5.5 Rescue and Rehabilitation

In line with a ruling from the Islamabad High Court in case W.P. 1155/2019, which stated that "*The Board shall ensure and take appropriate measures to enforce the provisions of the Wildlife Ordinance 1979 and the Act of 1890 so that no animal is treated in a manner that subjects it to unnecessary pain and suffering,*" the IWMB held its 37th board meeting on 10th August, 2021. During this meeting, it was decided that the IWMB will proceed with establishing a Black Bear Rescue Centre at the old Islamabad Zoo.

This center will be the only wildlife rescue service of its kind in Pakistan, dedicated to assisting all species of animals in distress. The Islamabad Wildlife Management Board (IWMB) specifically focuses on wild animals, both indigenous and exotic; those have been treated inhumanely, are orphaned, or are injured. This aligns with the Islamabad High Court order in judgment W.P. 1155/2019, which states that "*no animal should be treated in a manner that subjects it to unnecessary pain and suffering.*" According to Section 3 of the Prevention of Cruelty to Animals Act of 1890, it is unlawful for any person to beat or otherwise treat any animal in a way that causes unnecessary pain or suffering.

The Islamabad Wildlife Management Board (IWMB) is dedicated to caring for abused, injured, and orphaned wildlife species. Black bears are facing serious threats in their natural habitat; often, their mothers are killed, and the cubs are poached and sold in illegal wildlife markets. Since 2021, the IWMB has successfully rescued four cubs that were suffering from severe trauma and stress and required special care.

IWMB officials received specialized training from Four Paws International at Al Ma'wa for Nature and Wildlife, Jordan which was established to provide regional solutions for rescued wildlife especially bears. This training has been instrumental in helping the cubs recover from their trauma and stress. Now, these bears are able to live peacefully at the IWMB rescue and rehabilitation center.

5.5.1 Black Bears Rehabilitated at IWMB Rescue Center

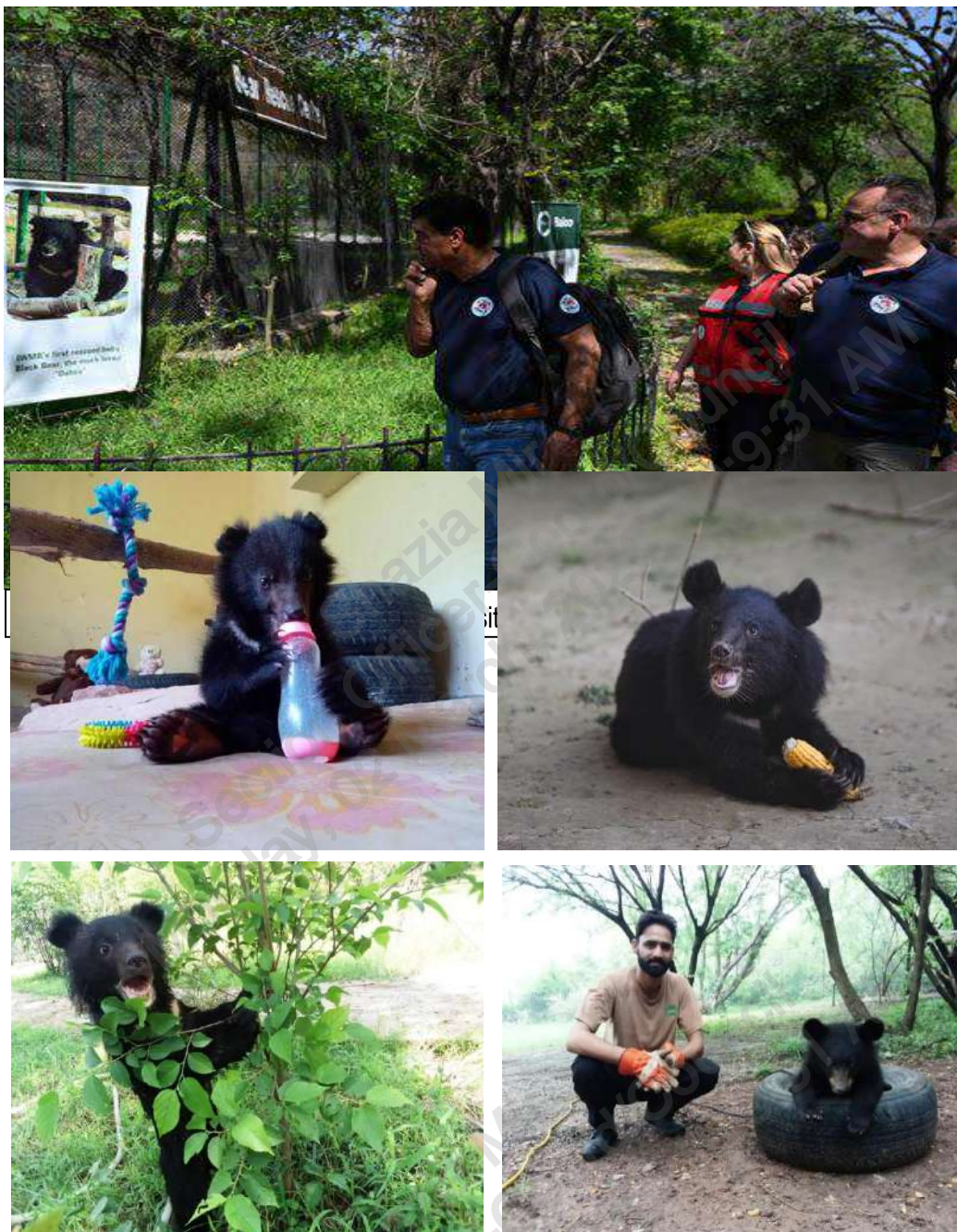
The detail of these bears cubs given below:

