YEAR BOOK

2020-21

Government of Pakistan
Ministry of Climate Change
Islamabad

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FOREWORD

Climate Change Division is mandated to perform functions on National policy, plans strategies and programmes with regard to disaster management including environmental protection, preservation, pollution, ecology, forestry, wildlife, biodiversity, climate change and desertification.

Climate Change Division is also mandated for 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 are also mandates of Climate Change Division.

In pursuance of Rule 25 (2) of the Rules of Business, 1973, I present the Year Book 2020-2021 which gives highlights of the policies, formulated directly by this Division or through its supporting organizations. It also contains a gist of the major activities and milestones achieved by Climate Change Division during the calendar year.

The audience of this Year Book is government officials, academia and general public having a keen interest in activities of Climate Change. Feedback in the form of comment(s) and suggestion(s) is welcomed for improvement.

(Capt (Retd) Sikander Qayyum)
Secretary
Ministry of Climate Change

FUNCTIONS OF CLIMATE CHANGE DIVISION

Under the Rules of Business, 1973 as amended from time to time, Climate Change Division is assigned with the following functions:

1. Omitted vide SRO 793 (1)/2018 (F.No.4-1/2018-Min-I) dated 25-06-2018.

2. Pakistan Environmental Protection Council.

3. Pakistan Environmental Protection Agency.

4. Global Environmental Impact Study Centre, Islamabad. (Global Change Impact Studies Centre, Islamabad).

5. National policy, plans strategies and programmes with regard to disaster management including environmental protection, preservation, pollution, ecology, forestry, wildlife, biodiversity, climate change and desertification.

6. Coordination, monitoring and implementation of environmental agreements with other countries, international agencies and forums.

7. Policy formulation, coordination and reporting of human settlements including urban water supply, sewerage and drainage.

8. Islamabad Wildlife Management Board.

ORGANIZATIONAL SETUP

Business allocated to the Climate Change Division has been distributed amongst the following Wings:-

i. **ADMINISTRATION WING**
ii. **ENVIRONMENT & CLIMATE CHANGE WING**
iii. **FORESTRY WING**
iv. **INTERNATIONAL COOPERATION (IC) WING**
v. **DEVELOPMENT WING**

ADMINISTRATION WING

i). **Strength & Responsibilities:-**

Total strength of the Climate Change Division during year 2020-21 under report is 192 employees (52 officers and 140 staff members).

The Administration Wing is headed by a Joint Secretary of this Division. The responsibilities of the Administration Wing are as under:-

a. Personnel Administration of the officers / officials of the Division.
b. Personnel administration of officers of the attached departments/organizations / projects.
c. Budgetary (non-development) and financial matters of the Division and its attached department/organizations.
d. Coordination between wings of this Division and with other Ministries/Divisions.
e. Matters relating to hiring of residential accommodation.
f. Re-imbursement of medical charges to the serving / retired officers.
g. Maintenance of PER record of all employees of this Division and attached departments and maintenance of annual declaration of assets.
h. Processing promotion, pay and pension cases of the officers / officials of the Ministry and its attached departments.
i. Trainings, conferences, seminars and visits abroad.

ii). **Reforms to be included:-**

E-Office is the need of the hour. Ministry of Climate Change (MoCC) is effectively implementing E-office application in the main Ministry with the support of Ministry of Information Technology (MoIT). Network infrastructure has been deployed and all wings of the Ministry are using E-Office in order to bring efficiency, effectiveness and transparency.

iii). **Creation of the post of Technical Advisor**

The post of Technical Advisor has been created to support M/o Climate Change in technical nature i.e. various multilateral environmental conventions including climate change, biodiversity, desertification, chemicals etc.

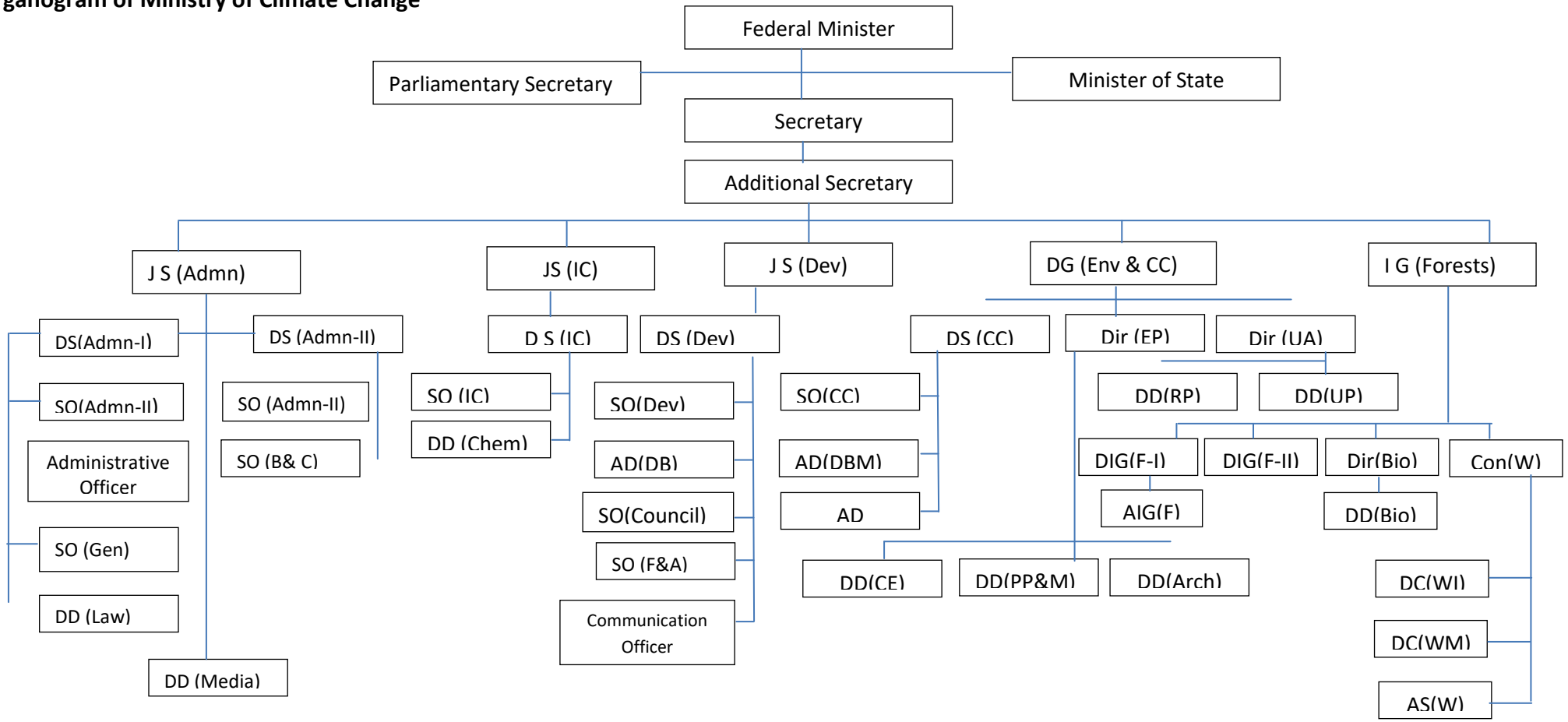
iv). **Recruitment of vacant posts:-**

Recruitment of nineteen vacant ministerial posts have been completed. These appointments have been made for the first time since creation of the M/o Climate Change.

v). **Promotions of officials**

Promotion cases of all the staff/officials of M/o Climate Change have been completed.

Organogram of Ministry of Climate Change



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ENVIRONMENT & CLIMATE CHANGE WING

Environment and Climate Change Wing of the Ministry is mandated to perform following functions: -

- Implementation of National Climate Change Policy and its implementation framework;
- Implementation of Environment Policy;
- Sustainable Urbanization;
- Water Sanitation and Hygiene (WASH)
- It also deals with: United Nation Framework Convention on Climate Change (UNFCCC), Inter-Governmental Panel on Climate Change (IPCC), United Nation Environment (UNE), UNICEF, South Asia Cooperative Environment Programme (SACEP) and Shanghai Cooperation Organization (SCO)

2. Pakistan is considered one of the low global greenhouse gases (GHG) emitter. Presently, Pakistan's GHG emission accounts for less than one percent however, the country is considered extremely vulnerable to the impacts of climate change. Being a responsible member of the global community, Pakistan has responded with well-articulated climate change agenda, consisting of the following initiatives: -

Climate Change Section

Google proposed a collaboration to showcase the Ministry of Climate Change's Ten Billion Trees Programme via Google Arts & Culture. With the project Google aims to bring together organizations from across the world to share their expertise, along with stories about forests and trees. Google Arts & Culture builds free tools and technologies for the cultural sector to showcase and share their gems, making them more widely accessible to a global audience. Google Arts & Culture provides technology support to over 2,000 cultural institutions in 80 countries, with more than 200,000 high-resolution images of original artworks, 6 million archival artefacts, 360^{o} virtual museum views, and more than 10,000 online exhibitions curated by experts.

In this regard the document has been signed, between MoCC and Google and the dashboard for MoCC has also been created. Now, MoCC will be able to upload content, pictures and videos relating to different initiatives of MoCC.

Formulation of Pakistan's Updated Nationally Determined Contributions (NDC's)

The Climate Change section of Ministry of Climate Change has successfully organized meeting of the steering committee for formulation of NDC's 2021 document. CC Section has made its efforts for making NDC's comprehensive document which is a statement of climate vision and the direction of our national policies and actions. The updated NDCs document of Pakistan is much more comprehensive as compared to

the 2016 NDCs document and focuses on the Prime Minister's Vision for Climate Change, and, Pakistan is ambitious to further reduce its emissions.

Natural Capital Accounting

The Prime Minister Imran Khan's aide Malik Amin Aslam and the British Higher Commissioner in Pakistan Dr Christian Turner mutually signed an Agreement on natural capital accounting. Natural capital is often undervalued or neglected in decision-making, which contributes to more biodiversity loss, and ultimately impacts human well-being. For example, infrastructure and road development projects have historically been carried out with little to no attention to the short-or long-term impact of these activities on natural ecosystems and biodiversity which sustainable use of the natural capital, which actually provides the foundation for sustainability of the life on earth and overall socioeconomic development of current and future generations, is vital to its sustainability for generating ecosystem services for the lasting human well-being.

The support on Natural Capital Accounting (NCA)' between the British High Commission Islamabad, UK Statistics Authority and the Ministry of Climate Change will help make the planet livable for humans, and include carbon sequestration of forests and the moderation of extreme events such as the role of mangroves in flood and storm surge mitigation.

E-Vehicle Policy

The Prime Minister's Committee on Climate Change during its meeting held on May 17, 2019 approved the minimum mandatory electric vehicle (EV) penetration targets and tasked the Ministry of Climate Change (MoCC) to develop the National Electric Vehicle Policy. After extensive consultations, the draft National Electric Vehicle Policy was firmed up and placed before the Cabinet for approval. The same was approved in principle by the Cabinet in its meeting dated November 5, 2019.

This initiative reflects net benefits in the range of US$ 2.2 billion to US$ 3.7 billion as net saving in oil bills to the country under different scenarios in the 2020 to 2030 time period. Additionally, there are benefits on account of job opportunities to a number of 35000-40000 reduction in emissions and air pollution/smog; associated health benefits; and the larger economic benefits of establishment of local manufacturing facilities. This is a flagship initiative of Government of Pakistan to address climate change aligned 30% of Electric Vehicles to be on road by 2030.

Engagement with UN-Habitat

UN-Habitat is the United Nations programme working towards a better urban future. Its mission is to promote socially and environmentally sustainable human settlements development and the achievement of adequate shelter for all. Pakistan is founding member of UN-Habitat and contributes US$ 6000 yearly to the Core Budget of UN-Habitat.

The Government of Pakistan is keen on taking measures to formulate the first Pakistan Resilient Urban Policy Framework. The Government of Pakistan is taking a participatory approach where the projects on urbanization are being revitalized to guide government in shaping the guiding principle for proper implementation Urban Policy Framework. Meeting challenges in the ***'New Urban Agenda'*** requires a paradigm shift in the approaches to development not only in Pakistan but in the world at large. The dialogue will also be part an urban campaign which would reinforce efforts to ground the consultations among people and arrive at solutions to new evolving ideas of resilient urban development.