Sr. No.	Name of Bears	Gender	Date of Rescue	Age at time of rescue	Rescued Location
01	Daboo	Male (♂)	03-06-2021	3 Months	Rawalpindi
02	Baloo	Male (♂)	20-07-2021	6 Months	Gujranwala
03.	Makra	Male (♂)	26-04-2022	2 Months	AJ&K
04.	Teddy	Male (♂)	06-09-2023	6 Month	Rawalpindi
05.	Ladoo	Male (♂)	18-12-2021	5 Years	Lahore Zoo
06.	Barfi	Female (♀)	15-09-2022	4 Years	Gujar Khan, RWP

07.	Cukoo	Male (♂)	14-10-2022	5 Years	Gujranwala
08.	Anila	Female (♀)	27-03-2024	4 Years	Gujranwala
09.	Bughie	Male (♂)	09-04-2024	7 Years	Khushab
10.	Laila	Female (♀)	09-04-2024	7 Years	Khushab
11.	Heer	Female (♀)	22-04-2024	2 Years	Jhang
12.	Rocky	Male (♂)	01-03-2025	6 Years	Sargodha
13.	Sunny	Female (♀)	03-03-2025	3 Years	Jhang
14.	Bantoo	Male (♂)	09-04-2025	6 Years	Layyah
15.	Jannu	Male (♂)	01-05-2025	4 Years	DG Khan
16.	Mannu	Male (♂)	01-05-2025	4.5 Years	DG Khan
17.	Sweetie	Female (♀)	04-06-2025	4 Years	Sargodha
18.	Boxer	Male (♂)	27-07-2025	4 Years	Sargodha

Each bear has a similar history of trauma and stress from being poached in the wild, and helping them overcome this trauma is a challenge for their caretakers as well. To address this, the IWMB collaborated with Four Paws International to provide enrichment, feeding, and care for these bears according to international standards.

In April 2024, the Four Paws International team examined the bear cubs, conducted health checks, and micro-chipped them. They also trained IWMB officials on how to care for the bears at the IWMB rescue center.



Bear cubs undergoing rehabilitation with trained staff at the IWMB Rescue Center.