Ministry of Climate Change is the focal of UN-Habitat in Pakistan. With collaboration of this UN agency number of activities have been undertaken in the country. Recently a COVID-19 prevention/response has been piloted in two KatchiAbadis, DhokHassu and DhokMantaal in Rawalpindi. UN-Habitat got an adaptation fund project for Urban Flood and Drought Management from Green Climate Fund for Nowshehra and Rawalpindi with collaboration of the Ministry of Climate Change, which will be launched soon. The Project Management Unit (PMU) will be established in the Ministry of Climate Change to oversee the activities under this project.

World Environment Day, **2021**: Ministry of Climate Change, Government of Pakistan hosted World Environment Day (WED) on 5th June, 2021. The activity was carried out in partnership with the United Nations Environment Programme (UNEP). WED is the United Nations' principal vehicle for encouraging worldwide awareness and action for the environment. This year's observance of WED was on the theme of 'Ecosystem Restoration' and focus on resetting human relation with nature. The day also marked the formal launch of the UN Decade on Ecosystem Restoration 2021-2030. The UN Decade is intended to massively scale up the restoration of degraded and destroyed ecosystems to fight the climate crisis, prevent the loss of a million species and enhance food security water supply and livelihoods. Ministry of Climate Change Ten Billion Tree Tsunami Project was showcased during the celebrations.

Engagement with Asia-Pacific Network (APN)

The Asia-Pacific Network for Global Change Research (APN) is a network of 22 Member Country governments that promotes global change research in the region, increases developing countries involvement in that research, and strengthens interactions between the science community and policy

makers. The APN works to enable developing countries in the Asia-Pacific region to participate increasingly in regional cooperative research, and to benefit fully from such research. The APN was formally launched in 1996 with its first Inter-Governmental Meeting (IGM) and Scientific Planning Group (SPG) meeting in Chiang Mai, Thailand.

Ministry of Climate Change is the focal of APN in Pakistan and Global Change Impact Study Centre (GCISC) has undertaken the climate and global research in Pakistan under various programmes of APN. GCISC is doing research work with APN on climatology, climate projection models and agriculture as well as on other development sectors for GHG inventory. APN also provides capacity building support to the member states through trainings workshops and conferences, whereas the officials from Pakistan have also attended the capacity building workshops organized by APN Secretariat.

Clean Green Pakistan Movement

"Clean Green Pakistan Movement" has been launched with a vision to drive a nationwide movement by the people of Pakistan for the clean and green environment for all citizens of the country. A "Clean-Green Cities Index" has been introduced in 20 cities to trigger a shift towards improved waste management and sanitation. The national campaign underpins behavioral change and institutional strengthening while addressing the five components relating to tree plantation, solid waste management, liquid waste management, total sanitation/hygiene, and safe drinking water.

The Ministry of Climate Change has developed a Clean Green Pakistan Index (CGPI), initially applicable at city level, in order to rank cities according to their cleanliness and greenery indicators. The National and provincial level consultations will be held with relevant stakeholders to determine the viability and adaptation of the proposed Index along with key indicators. A mobile/online application will be developed to submit the data on Dashboard. The existing dashboard managed by the respective provincial departments will be reviewed to create linkage with mobile application. This will further furnish a copy of this data to national CGP dashboard managed by Clean Green Pakistan Unit at MoCC. Based on this data, the cities will be compared based on the performance indicators.

After initial face-to-face training of focal persons, an online training manual shall be developed and made available for respective councils with technical support. A baseline of Household indictors for cities and districts of 1-2 provinces shall be developed by using the available data i.e. MICS and PSLM Pakistan. Later on, the Union Council indicators shall be added for the selected cities. In consultation with provincial governments, the pilot phase of the programme shall be launched in August 2019. The duration of competition shall be for six (06) consecutive months. After scoring on the basis of marks awarded to different performance indicators for comparisons, the best performers shall be recognized at national level.

The Local Councils/Cities Administration will Prepare a monthly report on the performance indicators for submission to Provincial Governments. This data will be updated in the Provincial/Federal dashboards. A

District/City Monitoring & Evaluation Committee shall be formed to review the progress against the performance indicators for submission of monthly scores on the prescribed format. The Provincial Inspection & Validation Committee will inspect the cities included in the pilot phase on the basis of cities report for further endorsement. The final ranking and awards will be reviewed and endorsed by WASH Strategic Unit through making final independent assessment/ reports including visits where required. Further activities are planned as under:

- Provincial Consultation and finalization of Clean Green Pakistan Index
- Selection and finalization of pilot cities i.e. 12 from Punjab and 7 from KPK
- Capacity Development and piloting of mobile application
- Launch of Clean and Green Pakistan Index
- Data Collection and reporting by the participating cities
- Review and recognition of the best cities

Green Economic Stimulus

During the current situation of pandemic COVID-19, Ministry of Climate Change has launched Green Economic Stimulus, which aims at promoting environmental activities which can also have economic impacts. The Stimulus would focus on creating livelihood opportunities for daily wagers in the forestry and waste management sectors. Subsequently, Ministry of Climate Change has developed a Post-Covid-19 Response Plan, which focuses on a just transition towards Greener/ environment friendly activities.

South Asia Co-Operative Environment Programme (SACEP)

Ministry of Climate Change in the Government of Pakistan being member state of SACEP has been supporting the SACEP Strategy for 2020-2030.The strategy was formulated in response to decision made in SACEP Governing Council meeting. Main objectives of strategy is to promote regional co-operation in South Asia in the field of environment, both natural and human and on issues of economic and social development which also impinge on the environment and vice versa; to support conservation and management of natural resources of the region and to work closely with all regional, national and international institutions, governmental and nongovernmental, as well as experts and groups engaged in such co-operation and conservation efforts.

During the 2020–2030 period, SACEP is pursuing the following strategic goals in the region. Together, these goals define the core priorities and focus of SACEP:

i. Enhance resilience to the impacts of climate change through mitigation and adaptation measures
ii. Conservation of ecosystem and biodiversity
iii. Ensure effective waste management at all levels
iv. Ensure better air quality to safeguard health and well being

v. Strengthen low-emission development, improve resource efficiency for transition to an inclusive green economy and fostered sustainable and healthy lifestyles
vi. Strengthen environmental governance for evidence-based decision making

Shanghai Cooperation Organization (SCO):

Shanghai Cooperation Organization (SCO) is a political, economic, and security alliance created on 15 June 2001 in Shanghai (China). The SCO comprises of eight Member States – China, India, Kazakhstan, Kyrgyzstan, Russia, Pakistan, Tajikistan, and Uzbekistan. Afghanistan, Belarus, Iran, and Mongolia are interested in acceding full membership as observer states. It has also six Dialogue Partners Armenia, Azerbaijan, Cambodia, Nepal, Sri Lanka, India, and Pakistan officially joined the SCO as full-fledged member in June 2017. SCO aims to:-

- Strengthen relations among member states;
- Promote cooperation in political Affairs; economic and trade, scientific-technical, cultural, and educational spheres as well as in energy, transportation, tourism, and environmental protection;
- Safeguarding regional peace, security and stability

The Ministry has been participating in the Heads of the Ministries and Agencies and Expert Group meetings of SCO Member States responsible for environmental protection. The main objective of these meetings is to discuss practical cooperation and ensure environmental sustainability and climate resilience in the SCO region. Discussion on Greening of Belt and Road Initiative (BRT) and China-Pakistan Economic Corridor (CPEC), being part of BRT, Ecological Wellbeing of the Cites in SCO region are part of these events which are potential opportunities for Pakistan in the field of regional environmental protection and climate change.

Conversion of Brick kilns in Zig-Zag Technology.

There are around 10,000 brick kilns in Pakistan. These Kilns have been operated on conventional obsolete technologies and have been contributing to air pollution and SMOG issues in winter, in and around major cities of Punjab and Khyber Pakhtunkhwa while affecting health and wellbeing of general masses.

Ministry of Climate Change in collaboration with Federal and Provincial EPAs, Clean Air Coalition of UN Environment, International Centre for Integrated Mountain Development (ICIMOD), National Energy Efficiency and Conservation Authority (NEECA), Pakistan Engineering Council, Pakistan Brick Kiln Owners Association, academia and other stakeholders have initiated the process of converting conventional brick kilns to Zig-Zag technology. The conversion of brick kilns on Zig-Zag technology is under process and resulted in reduced emissions and fuel saving. The conversion initiative comprises of the following components:

1. Sensitizing the Brick Kiln owners through the Pakistan Brick Kiln Owners Association.

2. On-site training of Brick Kiln workers.
3. Exposure visits to regional countries.
4. Arranging soft loans from the Banks.

The Ministry has been facilitating on-site trainings for the Brick Kiln Owners Association of Pakistan through International Center for Integrated Mountain Development (ICIMOD) Nepal NEECA, Ministry of Energy.

Collaboration with Global Green Growth Institute (GGGI), South Korea

Ministry of Climate Change is a policy formulation body with regard to Climate Change including environmental protection. The Ministry has processed an Agreement for Pakistan to become a participating member of the Global Green Growth Institute (GGGI), South Korea. The Federal Cabinet has approved the proposal and it is under process of final approval by the Ministry of Foreign Affairs.

GGGI is a treaty-based international organization. It aims to promote green growth paradigm characterized by a balance of economic growth and environmental sustainability. The institute would provide support for green economic growth, simultaneously addressing poverty reduction, job creation, social inclusion, and environmental sustainability and works across four priority areas considered to be essential to transforming national economies, including energy, water, land-use, and green cities. The agreement aims to formalize a framework of cooperation to promote green growth planning and implementation in Pakistan which includes:

a) Support in the development of Climate Resilient Growth Strategy; and
b) Integrating green growth into public sector development strategy.

Projects of Environment/Climate Change Wing:

The wing has been executing the following projects:

Project Title: **Establishment of Pakistan WASH Strategic Planning and Coordination Cell (Facilitating Achievement of SDG 6.1 and 6.2)**

The UN Member States have principally agreed on the Post 2015 development agenda called the Sustainable Development Goals (SDGs). SDG 6.1 and 6.2 are directly related to WASH sector (water and sanitation) which are required to be met within stipulated time-frame as per laid down targets. The Ministry is mandated for WASH sector coordination at the federal level alongside with the responsibility of reporting progress and sustaining stakeholder dialogue including all federating units as well as international development partners. Under the project a WASH Support Unit at the federal level in Ministry of Climate Change has been established. The Unit is expected to receive technical and material support from international development partners including UNICEF and the World Bank. The Unit facilitate to fast-track progress towards achievement of SDG 6.1 and 6.2. for following specific outputs:

1. Putting in place an effective coordination mechanism at national level involving all federating units and relevant development partners for developing harmonization, integration and synergies among key WASH stakeholders on WASH sector.
2. Promoting knowledge management, donor support, M&E, and periodic reporting mechanisms for SDGs 6.1 and 6.2 through close liaison with all federating units.
3. Nurturing cross-sectoral linkages with other sectors (academia, private sector, organizations working on themes of health, education, nutrition etc.) for putting in place a holistic approach for deepening and sustaining WASH sector reforms.

Under the project, in-house capacity of Ministry of Climate Change is being augmented to enable it perform its mandate in line with Federal Government's international commitments (including South Asian Corporation on Sanitation (SACOSAN) Sustainable Development Goals attainment etc.) in a technically sound manner, underscored by political consensus building and stakeholder collaboration. The Unit will also re-position Ministry of Climate Change to fully benefit from emerging national, regional and international deliberations and opportunities for augmenting and complimenting efforts of federating units for a robust institutional response to key WASH sector challenges in Pakistan. The Unit serves as federal level nerve center and jointly owned institutional platform for ensuring smooth collaboration and sustaining meaningful dialogue involving federal/provincial governments, civil society, private sector, academia and international development partners having stakes in WASH sector in Pakistan.

Major activities performed during 2020-21:

WASH Sector Reform Agenda**:**

- Stakeholder Consultation Meeting to define WASH Sector Reforms (Development of National WASH Programme) was held on 14th October, 2020. Report of the consultation meeting has been finalized and approved.
- Developed TORs relating to WASH Coordination Committee and Research Caucus. Consultation on the TORs has been completed with AJK, Punjab and Khyber Pakhtunkhwa.

Post Covid National WASH Programme:

- WASH Sector Reform Agenda has led to the development of an umbrella PC-I on Post-Covid National WASH Progamme.
- A follow-up consultation was held with the provinces on 18th Feb, 2021 to finalize provincial PC-Is. A consolidated umbrella PC-I has been compiled and submitted to Planning Commission for approval through CDWP.