5.5.2 Success Stories of IWMB Rescue and Rehabilitation Centre

1. Rehabilitation of Black Bears:

The Islamabad Wildlife Management Board (IWMB) has successfully rehabilitated eleven (11) black bears, including four (4) cubs, in a stress-free environment. The international team from Four Paws visited to inspect the bears and provided valuable feedback to the IWMB's rescue and rehabilitation team. The bears are fed a specially prepared diet that includes fruits, vegetables, dried

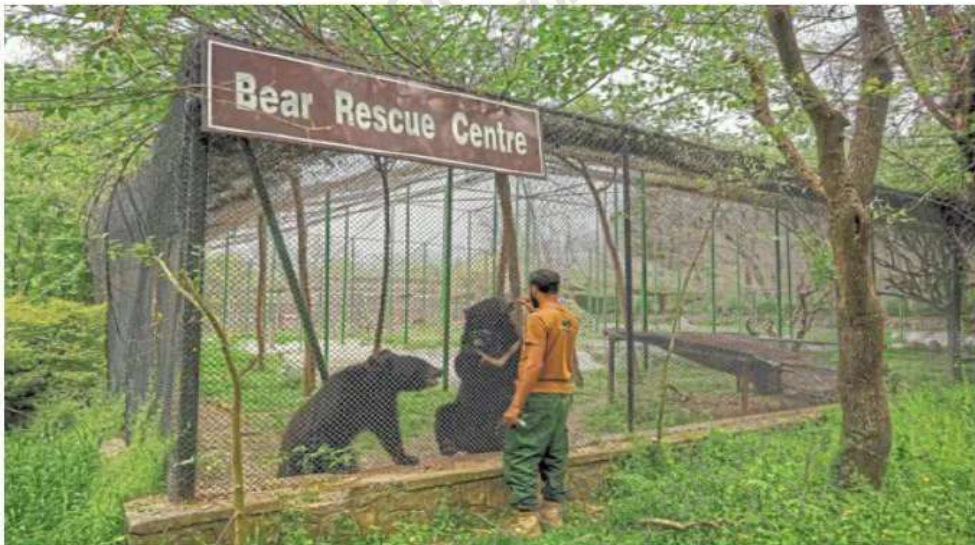
fruits, milk, honey, and special chapattis, ensuring their dietary needs are met as they would be in the wild.



Rescued & Rehabilitated Bear Cub (Daboo)



Diet of Rescued Bear



In good hands: A wildlife ranger taking care of rescued Asian black bears at the Margallah Wildlife Rescue Centre, formerly a zoological park, in Islamabad. — AFP

2. Rehabilitation of Bengal Tiger:

In another successful case, IWMB rehabilitated a Bengal tiger that had suffered seven broken bones and was unable to walk due to osteomalacia. After three months of specialized care, the tiger cub regained the ability to walk. Since there are no big cat sanctuaries in Pakistan, the Ministry of Climate Change arranged for the tiger to be relocated to South Africa to enjoy a peaceful retirement.



Rescued Bengal Tiger at the IWMB Rescue Center Relocated to a Sanctuary in South Africa.

IWMB also rehabilitated an injured common leopard that was rescued from Muzaffarabad, AJ&K in July 2024. After spending seven weeks at the rescue center, this female leopard was successfully released back into her natural habitat.



IWMB Rescue Center successfully rehabilitated an injured common Leopard from AJK and returned her into wild habitat in August 2024



The mission of the Islamabad Wildlife Management Board rescue and rehabilitation center is clear: they strive to avoid housing animals in the rescue center whenever possible. Instead, they aim to release wildlife back into their natural habitats, and if an animal is unable to survive in the wild, they work to relocate it to a sanctuary after rehabilitation.

5.5.3 Future Plans of IWMB Rescue and Rehabilitation Centre

IWMB collaborate with the Free the Wild International organization to establish a bear sanctuary that meets international standards. This sanctuary will provide a near-natural habitat where bears can live free from pain and suffering. The vision is to create an environment that closely resembles their natural surroundings, allowing them to exhibit natural behaviors and lead fulfilling lives.

The sanctuary will include spacious enclosures with access to natural vegetation, water bodies, and enrichment activities designed to stimulate their instincts. Additionally, the facility will prioritize the physical and mental well-being of the bears, offering veterinary care, nutritious diets, and opportunities for socialization.

IWMB aims to not only rehabilitate and house rescued bears but also to raise awareness about the importance of wildlife conservation and the cruelty associated with bear baiting and dancing. By partnering with Free the Wild, IWMB hopes to set a precedent for animal welfare in the region and inspire similar initiatives for other wildlife species. Ultimately, this sanctuary will serve as a safe haven for bears, ensuring they can live their lives in peace and dignity.

Pakistan Climate Change Authority (PCCA):-

The Pakistan Climate Change Authority (PCCA) was established under Section 5 of the Pakistan Climate Change Act, 2017. The Authority composition includes, Chairperson, Member Adaptation, Member Mitigation, Member Climate Finance and Member Coordination and one Member from each province to be nominated by the respective provincial Ministers-in-charge. So far, Member (Coordination), Member (Climate Finance) and Member (Mitigation) have been appointed, whereas the hiring of Chairperson and Member (Adaptation) is in process.

The provinces of Punjab, Sindh, Balochistan and Khyber-Pakhtunkhwa have nominated their respective ex officio provincial Members of the Authority as follows:

1. Secretary, Environment, Climate Change and Coastal Development, Sindh
2. Secretary, Environment Protection Department, Punjab.
3. Vice Chancellor, University of Balochistan
4. Faisal Amin Gandapur, Member National Assembly (KP).

The Secretary, Forest, Wildlife and Environment GB, and Director, EPA AJK have joined as the co-opted Members. The PCCA office has been established in Islamabad.

ROLE & FUNCTIONS

Technical Support	Coordination, Monitoring & Reporting	Climate Finance
<ul style="list-style-type: none"> ▪ Formulation & implementation of climate-related policy, plans, and strategies. ▪ Policy advice and support for the implementation of conventions, treaties and agreements 	<ul style="list-style-type: none"> ▪ Coordinate and monitor national/Provincial implementation of climate policies, plans, projects, etc. ▪ Submit the Annual National Climate Change Report to the Pakistan Climate Change Council (chaired by the Prime Minister). 	<ul style="list-style-type: none"> ▪ Support the formulation of bankable climate mitigation and adaptation projects in collaboration with relevant stakeholders. ▪ Manage Pakistan Climate Change Fund. ▪ Build partnerships with private sector and donors

Five meetings of the Authority have been held so far, on 04 October, 17 October, 2024 and 05 December, 2024, 20 March, 2025 and 18 June 2025 since its constitution. The sixth meeting is scheduled for mid-September 2025. During these meetings, national and provincial policies and priorities and actions were discussed, including the establishment of the Pakistan Climate Change Fund and the Fund Rules.

Sectoral Working Groups have been notified by the provinces of Punjab, Sindh, KP and GB as per one of the decisions held during the Authority meetings. The constitution of Sectoral Working Groups in Balochistan and AJK is under progress. The Sectoral Groups have been tasked to take stock of climate progress, identify future priorities and develop project concepts.

GOALS & TARGETS

- 26 concept notes were prepared and submitted to the Catalytic Fund of FCDO-funded Water Resource Accountability (WRAP) project in coordination with the provincial members and other development partners. Of these, one project has been approved for funding.
- A proposal for Technical Assistance for the preparation of the Country Package of Pakistan for Forests, Climate was approved by the Forest Climate Leader Partnership.
- Funding support has been secured from WaterAid for the preparation of the CR-WASH Finance Strategy and Action Plan.
- A proposal concept for accessing finance under the Loss & Damage Fund is under preparation, keeping in view the recent climate-induced flooding.
- Under Section 12 of the Pakistan Climate Change Act a Fund is to be established and managed by the Authority to mobilize financial resources for climate adaptation and mitigation actions in the country.

ACTIVITIES & ACHIEVEMENTS

- Established PCCA office in Islamabad.
- Representation of PCCA in COP29 held in Baku.
- Technical input to various negotiation streams of COP.
- Draft Service Regulations have been prepared to effectively operationalize the PCCA Office, which has been vetted by the Establishment Division on 07-05-2025. Currently, these are pending with the Finance Division for vetting.
- Coordination with Provincial Members to notify provincial working groups.
- Facilitating Group consultations for the preparation of the National Climate Finance Strategy.
- Sectoral Plan preparation.
- Input of PCCA on Green Taxonomy.
- Preparation of the Climate Research Action Plan has been initiated to undertake coordinated climate research on emerging climate issues.
- Established a partnership with WaterAid for the preparation of the CR-Wash Finance Strategy.
- Initiated process for joining the International Climate Councils Network (ICCN). PCCA has been granted observer status.





Government of Pakistan

Ministry of Climate Change & Environmental Coordination