Stakeholder Consultation on SDG-6:

- Stakeholder Consultation Meeting on SDG 6 was held on 19th January, 2021 which was attended by representatives from all provinces and Pakistan Bureau of Statistics.
- Identification of capacity gaps for technical reporting and improving statistical capacities for collection and compilation of data in line with Sustainable Development Goal (SDGs) indicators by organizing stakeholder consultation meetings was finalized for the following:
    a. Establishment of Periodic Reporting Mechanism for Data Collection and Compilation.
    b. Development of Data Reporting Status of Respective SDG (6.1 & 6.2).

Clean Green Pakistan Index (CGPI):

- Twenty (20) selected cities in the two provinces (13 in Punjab and 07 in Khyber Pakhtunkhwa) have been ranked in terms of cleanliness and greenery standards in the 1st phase of CGPI. The pilot phase was concluded with the announcement of awards by the Prime Minister at the Encouragement Award Ceremony held on 19th October 2020.
- In the 2nd phase, CGPI has been rolled out in 93 cities across Pakistan.
- Third Party Monitoring for the 2nd phase will be conducted by GIZ and the Gates Foundation.

Project Title: Climate Resilient Urban Human Settlement Unit

The project aims to ensure climate resilient urban development at national level, fulfil relevant international commitments of Federal Government, put in place a dedicated mechanism to coordinate provincial urban settlements policies. Its total cost is Rs.90.158 million. The initiative facilitates in translating and linking the provincial and local urban intervention with national scenarios after 18th amendment, and accordingly to synthesize efforts being made to counter the hard impact of unplanned and messy urbanization in the context of demography, economic, socio cultural and political arena. It coordinates Government of Pakistan's efforts regarding the environmentally sustainable urban development and human settlements, and to establish a ministerial-level mechanism to regularly report the sectoral progress and accomplishments. Following are the major objectives of the scheme: -

1. Plan and implement the harmonized Action Plans for developing "Climate Resilient safe & Sustainable Cities", in collaboration with the Pakistan Urban Planning & Policy center at Ministry of PD&R (Planning, Development& Reforms); along with the UN-Habitat (Pakistan); all Provincial Urban Units; and the Line Departments of P&D; Local Governments; Housing & Urban Development of the Governments of Gilgit & Baltistan and the AJK.
2. Facilitate provincial urban units in launching community-motivated urbanization initiatives and in implementing urban projects;
3. Facilitate their access to external funding with development partners and set aside international funds for adopting actions in developing Climate Resilient cities like the adaptation fund; Global Environment Facility and Green Climate Fund in addition to the increased Government's budgetary allocation
4. Assist Pakistan Urban P&P Centre in Ministry of PD&R; in implementing Pakistan Vision 2025 strategic initiatives for transforming all urban human settlements into economic growth hubs and eco-friendly sustainable cities through improved governance, effective urban planning, efficient mobility infrastructure, better security & community participation in collaboration with city governments.

5. Develop and strengthen the capacity of city administrations to assess the emission targets and adopt low-carbon energy-efficient comprehensive Action Plans to convert their urban-heat islands into "Climate Resilient Cities", towards fulfilling international commitments of the federal government through the focal Ministry of Climate Change.
6. Strengthen the city governments' capacity in engaging the line departments and agencies and also the non-state actors to effectively meet the urban development challenges throughout Pakistan, as per the international obligations of Federal Government to meet the UNEP; UNFCCC & UN-Habitat targets under Rio+20 Declaration; New Urban Agenda; and SDGs.
7. Strengthen institutional capacity of Provincial Urban Units; GB & AJK by augmenting their technical-knowledge& integrating their working mechanism to streamline future urbanization throughout Pakistan; thus enabling them to develop people-centered "Cities for Life", through efficient service-delivery based on information from an integrated Web-Net Databank of all human settlements scenario including the SDGs (i.e. rural-urban migration and demographics; urban poverty & land-use, GHG emissions& temperatures; informal slums, etc.).

The following activities have been completed during the year 2020-21:

1. Draft "Pakistan Resilient Urban Policy Framework (adapting & mitigating the impact of climate change on cities 2020) has been prepared and is under consultation with the key stakeholders on Climate Resilient Urban Development.
2. Streamlined SDG-11 (Sustainable cities & communities) to make cities inclusive, safe, resilient and sustainable in collaboration with stakeholders. Response is received from Sindh, Bureau Statistics Islamabad & Urban Policy and Strategic Unit Lahore; the information will be gathered and shared accordingly with SDG Unit established in Ministry of Planning Development and Special Initiatives.
3. Development of web portal spurs to develop linkages with Provincial Urban Units.

Climate Change Authority, under the Climate Change Act, 2017

Pakistan Climate Change Authority was established through an Act of Parliament i.e Pakistan Climate Change Act 2017. In order to operationalize the Pakistan Climate Authority, Ministry of Climate Change has created 72 new posts through Finance Division. Currently, Ministry of Climate Change is processing the draft Services Rules for Pakistan Climate Change Authority in consultation with Ministry of Finance, Law Division and Establishment Division. Ministry of Finance has in principle agreed to the terms and conditions from financial point of view, whereas the Establishment Division has partially agreed to the draft services rules of Pakistan Climate Change Authority. Currently, process of hiring the legal consultants for drafting and restructuring of the CCA is under process. Once the Services rules are approved/ vetted by the relevant Ministries'/Division, the same will be notified. Accordingly, recruitment process for the Climate Change Authority will be initiated by Ministry of Climate Change.

Pakistan's First Biennial Annual Report (BUR) to UNFCCC

As an effort to enhance reporting mechanism for UN Climate Change Convention, Pakistan has prepared its First Biennial Update Report. This activity is supported by Global Environment Facility (GCF) through United Nations Environment. The objective of the project is to fulfil the decisions of COP 16 & 17, which

require developing countries to submit biennial update reports (BURs) containing updates of national greenhouse gas inventories, including a national inventory report and information on mitigation actions, needs and support received.

The project components include national circumstances and institutional arrangements, GHG inventory by sources and removal by sinks, mitigation actions and their effects, constraints, gaps and related financial, technical and capacity needs, support received for preparation and submission of biennial update report and information on domestic MRV as well as any other information relevant to the achievement of the objective of the convention including information on gender and climate change. In undertaking these activities it is envisaged that the country will firstly institutionalize various components of climate change, like GHG, secondly it will help understand where the country contributes the most to GHG and lastly identify ways on how to reduce the emissions. In understanding this, the country will be in a better position to devise and implement appropriate measures to mitigate and adapt to climate change, include accessing finance and appropriate technology transfer in line with the national policy objectives and guiding principles.

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FORESTRY WING

STATUS OF FORESTS, WILDLIFE & BIODIVERSITY RESOURCES IN PAKISTAN

According to the latest National Forest Reference Emissions Level (FREL) findings, the country is maintaining 4.786 million hectare (5.45%) area under forest cover. By forest type, dry temperate forests have the largest proportional coverage (36 %) followed by sub-tropical broadleaved shrub (19 %), moist temperate (15 %), Chir Pine (13 %), Riverine (4 %), irrigated plantation (4 %), thorn (3 %), mangrove (3 %) and subalpine forests (2 %).

Unfortunately, climatic conditions, rural poverty, dependence on the natural resources, meager forest cover and high rate of deforestation have rendered the country one of the most vulnerable to climate change effects. Forest, Biodiversity and Wildlife resources have also suffered from the adverse effects of climate change. Besides these resources are under tremendous pressure owing to change of land use and habitat destruction. Due to population increase the consumption of fuel wood and timber extraction has increased. Such pressures have rendered most of the forests of poor and medium density in need of drastic restocking on war footing.

The overall improvement of the sector in the country will require continuous efforts through a number of initiatives under long term planning and programmes. Existing meager forest resources being crucial to environmental stability demand serious interventions supported with commitment for adequate financial flows to improve and enhance the overall forestry, wildlife and biodiversity sector.

MAJOR ACTIVITIES OF FORESTRY WING

Ten Billion Tree Tsunami Programme (TBTTP)

The implementation of the TBTTP was initiated in 2019 with a total cost of Rs. 125.1843 billion on cost sharing basis for four years (2019-2023) to plant / regenerate 3.29 billion plants in the provinces / territories. As reported by the provinces / territories a total of 528.34 million plants were planted/regenerated/ distributed during 2020-21. However, a cumulative total of 1007 million plants were planted / regenerated / distributed to increase tree cover on 0.488 million hectares over the past two years. During the extraordinary circumstances created by the COVID-19, the provincial Forest and Wildlife Departments, AJK and GB provided about 85,000 green jobs during 2020-21.

An independent third party consortium of IUCN, WWF and FAO conducted preliminary assessment of the achievements of this programme. It was concluded that success of the plantation/regeneration ranged between 75-95%. This initiative of the Government has also been registered under Bonn Challenge.

Digital Progress Reporting System for TBTTP

Ministry of Climate Change developed a robust digital reporting system to ensure the transparency of TBTTP activities. The system was developed by in-house development team of TBTTP with in a period of six months. This system is capable to capture all the activities including block plantation, linear plantation, assisted natural regeneration and nursery management system, performed under forest component of TBTTP. Ministry of Climate Change has successfully organized workshops to provide training on digital reporting system to all the DFOs across the Pakistan. TBTTP is currently developing a monitoring platform to ensure transparency of the programme. In this regard, GIS team of TBTTP developed a web-GIS monitoring portal which is capable to visualize the plantation sites geographically with detailed information of the site and processed satellite imagery of pre & post plantation status. The reporting system for wildlife component is under preparation.

Protected Areas Initiative

The initiative was launched by the Prime Minister to improve management and governance of 23 protected areas in the country. The initiative will result in preserving rare fauna / flora and promote eco-tourism. It is expected that 5,500 persons will get job opportunities under this initiative. The total protected area will get enhanced from 12% to 15% by 2023. The Prime Minister inaugurated Nanga Parbat National Park and Himalayan National Park in GB to achieve the targets envisaged under this initiative. In Punjab, the Prime Minister annouced Tilla Joggian Park and Salt Range National Park under the same initiatves.

Billion Tree Honey initiative

The initiative was launched by the Prime Minister as a coherent effort of different Ministries/ Agencies to promote Apiculture in the country. It is estimated that the existing forest resource will increase to about 5.5 million hectares after addition of new areas being planted / regenerated under TBTTP by 2022-23. It was estimated that about 10,000 bee keepers were using 300,000 colonies for producing 7,500 metric tons of honey annually. The potential can be enhanced to produce 70,000 metric tons of honey from the same harvest by using modern bee keeping gears, training on latest techniques, standardization / certification of the product and intensive marketing. It is anticipated that marketing of 70,000 metric tons of honey will generate an income of about Rs. 20-25 billion in the national economy and provide about 87,000 green jobs.

The available forest resource shall be used by the bee keepers to produce honey specific to particular flora and shall be branded accordingly. The National Vocational and Technical Training Commission (NAVTTC)

shall provide training to the selected beekeepers along with technical support, follow-up of on-ground activities and product extraction. The certified bee keepers shall be provided financial support. The Ministry of Science and Technology shall be responsible for certifying the honey produced under the programme. The Ministry of Commerce shall patent the market brand of 'Ten Billion Tree Honey'. A pilot project on the initiative was launched for assessing the output of Honey using modern bee hives in different ecological zones. A large scale project shall soon be launched to undertake the initiative across country.

REDD+ Readiness and Preparation Project

'Reducing emissions from deforestation and forest degradation, conservation of existing forest carbon stocks, sustainable forest management and enhancement of forest carbon stocks' (REDD+) is a concept adopted by the countries under United Nations Framework Convention on Climate Change (UNFCCC) in 2010. The concept relates to absorption of atmospheric carbon through forest resource. Due to accumulation of carbon in standing trees, their financial value increases. Carbon stocked in forests is traded in carbon markets.

Ministry of Climate Change is implementing REDD+ Readiness Preparation Project with financial grant of USD 7.81 million received under the Forest Carbon Partnership Facility (FCPF) of the World Bank to complete following four essential elements of the REDD+ in order to fulfill the requirements of accessing result-based payments under REDD+ mechanism.

i. Development of National REDD+ strategy and implementation framework
ii. National Forest Monitoring System
iii. Forests Reference Emission Levels and/or Forest Reference Levels
iv. Safeguards Information System

The project is under implementation for the period from 2015 to 2022. The progress made under the project is as under:

i. National Forest Reference Emissions Level (FREL), based on historical assessment of deforestation during the period 2004 to 2012, was prepared and submitted to UNFCCC on 6th January, 2020 for technical assessment by the panel of UNFCCC experts. UNFCCC has endorsed the FREL prepared for Pakistan.
ii. Protocols have been developed for National Forest Monitoring System (NFMS) and Monitoring, Reporting and Verification (MRV) system.
iii. Framework has been developed for Safeguards Information System (SIS) for REDD+ together with Strategic Environmental and Social Assessment, Environmental and Social Management and Feedback Grievance Redressal Mechanism.
iv. Draft National REDD+ Strategy has been prepared.
v. Design of Payment for Ecosystem Services (PES) has been completed for two ecosystems i.e. Mangroves and temperate forests.

Reversing Deforestation and Forest Degradation in High Chilgoza Pine Forests Pakistan Balochistan Progress

The major achievements of the project during 2020 and 2021 are as under:

2020

- Distributed 38,000 forest and 1338 Fruit Plants
- Distributed 40 Chilgoza Harvesting Toolkits among communities
- Established and demarcated 13 ANR sites comprised of 630 Ha (GPS coordinates and report)

2021

- Distributed 48,500 forest and 3700 fruit plants
- 50 Acers Block Plantation raised in Adil Abad
- 6 Cone Crushers procured and will be provided before start of Chilgoza harvesting season

Declaration of Marine Protected Areas

Astola Island was declared as first marine protected area of Pakistan. Consultative process continued on management planning of Astola island with the involvement of all stakeholders. Active consultation is in process with other Ministries of Defence, Maritime Affairs and the provincial governments to increase MPAs in the country.

Membership of International Network on Bamboo and Rattan (INBAR)

INBAR is an Inter-Governmental Organization established in 1997 to promote environmentally sustainable use of Bamboo and Rattan. The President of Pakistan signed the Letter of Accession to become member of INBAR. The network will support Pakistan in propagation and value chain development of Bamboo in the country.

MoU with Elion Resources Group Co. of China

The Prime Minister of Pakistan witnessed the signing of an MoU with Elion Resources Group to establish China-Pakistan Ecological demonstration zone in Pakistan with an approximate cost of USD 5 million. The zone shall be developed to demonstrate desertification control based on Kabuqi model successfully implemented in China.

Natural Capital Account:

Pakistan has signed a letter of support with the UK Statistics Authority to develop guideline for Natural Capital Accounting system for Pakistan.

High Ambition Coalition

Pakistan joined the high ambition coalition for nature. It supports efforts being made globally to protect Biodiversity resources. The coalition reiterates commitment towards achieving the post-2020 target of 30 X 30.

Invasive Alien Species Plan

Ministry of Climate Change in collaboration with Ministry of National Food Security and Research (MNFSR) and Centre for Agriculture and Bioscience International (CABI) has initiated a consultative process for development of National Action Plan for Invasive Alien Species (IAS). The consultation process will involve participation of diverse stakeholders to include the inputs from various ecosystems and habitats and across the sectors like fisheries, forestry, wildlife and agriculture.

Biosafety Clearing House Project

National level consultative and capacity building project on Biosafety Clearing House is already endorsed and approved. This UNEP led process could not be initiated due to Covid-19 outbreak.

Finalization and submission of Fourth National Report of Cartagena Protocol

Preparation of 4th National Report on implementation of Cartagena protocol is also accomplished during the year.

International Day of Biodiversity

The International Day for Biological Diversity was observed on 22nd May 2021 by Biodiversity Directorate of Ministry of Climate Change and other stakeholders. Due to Covid19 outbreak, the message was delivered mainly using social media and other communication means.

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INTERNATIONAL COOPERATION (IC) WING

International Cooperation Wing of the Ministry of Climate Change consists of three sections/units which are responsible for performing a range of functions;

1. Chemical Section is mandated to set ground for implementation of various chemical and waste related Conventions namely Basel, Stockholm, Minamata, Rotterdam Conventions, etc.
2. National Ozone Unit was established in 1996 after the signing and ratification of Vienna Convention and Montreal Protocol on the Substances that Deplete the Ozone Layer by Pakistan. The main objectives of NOU are to control consumption of Ozone Depleting Substances (ODS) and assist the local industry for phasing out the use of ODS through financial and technical support of the Multilateral Fund Secretariat (MLFS).
3. International Cooperation Section is responsible for coordination with international environmental agencies on environmental issues, signing & implantation of MOUs, handling of matters related to GSP+. Moreover, it also represents Pakistan at international forum with respect to the signed Conventions and Protocols.

During the year 2020-21, all the aforementioned sections have performed a number of functions, while keeping in view their main agenda items. Detail of the activities and achievements of IC Wing has been enunciated below:

1. Chemical Section

a. Ratification of Minamata Convention on Mercury

Minamata Convention on Mercury was adopted on October, 2013 and Pakistan signed the Convention on 10th October, 2013 at Kumamoto, Japan. Federal Government has approved ratification of the Minamata Convention on Mercury on 6th October, 2020. The objective of said Convention is to protect the human health and the environment from anthropogenic emissions and releases of mercury and mercury compounds.

Following measures have been taken to implement the Minamata Convention:

- **i.** Chlor-alkali industries like Ittehad Chemicals, Sitara Chemicals, NIMIR Chemicals and Engro Polymer and Chemicals Ltd have already phased out mercury based technology.
- **ii.** Light manufacturing industries like Philips Pakistan and Khyber Lamps have stopped the manufacturing of mercury added compact florescent lamps.
- **iii.** The Ministry has imposed restriction on the import of mercury and mercury compounds in Import Policy Order.
- **iv.** Project concept note on "Development of National Action Plan (NAP) for Artisanal and Small Scale Gold Mining (ASGM) Sector of Pakistan" was prepared for funding from third round of Specific International Programme under Minamata Convention.
- **v.** MoCC conducted analysis of 59 samples of national and international brands of Skin Whitening Creams (SWCs). Out of 59 samples only 3 brands met the permissible limits of Minamata Convention i.e 1 PPM.

vi. Submitted an application for the project titled" Development of National Action Plan(NAP) for Artisanal and Small Scale Gold Mining (ASGM) Sector of Pakistan" for funding from third round of Specific International Programme under Minamata Convention

b. Funding from UNEP for Waste Management Directorate

International Cooperation Wing of the Ministry secured funds amounting to USD 75,000 from UNEP for the project titled "Strengthening of National Legislation and Capacity Building of Stakeholders for Sound Chemicals and Hazardous Waste Management in Pakistan". The basic mandate of this project is to establish Waste Management Directorate in the Ministry of Climate Change for working on the formulation of National Hazardous Waste Management Policy and legislation. The Directorate will also be responsible for doing technical work on management of all kind of waste.

c. Plastic Waste Import Study

China and India imposed ban on the import of plastic waste recyclable in 2017 and 2019, respectively. Plastic waste from developed countries diverted to South Asian region including Pakistan. 624 containers of plastics waste were dumped on various ports of Karachi in 2019. Out of these 624 containers, 587 were from USA, 23 from Singapore, 12 from UK and 2 from Hong Kong. Keeping in view the detrimental impact of plastic waste, Ministry of Climate Change imposed a temporary ban on the import of plastics in June 2020.

Subsequently, a Technical Committee comprising of representative from Ministry of Climate Change, Industries, Commerce, Federal Board of Revenue and the Federation of Pakistan Chambers of Commerce & Industry (FPCCI) was constituted. Technical Committee decided to commission a study on plastics waste as no data was available for informed decision making. Consultant was mobilized who completed the study on a national level. Some of the major findings of the study are:

i. Pakistan generates approximately 30 million tons of solid waste per year.
ii. As per estimates, around 3.3 to 6 million tons of the plastic waste is generated per year in Pakistan.
iii. Plastic waste in Municipal Solid Waste accounts for 10 – 14 %:
    a. 3.9 Million ton of plastic waste was generated in 2020 which is expected to DOUBLE to 6.12 Million ton /annum by 2050.
    b. 10 % of this plastic waste are single use plastic bags (5 billion plastic bags are used annually in Pakistan making it around 0.376 million tons/annum)

iv. 70% (Approx 2.6 Million ton) of plastics waste is mismanaged and only 30% (1.3 Million ton) is recycled/processed.

v. There are 6,000 plastics producing units in Pakistan: 60% in Punjab with 360,000 workforce, 30% in Sindh with 180,000 workforce, 7% in KP with 42,000 workforce and 3% in Baluchistan with 18,000 workforce.

The case of ban on the import of plastic waste was also presented before the Prime Minister on 4th August, 2021. The Prime Minister directed the Ministry to develop a comprehensive action plan to restrict import of plastic waste.

d. Reactivation of Ban on Polythene Bags Regulations, 2019

MoCC in collaboration with Islamabad Capital Territory (ICT) Administration, Pakistan Environmental Protection Agency (Pak-EPA), Capital Development Authority (CDA) and Metropolitan Corporation Islamabad (MCI) follows a comprehensive Implementation strategy to reactivate the implementation of Ban on Polythene Bags Regulation, 2019.

- From August 2019 to July 2021, fines of Rs. 2.7 Million have been imposed & about 3,200 Kgs polythene bags have been confiscated.
- Furthermore, Mobile App on "Ban on Polythene Bags" has been integrated into City Islamabad application.

e. Concept Paper for Hazardous Waste Management Facility

A concept paper for the project titled "Establishment of Common Hazardous Waste Treatment, Storage and Disposal Facility (CHW-TSDF)" was prepared and submitted for seeking Global Environment Fund (GEF) funding. Moreover, site for allocation of plot to establish CHW-TSDF at Gaddani Port Baluchistan for handling of waste from ship dismantling industry has also been finalized.

f. Project Persistent Organic Pollutants (POPS)

Persistent Organic Pollutants (POPs) are highly toxic chemicals, considered as a global threat to Human Health and environment. Global Environment Fund (GEF) sponsored project titled "Comprehensive reduction and elimination of Persistent Organic Pollutants (POPs) in Pakistan" signed in 2015 by UNDP Pakistan involving Ministry of Climate Change (MoCC) as the implementing partner. The Project POPs was successfully completed on 31st December, 2020.The project's most significant achievements are summarized as:

i. Project disposed 786 MT out of 1200 MT of POPs and 42 MT of PCB contaminated oil out of 300 MT by following Best Available Techniques/Best Environmental Practices technologies. 344 MT of POPs and 300 MT of PCB contaminated oil has been disposed off.

ii. Draft Regulation on POPs management and PCB Management Plan was developed at federal level.

iii. National Technical POPs Management Guidelines were prepared at federal and provincial levels.

iv. National Chemical Profile and their management was prepared.

v. Training manual for best management practices on POPs and PCBs was prepared.

vi. Project created awareness among the user group (farmers, women and children) about the toxicity impacts of POPs and PCBs at the community level. 1,295 persons from agriculture and energy sectors, staff from provincial EPAs, private sector, customs, academia and community representatives were trained.

g. Organized First National Dialogue and Stakeholder Convening with the Collect and Recycle (CoRe) Alliance on topic "Collective action approach to deal with packaging waste" at Islamabad.

h. Submitted a project titled "Development of national inventory of plastic waste in Pakistan" to Basel Convention Regional Centre, Tehran for funding under Small Grant Program (SGP) on plastic waste.

i. Project Identification Form (PIF) approved under GEF-7 for regional project titled "Reducing uses and releases of chemicals of concern, including POPs, in the textile sector for Bangladesh, Indonesia, Pakistan and Vietnam".

2. National Ozone Unit

Montreal Protocol on the Substances that Deplete the Ozone Layer was signed at Montreal, Canada, in 1987. Pakistan signed and ratified the Protocol in 1992. The National Ozone Unit was established under the devolved Ministry of Environment in 1996 to supervise and ensure implementation of the Protocol. The National Ozone Unit (NOU), established under Institutional Strengthening for the Montreal Protocol project.

Major achievements of NOU during the year-2020-21 are as follows: -

(a) Implementation of the ODS Phase Out Projects:

i. NOU, MoCC hired a consultancy firm for preparation of HFC assessment report of Pakistan to proceed with ratification of Kigali Amendment.

ii. Seminar on World Ozone Day (WOD) was organized on the 16th September, 2020 at Faletti's Hotel, Lahore. Honorable Special Assistant to Prime Minister on Climate Change Mr. Malik Amin Aslam attended the event as Chief Guest. People from different segments of life participated in the seminar. Public was briefed about the benefits of using ozone friendly technology. NOU underscored major work undertaken by Pakistan for protection of Ozone Layer.

iii. Special newspaper supplement was published in different national dailies on the evening of World Ozone Day-2020 to create awareness among the general public about the protection of ozone layer. The articles in newspaper supplement remained focused on Kigali Amendment and energy efficiency.

iv. National Ozone Unit released video message of Special Assistant to Prime Minister on Climate Change on World Ozone Day – 2020. The video message was widely shared on social media.

v. Thirty Second Meeting of the Parties (MoP) to the Montreal Protocol on Substances that Deplete the Ozone Layer was organized online from 23 - 27 November, 2020. Syed Mujtaba Hussain, Sr. Joint Secretary (IC)/NPD (NOU) and Mr. Zia Ul Islam, NPM (NOU) represented Pakistan.

vi. Assessed the HCFC importers warehousing facility and directed them to maintain their warehouses meant for HCFC storage as per the MSDS.

vii. For smooth implementation of the HCFC phase out programme the industrial / commercial importers data for HCFCs import was monitored on monthly basis during the reporting period. National Ozone Unit updates the HCFCs importers regarding latest requirements of the ODSs storage and maintenance.

viii. National Ozone Unit (NOU), Ministry of Climate Change (MoCC) organized a meeting with the UNIDO Consultant Mr. Iqbal P. Sheikh at Islamabad on February 25, 2021. The purpose of the meeting was to discuss the preparation and outcomes of the HPMP stage III.

ix. NOU, MoCC organized a consultative meeting of the HPMP stage-III stakeholders on March 06, 2021 at Park Lane Hotel, Lahore. In meeting the HPMP stage-III phase out plan was discussed with all the relevant stakeholders. The consultative meeting was attended by a number of delegates from industries, importers, services workshops, Federal and Provincial Governments, associations, NGOs and notables. The HPMP stage-III proposal was unanimously agreed by all the relevant industries and other stakeholders.

x. Issued and monitored HCFCs import quota for the year 2021.

xi. HCFC Quota was issued to the eligible importers of HCFCs on 10th March, 2021 by taking all the stakeholders on board.

xii. Pakistan attended the Fourth Extraordinary Meeting of the Parties to the Montreal Protocol, online on 21 May 2021

xiii. Pakistan attended the Forty Third Meeting of the Open Ended Working Group (OEWG) of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer from 22 and 24 May and 14–17 July 2021. It is pertinent to mention here that OEWG is the second highest forum of the Ozone Secretariat which meets once a year to discuss and review the Ozone Depleting Substances related issues and reports of various Technical Option Committees working under the Ozone Secretariat. OEWG meeting also deliberates upon any proposals for adjustment or amendment to the Protocol.

xiv. Organized training programme for Refrigeration and Air Conditioning (RAC) technicians in collaboration with SBTE and STEVTA at Karachi and trained 67 technicians from 22nd – 29th July, 2021. All these technicians were trained by Master trainers under HPMP-II programme.

xv. Celebrated World Environment Day 2021 on June 05. The day was celebrated through social media campaign due to COVID-19 issues.

xvi. Celebrated World Refrigeration Day 2021 on June 26 remotely. The day was celebrated through webinars and awareness campaign.

i. Enforcement of Policy / Regulatory Measures:

a. Advertisement for inviting quota requests was published on 15th January, 2021. Applications received for the quota were minutely examined in a full transparent way. Quota for 2021 was issued

on March 10th, 2021. The criteria of the Montreal Protocol were followed as per the commitment and practice.

b. In order to phase out the ODSs from the thermoware, PU sandwich panel, XPS and air conditioning industries NOU along with relevant implementing agencies is implementing HPMP Stage-II. After that, the remaining industries in Air Conditioning and spray foam would be phased out for which funding request has been approved by MLFS to prepare and submit the HPMP stage III for Pakistan for the period 2021-2030.
c. To phase out HCFCs from remaining industries NOU, MoCC in collaboration with relevant implementing agencies had developed the project proposal for stage-III of the HPMP. The proposal was submitted to the 87th Ex. Com meeting of the Multilateral Fund for the implementation of Montreal Protocol.
d. To review the implementation of HCFCs quota the NOU organized quarterly review meetings with importers at Karachi and Lahore.
e. NOU improved its presence in field by visiting warehousing of all quota holders and bringing significant improvements
f. Collected, analyzed and submitted Data for Article 7 Report and Country Programme Reports for 2020 well on time to ensure compliance status of Pakistan.
g. 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.
h. Organized training programme for Refrigeration and Air Conditioning (RAC) technicians in different areas of Pakistan and trained 173 technicians from 01st July, 2020 to 30th June 2021. All these technicians were trained by Master trainers.
i. Various online meetings were held with UNIDO and UNEP offices at Vienna and Bangkok respectively on following issues regarding policy and phasing out of the ODSs: -
    a. Preparation and submission of HPMP stage-III;
    b. Submission of 3rd tranche request for HPMP-II;
    c. Implementation of HPMP-II remaining projects and corresponding challenges;
    d. Working of the PMU for HPMP-II;
    e. HS codes for HFCs.

3. International Cooperation Section

a. Pakistan Green Diplomacy Initiative

As per the directive of the Prime Minister of Pakistan, Ministry of Climate Change, being the lead Ministry, prepared a comprehensive plan titled “Pakistan Green Diplomacy Initiative” (PGDI) in close consultation with the Ministry of Foreign Affairs, National Security Division and other relevant Ministries/Divisions.

Basic Mandate of the PGDI is to:

i. Promote global leadership of the PM as the "Green Prime Minister".
ii. Secure benefits from mechanisms established under UNFCCC and PA.
iii. Enhanced financial flows for climate and environmental actions.
iv. Develop synergies with Economic Diplomacy initiatives.
v. Strengthen Pakistan engagements with bilateral and multilateral development partners.

b. Joint Statement of Intent on Design of Nature Performance Bond with the UK, Germany and Canada

Government of Pakistan signed Joint Statement of Intent on Nature Performance Bond (NPB) with the UK, Germany and Canada on 3rd June 2021. It is a new financial instrument which has been introduced for the first time in Pakistan. Under the umbrella of NPB, performance regarding nature based interventions will be evaluated to provide relief in debt repayment. It will create a linkage between investment in nature and stabilization of economic base. NPB offers diverse prospects for investment in nature, debt reduction and environmental protection.

c. Submission of Current Status of International Conventions to EU GSP Plus:

IC Wing submitted current status and way forward on environment related Conventions to Ministry of Commerce. In this regard, Senior, Joint Secretary (IC) also attended the meeting of Treaty Implementation Cell (TIC) which was chaired by the Attorney General of Pakistan.

d. Coordination with EAD and MoFA:

As per Rules of Business, 1973, IC Wing consistently coordinates with M/o Economic Affairs and M/o Foreign Affairs and provide technical input for Bilateral Political Consultation and Joint Ministerial Commissions.

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DEVELOPMENT WING

Development Wing of the Ministry of Climate Change consists of three sections/units which are responsible for performing a range of functions;

1. Development Section

The Development Wing is mandated to extend full support in discharge of official business allocated to Ministry of Climate Change under Rules of Business, 1973 through development projects. Presently, the Development Section is dealing with the following:-

1. Foresee and process allocation of funds in respect of PSDP projects of MoCC through M/o Planning, Development & Reform and Finance Division, the exercise of which starts in mid December every year.
2. Process work and cash plans of PSDP projects and get them approved from MoPD&R online through Project Monitoring and Evaluation System (PMES).
3. Process release of funds to PSDP projects quarterly.
4. Update PSDP projects information online through MoPD&R's PMES
5. Prepare consolidated financial expenditure statements and physical progress in r/o all PSDP projects for quarterly, half-yearly and full year review meetings as per requirements of M/o PD&R.
6. Prepare and consolidate material from PSDP project authorities for National Assembly/Senate Questions/Cut Motions etc as well as Year Book under Principles of Policy.
7. Prepare replies to the Federal Audit, Departmental Accounts Committee and Public Accounts Committee meeting regarding Appropriation Accounts and Audit Paras in r/o PSDP projects.
8. Process all administrative matters of PSDP projects like recruitment of project staff, processing of NOCs from the relevant forums, extensions in contract appointments as well as extension in project execution periods, etc.
9. Conduct internal monthly/quarterly review meetings in r/o PSDP projects.
10. Evaluate PC-Is & PC-IIs as per laid down process;
11. Process P-Is, PC-IIs (PSDP/Foreign Funded projects) for approval by the relevant forums i.e. DDWP, CDWP, ECNEC and NEC;
12. Formulate new PSDP on the basis of priority of projects aligned with mandate of CCD for submission to the Planning Commission;'
13. Process Work Plans and Cash Plans of approved PSDP projects with relevant forums;
14. Process PC-IV and V upon completion of projects with relevant forums;
15. Carry out internal monitoring of PSDP projects as and when required, for mid course correction, ensure timely execution and expenditures.

2. Council & Coord Section

The Council Section ensures smooth and transparent running of the parliamentary business. The council Section of M/o Climate Change ensures responsiveness to the best of its abilities. The performance of council section during the period 1st July 2020 to 30th June, 2021, includes the following functions;

1. Smooth functioning of parliament business related to the M/o Climate Change
2. Transparent flow of information/data/statistics to the parliament

3. Timely disposal of queries, motions, calling attention notices, amendment bills etc Effective and fruitful business during various standing committee meetings

The Council Section has successfully ensured timely disposal of all parliamentary business. Furthermore, all concerned departments have been sensitized regarding the importance of parliamentary business to ensure effectiveness of our vision. During the period 1st July 2020 to 30th June, 2021 this section has timely processed many amendment bills to the Parliament.

3. Finance & Accounts Section (F&A)

Finance & Accounts Section (F&A) is dealing with the following:

1. All work relating to Public Accounts Committee (PAC) and Audit observations on appropriation accounts and ensuring compliance of the Committee's observations and recommendations and verification of records from AGPR & Audit.
2. To arrange meetings of Departmental Accounts Committee (DAC) for settlement of outstanding paras of inspection reports of main Division and its attached departments.

Public Sector Development Programme (PSDP)

1. PSDP Project Titled, "Climate Resilient Urban Human Settlements Unit"

To ensure harmonized urban development at national level and to fulfil relevant international commitments of Federal Government, a dedicated mechanism to coordinate provincial urban settlements policies a Project has been established in MoCC with the cost of rupees 90.158 million. It will facilitate in translating and linking the provincial & local urban intervention with national scenarios after 18th amendment; and accordingly to synthesize efforts being made to counter the hard impact of unplanned and messy urbanization in the context of demography, economic, socio cultural and political arena. Therefore, to coordinate the Government of Pakistan's efforts regarding the environmentally sustainable urban development and human settlements at federal level, and to establish a ministerial-level mechanism to regularly report the sectoral progress & accomplishments, the present Project aims to establish a "Climate Resilient Urbanization".

Objectives:

I. To plan and implement the harmonized Action Plans for developing "Climate Resilient safe & Sustainable Cities", in collaboration with the Pakistan Urban Planning & Policy center at Ministry of PD&R (Planning, Development& Reforms); along with the UN-Habitat (Pakistan); all Provincial Urban Units; and the Line Departments of P&D; Local Governments; Housing & Urban Development of the Governments of Gilgat & Baltistan and the AJK.

II. To facilitate provincial urban units in launching community-motivated urbanization initiatives and in implementing urban projects; to facilitate their access to external funding with development partners and set aside international funds for adopting actions in developing Climate Resilient cities like the adaptation fund; Global Environment Facility and Green Climate Fund in addition to the increased Government's budgetary allocation.

III. To assist Pakistan Urban P&P Centre in Ministry of PD&R; in implementing Pakistan Vision 2025 strategic initiatives for transforming all urban human settlements into economic growth hubs and eco-

friendly sustainable cities through improved governance, effective urban planning, efficient mobility infrastructure, better security & community participation in collaboration with city governments.

IV. To develop and strengthen the capacity of city administrations to assess the emission targets and adopt low-carbon energy-efficient comprehensive Action Plans to convert their urban-heat islands into "Climate Resilient Cities", towards fulfilling international commitments of the federal government through the focal Ministry of Climate Change.

V. To strengthen the city governments' capacity in engaging the line departments and agencies and also the non-state actors to effectively meet the urban development challenges throughout Pakistan, as per the international obligations of Federal Government to meet the UNEP; UNFCCC & UN-Habitat targets under Rio+20 Declaration; New Urban Agenda; and SDGs.

VI. To strengthen institutional capacity of Provincial Urban Units; GB & AJK by augmenting their technical-knowledge& integrating their working mechanism to streamline future urbanization throughout Pakistan; thus enabling them to develop people-centered "Cities for Life", through efficient service-delivery based on information from an integrated Web-Net Databank of all human settlements scenario including the SDGs (i.e. rural-urban migration and demographics; urban poverty & land-use, GHG emissions& temperatures; informal slums, etc.).

Major Activities Performed during 2020-21.

Establishment of CRUHS Unit under the Ministry of Climate Change:

i. Draft "Pakistan Resilient Urban Policy Framework (adapting & mitigating the impact of climate change on cities 2020) has been prepared and is under consultation with the key stakeholders on Climate Resilient Urban Development.

ii. Streamlined SDG-11 (Sustainable cities & communities) to make cities inclusive, safe, resilient and sustainable in collaboration with stakeholders. Response is received from Sindh, Bureau Statistics Islamabad & Urban Policy and Strategic Unit Lahore; the information will be gathered and shared accordingly with SDG Unit established in Ministry of Planning Development and Special Initiatives.

iii. Development of web portal spurs to develop linkages with Provincial Urban Units.

2. <u>PSDP Project Titled, "Establishment of Geomatic Centre for Climate Change and Sustainable Development."</u>

Scope in Brief / Objectives:

1. Promote application of GIS, SRS and GPS technologies in assessing existing situation of forest, desertification, soil, climate, environmental pollution, marine life, coastal areas, snow and glacier, disasters, hazards, biodiversity, water resources, ecological zones.

2. Facilitate better environmental planning in the country, particularly for rational and scientific decision-making through assessment of environmental impact of different human activities, making them compatible with the objectives of sustainable development.

3. Enhance and upgrade institutional capacity Pak-EPA, Ministry of Climate Change in the use of SRS, GIS and GPS for environmental monitoring and management.

Achievements of objectives:

- Server room for data warehousing has established and application hosting at Geomatic center including purchase of server and repair of UPS etc. have been completed successfully.

- Establishment of LAN/WAN / client server environment in Pak-EPA building has accomplished.
- Development of customized web based application initiated.
- Revamping of Pak-EPA official website and content management and updating has been completed
- Automation software for EIA section of Pak-EPA has been build and installed.
- Acquired satellite images of different areas of Pakistan, processed them by performing spatial referencing and other functions as desired to extract information relevant to forestry, urbanization, hydrology, geography, air pollution etc. and presented in Digital Environmental Atlas of Islamabad. Digital Atlas of Islamabad contains;
  - Maps of physiography of Islamabad.
  - Maps of protected areas of Islamabad.
  - Maps of land use of Islamabad.
  - Maps of streams network of Islamabad.
  - Maps of CO_2 concentration of Islamabad.
  - Maps of geological hazards of Islamabad.
  - Maps of urban sprawl of Islamabad.
  - Maps of soil type of Islamabad.
  - Maps of vegetation cover of Islamabad.
- SRS data has been collected from Landsat 8, Geographic Information System (GIS) applications specifically NDVI, NDBI, classification, hydrological analysis, interpolation, IDW, etc. existing and historical situation of soil, climate, environmental pollution, snow and glacier, water resources, ecological zones has been extracted for Islamabad and few other areas to be presented in Atlas.
- Geomatic project has compiled the "**State of Environment Report"** successfully and provided an opportunity for the environmental policy maker to assess the state of environment continentally in a single document to achieve the goal of sustainable development. The State of Environment Report has been launched by the Secretary, Ministry of Climate Change in a seminar in 2019. The link of State of Environment Report is https://environment.gov.pk/Publications.
- Main server for the management of environmental data has been established.
- Fixed and mobile automatic ambient air quality monitoring stations has been repaired and calibrated with technical support of Geomatic staff, which were out of order since 2012. Now these stations are operational and daily ambient air quality report is being generated and disseminated with the public.
- Natural resource profile of environment in the form of Atlas has been completed.
- Maps of land use classification from 1990 to 2016 have been created by the Geomatic project staff and disseminated with major stakeholders, which provides clear information of the vegetation and urbanization cover portraying land use.
- Preparation and compilation of Environmental Atlas of Islamabad has been done in close collaboration with different public and private sector as well as relevant line departments and institution like PCRWR, Pakistan Meteorological Department, SUPARCO etc.
- Geomatic project has played a vital role for the strengthening of Pak-EPA not only in the field of SRS, GIS and GPS but in all mandatory activities of the agency. Geomatic project staff extended their technical expertise for Pak-EPA in the field of environmental sampling, monitoring and report writing during the project time frame.
- GIS laboratory established under Geomatic project is fully functional and sufficient to perform the environmental monitoring and management using GIS, RS and GPS.
- Geomatic project has enhanced the institutional capacity of Pak-EPA in many thematic areas of environment.

3. PSDP project titled, "Establishment of Pakistan WASH Strategic Planning and Coordination Cell (Facilitating Achievement of SDG 6.1 and 6.2)."

Sectorial Overview:

The UN Member States have principally agreed on the Post 2015 development agenda called the Sustainable Development Goals (SDGs). SDG 6.1 and 6.2 are directly related to WASH sector (water and sanitation) which are required to be met within stipulated time-frame as per laid down targets.

Ministry of Climate Change is mandated for WASH sector coordination at the federal level alongside with the responsibility of reporting progress and sustaining stakeholder dialogue including all federating units as well as international development partners. Necessitating establishment of a strategic planning and coordination unit. The present project aims to support establishment of such a unit at the federal level in Ministry of Climate Change. Once established, this Unit is expected to receive technical and material support from international development partners including UNICEF and The World Bank. Establishment of this Unit will facilitate and fast-track progress towards achievement of SDG 6.1 and 6.2 for following specific outputs:

1) Putting in place an effective coordination mechanism at national level involving all federating units and relevant development partners for developing harmonization, integration and synergies among key WASH stakeholders on WASH sector.
2) Promoting knowledge management, donor support, M&E, and periodic reporting mechanisms for SDGs 6.1 and 6.2 through close liaison with all federating units
3) Nurturing cross-sectoral linkages with other sectors (academia, private sector, CSOs working on themes of health, education, nutrition, DRM etc.) for putting in place a holistic approach for deepening and sustaining WASH sector reforms.

Under the project, in-house capacity of Ministry of Climate Change will be augmented to enable it perform its mandate in line with Federal Government's international commitments (including SWA,HLM, SACOSAN, SDGs attainment) in a technically sound manner, underscored by political consensus building and stakeholder collaboration. The Unit will also re-position Ministry of Climate Change to fully benefit from emerging national, regional and international deliberations and opportunities for augmenting and complimenting efforts of federating units for a robust institutional response to key WASH sector challenges in Pakistan. The Unit will also serve as federal level nerve center and jointly owned institutional platform for ensuring smooth collaboration and sustaining meaningful dialogue involving federal/provincial governments, civil society, private sector, academia and international development partners having stakes in WASH sector in Pakistan.

- Allocation for the year 2020-21:

1.	**Approved Cost**	40.00 Million (Local)	
2.	**Revised Cost:**	41.136 Million (Local)	
3.	**Allocation 2020-21**	**Allocation (Local)**	**Expenditure**
		Rs. 12.00 Million	**Rs. 9.082 Million**

1. Major activities performed during 2020-21:

WASH Sector Reform Agenda:

- Stakeholder Consultation Meeting to Define WASH Sector Reforms (Development of National WASH Programme) was held on 14th October, 2020. Report of the consultation meeting has been finalized and approved.
- Developed TORs relating to WASH Coordination Committee and Research Caucus. Consultation on the TORs has been completed with AJK, Punjab and Khyber Pakhtunkhwa.

Post Covid National WASH Programme:

- WASH Sector Reform Agenda has led to the development of an umbrella PC-I on Post-Covid National WASH Programme.
- A follow-up consultation was held with the provinces on 18th Feb, 2021 to finalize provincial PC-Is. A consolidated umbrella PC-I has been compiled and submitted to Planning Commission for approval through CDWP.

Stakeholder Consultation on SDG 6:

- Stakeholder Consultation Meeting on SDG 6 was held on 19th January, 2021 which was attended by representatives from all provinces and Pakistan Bureau of Statistics.
- Identification of capacity gaps for technical reporting and improving statistical capacities for collection and compilation of data in line in SDGs indicators by organizing stakeholder consultation meetings was finalized for the following:
    c. Establishment of Periodic Reporting Mechanism for Data Collection and Compilation.
    d. Development of Data Reporting Status of Respective SDG (6.1 & 6.2).

Clean Green Pakistan Index (CGPI):

- Twenty (20) selected cities in the two provinces (13 in Punjab and 07 in Khyber Pakhtunkhwa) have been ranked in terms of cleanliness and greenery standards in the 1st phase of CGPI. The pilot phase was concluded with the announcement of awards by the Prime Minister at the Encouragement Award Ceremony held on 19th October 2020.
- In the 2nd phase, CGPI has been rolled out in 93 cities across Pakistan.
- Third Party Monitoring for the 2nd phase will be conducted by GIZ and the Gates Foundation.

4. <u>PSDP project titled, "Sustainable Land Management to Combat Desertification in Pakistan (SLMP-II"</u>

SLMP-II project was approved by the CDWP in March 2015 at a total cost of Rs. 1666.695 million. The project started its operation from September, 2015. This project is an up-scaling phase of the SLMP pilot phase project to be implemented in 14 dry land districts in 4 provinces. It assisted the Government of Pakistan to achieve the long-term goal – "to combat land degradation and desertification in Pakistan" with the primary objective - "To promote sustainable management of land and natural resources in the arid and semi-arid regions of Pakistan in order to restore degraded ecosystems and their essential services, reduce poverty, and increase resilience to climate change". Integrated activities were performed in Agriculture, Forest, irrigation, livestock, rangelands and soil conservation/stabilization sectors.

Major Achievements / work done (2020-21)

The major achievements completed in the final year of the project are as under:

1. The capacity development activities covered almost 800 farmers and community activists along with 80 government officials with around 160 females.
2. Under the 2nd component of the program which is focused on development and implementation SLM land use planning and decision support system 40 village land use plans were completed in the target districts in the reporting period. This would help identify SMP constraints and potential solution to farmers, NGOs and line agencies and thus contribute in informed decision making for planning, monitoring and adapting climate resilient SLM practices and approaches.
3. The on ground activities completed mostly included formulation of CBOs substantial number of fruit and plant nurseries, introduction of SLM technologies woodlots, inlet structures / water conveyance system, hose fed irrigation, sprinkle irrigation, shelter belts, water diversion dykes, gate structures energy plantation, spill ways, water reservoirs and infrastructure such as the retaining walls with a total area around 82,000 Hectares in the reporting period. This was complimented by, Community nurseries, Dry afforestation, Rangeland Development and reseeding oasis forests, grazing management plans, fruit orchards with piped irrigation system and peter engine, afforestation, high yield fruit trees and low delta fruit nurseries covering a total of addition 35000 Hectares.

Detail of Project fund's donors is given below:

(Rs. In Millions)

GEF---UNDP	588.412
Government of Pakistan (Federal PSDP)	105.43
Government of Punjab (ADP)	191.214
Government of Sindh(ADP)	200.4
Government of KPK(ADP)	141.809
Govt. of Balochistan(ADP)	200.00
Community share (in kind)	239.430
G. Total	1666.695

5. PSDP project titled, "Ten Billion Tree Tsunami Programme, Phase -I, Up-Scaling of Green Pakistan Programme (Revised) (TBTTP)."

Introduction

The Ten Billion Tree Tsunami Programme, Phase -I, Up-Scaling of Green Pakistan Programme (Revised) (TBTTP) is a flagship programme of Government of Pakistan. The Ministry of Climate Change aims to plant/regenerate 3.296 billion plants with the cost of PKR 125.1843 billion during FY 2019-2023. The programme is being executed by Forest & Wildlife Department in all four Provinces and Federating units. The provincial Governments are sponsoring the programme on cost sharing basis (50:50), however the Federating units are being fully sponsored by Federal Government through PSDP funds. Ten Billion Tree Tsunami Programme (TBTTP) comprises of well-defined parameters for monitoring and evaluation of all programme activities for their successful implementation. Ten Billion Tree Tsunami Programme, Phase -1, Up-Scaling of Green Pakistan Programme (Revised) (TBTTP) is financed both by Annual Development Programme (ADP) and Public Sector Development Programme (PSDP).

Role & Function:

The main role & function of the programmeis to facilitate transition towards environmentally resilient Pakistan by mainstreaming notions of adaptation and mitigation through ecologically targeted initiatives covering afforestation, biodiversity conservation and enabling policy environment. The implementation of these plans shall be ensured through technical assistance of National Strategic Support Unit (NSSU) at Ministry of Climate Change. The programme has three components:

A) Enhancement of forest cover and management of plantations, State, Guzaraand Reserve Forests.
B) Biodiversity conservation and establishment of 725 acres of Zoo-cum Botanical Garden, Islamabad.
C) Institutional Strengthening of Zoological Survey of Pakistan

Goals & Targets

The physical and financial breakup of forestry component and respective share of provinces up till 30th June, 2023 is mentioned below;

Table 1:The Project Cost Estimates and physical targets (Federal and Provincial Break up) Forestry Component

Sr. No	Province/Territory	Cost per Plant (PKR)	Number of Plants (Billion)	PSDP Share (Billion Rs.)	ADP Share (Billion Rs.)	Total (Billion Rs.)
1	KP	27.34	1.00	13.67	13.67	27.34
2	Punjab	56.5	0.466	13.170	13.188	26.358
3	Sindh	5.5	1.000	2.699	2.900	5.599
4	Balochistan	166	0.100	8.356	8.332	16.688
5	AJK	35	0.560	19.284	0	19.284
6	GB	41	0.170	6.92	0	6.92
7	NSSU (MoCC)	-	0.00025	7.1913	0	7.19134
Total			**3.29625**	**71.29**	**38.09**	**109.38**

Achievements

Achievements of all provinces for FY 2020-21 is detailed in table 2.

Table2: Province/Territory Wise Physical and Financial Progress of Forestry Component, TBTTP FY 2020-21

S. No	Province	No. of Plants planted/ regenerated/ distributed (Figures in million)	Amount Released to Provinces (Figures in million)			Daily wagers engaged	Nursery Stock (Figures in million)
			PSDP	ADP	Total		
1	KP	223.9	1693.4	1490.7	3184.1	9507	142.91
2	Punjab	10.675	1140.2	1505.79	2645.99	11776	40
3	Sindh	231.36	818.6	223	1041.6	32892	6
4	Baluchistan	3.202	185.8	225	410.8	376	5
5	AJK	41.503	944.01	0	944.01	25973	52.38
6	GB	18.2	362.7	0	362.7	267	1.5
Total		**528.84**	**5144.71**	**3444.49**	**8589.2**	**80,791**	**247.79**

Table 3: Consolidated Physical and Financial Progress of Forestry Component, TBTTP FY 2019-20 and 2020-21

S.No.	Province	No. of Plants planted/ regenerated/ distributed FY 2019-20 (Figures in millions)	No. of Plants planted/ regenerated/ distributed FY 2020-21 (Figures in millions)	Total	Area in Hectare	Area in Acre	Amount Released to Provinces (Figures in millions)			Daily wagers engaged	Nursery Stock (Figures in millions)
							PSDP	ADP	Total		
1	KP	167.04	223.9	390.94	350,090	8,64,722	3778.96	3242.7	7021.66	30230	332.91
2	Punjab	58	10.675	68.675	25,124	62,056	3031.296	3429.797	6461.093	32781	85.237
3	Sindh	177.03	231.36	408.39	28,519	70,442	1259.43	664.47	1923.9	39392	148
4	Baluchistan	2.9	3.202	6.102	2,425	5,990	589.475	425.001	1014.476	17976	7.5
5	AJK	69.087	41.503	110.59	50,733	1,25,311	2167.764	0	2167.764	37844	121.46
6	GB	4.69	18.2	22.89	31,623	78,109	876.654	0	876.654	6267	6.182
Total		**478.747**	**528.84**	**1007.587**	**488,514**	**216,597**	**11,704**	**7,762**	**19,466**	**164490**	**701.289**

Vision of Ministry for the Sector

The Ten Billion Tree Tsunami Programme, Phase -I, Up-Scaling of Green Pakistan Programme (Revised) (TBTTP) is a flagship programme of Government of Pakistan. The Ministry of Climate Change aims to plant/regenerate 3.296 billion plants with an estimated cost of PKR 125.1843 billion during FY 2019-2023. The programme is being executed by Forest & Wildlife Departments in all four Provinces and Federal territories. It is an ecosystem restoration programme having components of forestry, wildlife and protected areas, hence covering all aspects of biodiversity conservation and rehabilitation, in Pakistan.

Base Line of the Sector

Provincial reports across the Pakistan were compiled informally through sharing of hard copies of progress reports on a prescribed proforma. Furthermore, the diversity of information required for the project outcomes was not being covered in the written feedback. Before the development of a national level forest monitoring system. The efficiency of reporting was getting affected due to late transmission of information. The National Forest Policy (2015) also envisaged that the federally sponsored programmes shall be regularly monitored and the forest cover shall be assessed periodically. The objective was to enhance efficiency and transparency of reporting process in the project.

Key Objectives

The main objective of the project is to facilitate transition towards environmentally resilient Pakistan by main streaming notions of adaptation and mitigation through ecologically targeted initiatives covering afforestation, biodiversity conservation and enabling policy environment. The implementation of these plans is expected to be attained through a well-coordinated and strongly monitored programme.

The programme has three components:

a. Enhancement of Forest Cover and management of plantations, state, guard and reserve forests.

b. Biodiversity Conservation and Establishment of 725 acres of Zoo-cum Botanical Garden, Islamabad.

Initiatives taken by the Ministry for the realization of the Vision

Ministry of Climate Change developed a robust digital reporting system to ensure the transparency of TBTTP activities. The system was developed by in-house development team of TBTTP with in a period of six months. This system is capable to capture all the activities including block plantation, linear plantation, assisted natural regeneration and nursery management system, performed under forest component of TBTTP. Ministry of Climate Change has successfully organized a detailed workshop to provide training on digital reporting system to all the DFOs across the Pakistan. TBTTP is currently developing a monitoring platform to ensure transparency of the programme. In this regard, GIS team of TBTTP developed a web-GIS monitoring portal which is capable to visualize the plantation sites geographically with detailed information of the site and processed satellite imagery of pre & post plantation status.

Updates on the Initiatives/Projects

- **a.** Development of Digital Progress Reporting System (DPRS) with 3 3 Modules i.e., Forest Reporting Module, Wildlife Reporting Module and Zoological Survey of Pakistan (ZSP) Module
- **b.** Development of WebGIS dashboard which is capable to visualize plantation sites with detailed their information on a map as well as satellite base analysis of pre & post plantation status.
- **c.** Provision of Plantation Sites Data (for FY 2020-21)
- **d.** Surveys conducted for Wildlife Species Mapping (i.e., Sindh Ibex, Afghan Urial, Punjab Urial and Chinkara)
- **e.** Institutional Collaboration with the SUPARCO for the monitoring of plantation activities, ground validation of plantation sites, provision of satellite imagery and capacity building of TBTTP staff regarding satellite imagery handling.
- **f.** In-house Change Detection Analysis of Plantation Sites.
- **g.** Apiculture Programme-Billion Tree Honey
- **h.** Organization of National Days i.e., World Environment Day 2021.
- **i.** Organization of National Events i.e. Plantation of Billionth Tree in Makhniyal and Spring Plantation Drive 2020-21, Monsoon Plantation Drive 2020-21.

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ATTACHED DEPARTMENTS AND AUTONOMOUS BODIES

PAKISTAN ENVIRONMENTAL PROTECTION AGENCY (PAK-EPA)

Pakistan Environmental Protection Agency (Pak-EPA) has been created under Pakistan Environmental Protection Act 1997 and is mandated for the protection, conservation, rehabilitation and improvement of environment, prevention and control of pollution, promotion of sustainable development and for matters connected therewith and incidental thereto. This Agency has 42 Officer/ Officials to complete the mandated functions.

The following major activities have been undertaken by three (03) directorates of this Agency during the year 2020-21. In order to efficiently carry out its mandated duties, Pak-EPA is organized into the following:

1) Directorate of Laboratory/National Environmental Quality Standards (Lab/NEQS)

   i. Polythene Bags Regulations, 2019
   ii. Hospital Waste Management Rules, 2005

2) Directorate of Environmental Impact Assessment/Monitoring (EIA/Monitoring)
3) Directorate of Administration/Legal/Enforcement (Admn/Legal)
4) National Biosafety Centre

1. LAB/ NEQS DIRECTORATE:

a) Introduction:

The Lab/NEQS directorate develops and implements the National Environmental Quality Standards (NEQS) for air and water, conducts air quality monitoring and tests water quality of reservoirs and filtration plant located in Islamabad. Lab/NEQS directorate collects, analyzes, reports, and maintains records of industrial and municipal effluents. Many other roles such as Inspecting/Monitoring of complaints regarding environmental issues, Issuing of Environmental Laboratory Certificate to different laboratories located in ICT, Monitoring of industrial sites/warehouses and controlling emissions, and providing facilities and assistance to research students of different universities as a supervisor in the field of Environmental Sciences. Significant Achievements of July 2020 –June 2021 are as follows:

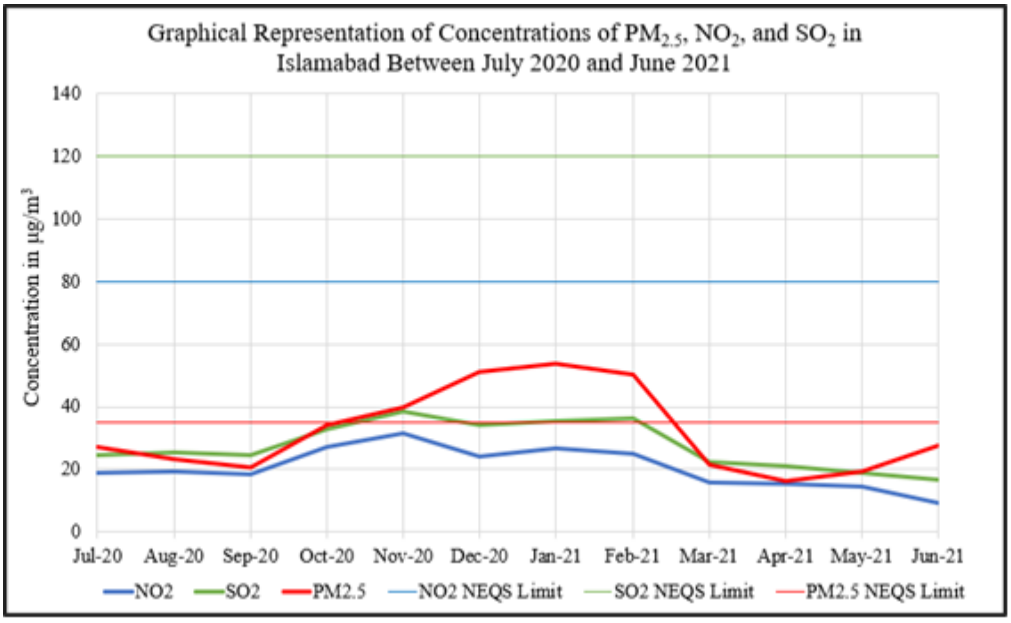
b) Activities, Role and Functions:

i. Air Quality

Lab/NEQS directorate prepared and reported daily air quality index. The latest and last month's air quality reports are available on the Pak-EPA website. A data surveillance room was established to monitor steel industries. Pak-EPA has established an active and reliable monitoring system to routinely monitor air emissions of steel, pharma, aluminium, food industries, brick kilns and construction sites. A fixed monitoring station is located at H-8, Islamabad. Data is gathered and analysed on 24-hourly basis and disseminated to the public through Pak-EPA website (www.environment.gov.pk) and official social media accounts. High concentrations of PM $_{2.5}$ were recorded in the winter months, i.e. December 2020 - 21 February due to smog season. Annual mean all air quality parameters are within NEQS limits.

Table no: 1. Annual Monthly Average July 2020 –June 2021:

Monthly average	**Temperature**	**Humidity**	**NO_2**	**SO_2**	**$PM_{2.5}$**
NEQS Value			***80 µg/m³***	***120 µg/m³***	***35 µg/m³***
Jul-2020	32.55	59.04	18.75	24.46	27.15
Aug-2020	32.85	69.45	19.08	25.59	23.08
Sep-2020	29	37	18.6	24.7	20.8
Oct-2020	26.03	29.13	26.93	32.84	34.21
Nov-2020	17.6	46.73	31.49	38.35	39.90
Dec-2020	10.8	66.09	24.19	34.23	51.11
Jan-2021	8.2	58.5	26.73	35.28	53.91
Feb-2021	14.13	44.82	24.8	36.3	50.32
Mar-2021	21.1	47.42	15.78	22.35	21.68
Apr-2021	23.3	49	15.5	21.21	16.318
May-2021	25.6	40	14.5	19	19.4
June 2021	32	36.8	9.4	16.54	20.33
Annual mean	22.76	48.67	20.48	27.57	31.51
PM	*Particulate Matter*				
NEQS:	*National Environmental Quality Standards*				



ii. **Water Quality**

Pak-EPA established an integrated surveillance system to monitor the Islamabad's natural streams and river.

Rawal Lake Catchment Area and Environmental Solution submitted to Honorable Supreme Court ordered dated 24.9.2020 and 23.11.2020 IN HRC 6465-G of 2017 to come up with water analysis report of Rawal Lake waters (Korang River) and identify the sources of water contamination of Korang River. In this regard report has been prepared.

Pak EPA Lab/NEQS directorate July 2020 to June 2021 collected eight two (82) water samples and tested in EPA laboratory. In April -May 2021 during Ramazan carried out chemical and microbiological analysis of drinking water samples collected from twenty-five (25) CDA filtration water plants in ICT. Pak-EPA also collected surface-water samples from natural water bodies (Rawal Lake, Simly Dam, Soan River, Korang River, etc.) in ICT. Pak-EPA also established an Integrated Surveillance System to monitor the Islamabad's natural streams and rivers water samples were collected and analysed, along with waste water samples from industries, nalah and sewerage system of ICT.

Five (5) Bore water samples collected from (Barakahu). Under constructed waste water treatment plant visited in industries. Two industries installed new WWTP in Kahuta triangle, 10 environmental industries/sites visited to check Environmental Management Plan status. Director General, Pak-EPA and Dy.Director Lab visited the wah gardens on 29.10.2020 along with Mr. Amin Baig Dy. Director Rawalpindi from PEPD. The purpose of the visits was to check and observe the issue raised by Public complaints regarding sewerage water contamination and dumping of waste in the wah garden water premises pond and water channels, and damaging the natural surrounding environment. Pak-EPA collected eight (8) water samples from wah garden.

iii. **Technical Ttraining, Tesearch Facilities and Internships:**

Lab/NEQS directorate has provided technical training, research facilities and summer internships to about 105 students of various universities during July 2020 –June 2021. PhD, MS level students conducted their water and air quality assessment research with help of EPA generated data, government public environmental policy and BS and BE level students enrolled for their essential summer internship. During internship students, attended EIA public hearing, visited industries/site along with EPA team. PhD student from Tsinghua Chinese University Beijing conducted traffic and air quality monitoring Islamabad to Khunjerab pass under supervision of Pak EPA.

iv. **Environmental Laboratory Certification:**

According to Certification of Environmental Laboratories Regulations, 2000. Pak EPA has been certified four environmental laboratories in ICT as per regulations. The Lab/NEQS directorate has visited the laboratory before approval and checked equipment working space and mobile stations of environmental laboratories. Every year EPA issued renewal certificate after environmental audit of lab. Private Environmental Laboratory supports the environmental protection functions of state government by performing chemical, bacteriological and radiological analyses of environmental samples including drinking water, surface water, waste water, sediment, air, fish, soil and hazardous waste. EPA Approved environmental labs list is placed at EPA website for public and industries convenience.

v. **Hospital Waste Management**

During the 2020-2021, 58 major health facilities were visited to ensure the compliance of Hospital Waste Management Rules, 2005 within the jurisdiction of Islamabad Capital Territory (ICT). Also, 18 healthcare facilities were served legal notices for violation of Hospital Waste Management Rules, 2005.

During the novel coronavirus epidemic spread, Pak EPA tackled the public health safety on priority. Pak EPA ensured that medical waste collected from COVID-19 designated hospitals in ICT, should immediately be transported to a designated place for hazard-free disposal, as a part of the efforts to control the spread of the disease

vi. **Ban on Polythene Plastic Bags in Islamabad Capital Territory:**

In order to curb plastic pollution, Pakistan Environmental Protection Agency imposed a ban on polythene plastic bags in Islamabad Capital Territory vide SRO. No.92 (KE)/219, dated 22nd July, 2019. Due to surge of COVID-19 pandemic, compliance and enforcement of the Regulations was slowed down in light of health and safety concerns. Furthermore, given the impact of the pandemic on local traders and economy, fines and penalties were restricted. Nevertheless, awareness raising efforts were carried out by Pak-EPA to sensitize public and shopkeepers about negative impacts of polythene bags. During this time, about 3300 Kgs polythene plastic bags were confiscated, and Rs. 475,000/- were imposed as fines/penalties on violators of the Regulations. Polyethane supplier submitted re cycling plan for allowed polyethane bags, three authorizations issued.

vii. **Public Complaints and Field Monitoring:**

More than 300 public complaints were addressed by Pak-EPA. The public complaints and grievances were received at Pak-EPA office, as well as through Pakistan Citizen's Portal. Given the nature of complaints, field monitoring and inspections were carried out to a limited extent, due to the COVID-19 pandemic. In some cases, legal proceedings were also initiated against violators.

viii. **Brick Kilns Pollution Control:**

Emission from Brick Kilns is also one of the main factors which trigger higher atmospheric levels of pollutants in ICT. Taking the extent of air pollution into consideration, Environmental Monitoring Team (EMT) regularly visits the Brick Kilns of ICT and ensure the compliance of section 11 of Pakistan Environmental Protection Act, 1997 and National Environmental Quality Standards notified thereunder. Currently, 15 out of 63 brick kilns have now turned over their kilns on newly environment friendly Zig-Zag technology and other brick kiln owners are keen to switch over all the rest brick kilns from conventional to new technology in order to conserve the environment.

ix. **World Environment Day, 5th June 2021:**

The world environment day is celebrated globally every year on 5th June to raise awareness about the environment. This year Pakistan is the official host country of the world day, the theme of which was "ecosystem restoration". In commemoration of world environment day, Pakistan environmental protection agency (Pak- EPA) organized caravan e mahol in Islamabad. The public campaign kicked off from zero point and ended at D chowk after touring through Islamabad. The environmental caravan included 03 road shows focused on ecosystem restoration, sustainable urban development, and plastic pollution. For This purpose, floats demonstrating solutions to these problems such as sustainable construction and recycling of waste, cruised through the city, with the destination of D-Chowk. Officials of Pak-EPA and members of Pakistan Boy Scouts Association lead the convoy. Ministry of Climate Change, IG Islamabad, Islamabad Traffic Police, District Administration and all the stakeholders of the environment in the capital joined hands to celebrate this event. The public was encouraged to join the march, learn more about leading environmental issues, their solutions, and to help spread awareness.


Say no to resource exploitation
Yes to sustainable consumption
PAKISTAN BOY SCOUTS ASSOCIATION
NATIONAL HEAD QUARTERS

c) **Goals and Targets:**

i. Process and Finalization of draft hazardous waste/substances rules.
ii. Finalization of Persistent Organic Pollutants (POPs) regulation.
iii. Process, Implementation and notifications of Euro III, IV and V standards.
iv. AQMS and water Lab upgradation under Plan project.
v. Number of industries for Self-Monitoring and Reporting will increase.
vi. Establishment for Self-Monitoring and Reporting Tools (SMART) system for Hospital Waste Management through development of Dashboard / Mobile App.
vii. Revision of HOSPITAL (Waste Management Rules) HWM Rules, 2005.

d) **Achievements:**

i. Annual mean of all air quality parameters are within NEQS limits specially $PM_{2.5}$ is 31.51 µg/m³.
ii. Two Industries installed waste water treatment plant in kahuta.
iii. Number of industries and hospitals/health facilities self-reporting to EPA is increased.

2. **Directorate of Environmental Impact Assessment (EIA/IEE):**

a) Introduction:

Initial Environmental Examination (IEE) is an important tool for incorporating environmental concerns at the project level. IEE is carried out as early at the project planning stage as part of feasibility thus it can assure that the project will be environmental feasible.

Environmental Impact Assessment (EIA) is a systematic and integrative process for considering possible impacts prior to a decision being taken on whether or not a proposal should be given approval to proceed. It is an environmental decision support too, which provides information on the likely impacts of development projects to those who take the decision as to whether the project should be authorized. Pak-EPA has imposed Rs. 3,700,000/- administrative penalty on different project proponents who have illegally established their projects without seeking the Environmental Approval from Pak-EPA, and thus contravened the provisions of PEP Act, 1997.

b) Activities, Role and Functions:

During the period 01-07-2020 to 30-06-2021, Twelve (12) Initial Environmental Examination (IEE) Reports have been received for review at this Agency, Two (02) Environmental Approvals have been granted, Five (05) cases are under process and Five (05) cases have been rejected.

During the same period Fourteen (29) Environmental Impact Assessment (EIA) Reports have been received for review at this Agency, ten (10) environmental approvals have been issued, Eighteen (18) cases are under process and One (01) case has been rejected. Twelve (12) Public Hearings have also been conducted.

One (01) case of Petrol Pump has been received, which is under process:

c) Goals and Targets:

i. Revision and notification of the existing regulations by updating the project classification under different schedules and introduction of proforma-based approvals for smaller projects.

ii. Provision of financial resource to carryout review of reports by review committee members/experts.

d) Achievements:

Ten (10) environmental approvals have been issued in 2020-2021.

3. **Directorate of Legal /Enforcement**

a) Introduction:

Pakistan Environmental Protection Agency (PAK-EPA) is a statutory body established under Section 5 of the Pakistan Environmental Protection Act, 1997 for enforcement of Environmental Laws, Rules and Regulations made under the Act.

b) Activities, Role and Functions:

According to PEP Act, 1997 the activities/role & functions of legal/enforcement directorate of Pak-EPA are following:

i. Draft and prepare reports and parawise comments and defend the cases before Hon'ble Supreme Court of Pakistan.
ii. Prepare appeals, reports and parawise comments and represent this Agency before Hon'ble High Courts.
iii. prepare cases/complaints for Environmental Tribunal/Environmental Magistrate and appear, act and plead as prosecutor in Environmental cases before Environmental Tribunal and Environmental Magistrate.
iv. Appear and defend this Agency before Hon'ble Wafaqi Mohtasib.
v. Appear and represent this Agency before Human Rights Commission of Pakistan;
vi. Appear and plead the cases of this Agency before lower courts.

Moreover, the legal/enforcement directorate of Pakistan Environmental Protection Agency are defending, prosecuting and representing the cases of criminal as well civil nature before different Courts of law and forums.

c) Goals and Targets:

i. Finalization of EIA Regulations, 2021.
ii. Hazardous Substance Rules, 2021.
iii. E-Waste Rules, 2021.

d) Achievements:

i. Finalized and notified the Pakistan Environmental Protection Agency Ban on (Manufacturing, Import, Sale, Purchase, Storage and Usage) Polythene Bags Regulations, 2019 after approval of Federal Cabinet.
ii. Approximately 300 field visits conducted by the Enforcement Team(s) of Pak-EPA for the implementation of Pak-EPA Ban on Polythene Bags Regulations, 2019.
iii. Approximately six-hundred thousand rupees. 6,000,00/- fine imposed upon accused persons on infringement of Pak-EPA Ban on Polythene Bags Regulations, 2019.
iv. 205 notices of personal hearing/notices of compliance served upon Brick Kilns, Hospitals, Industries, users of Polythene Bags under Pakistan Environmental Protection Act, 1997.
v. 64 Environmental Protection Orders issued including Brick Kilns, Steel Industries, Shops, Housing Societies, Hospitals.

vi. 10 Brick Kilns sealed for non-compliance of PEP Act,1997 NEQS & Environmental Protection Orders.
vii. 10 Cases/Complaints filed in Environmental Protection Tribunal on violation of Environmental Laws.
viii. Administrative penalty imposed by Pak-EPA upon violators 1700000/- (1.7 million).
ix. 18 Reply/Parawise comments submitted in Hon'ble High Courts in different Writ Petitions/Appeals relating to Environmental Issues.
x. 03 Reports submitted before Hon'ble Supreme Court of Pakistan on the directions of Hon'ble Court.

Enforcement against Polythene Bags Regulations Action against Asphalt Plant

4. FUNCTION AND PROGRESS OF NATIONAL BIOSAFETY CENTRE (NBC)

a) Introduction

Pakistan is a party to the Cartagena Protocol on Biosafety (CPB) under Convention on Biological Diversity (CBD) since May 31, 2009. It is obligatory for member countries to devise implementation mechanism for regulating Genetically Modified Organisms (GMOs) and their products. National Biosafety Centre (NBC) under a development project was established at Pak-EPA in April, 2006 for a period of 5 years. In exercise of the powers conferred by section 31 of Pakistan Environmental Protection Act (PEPA) 1997, Pak-EPA drafted and notified Pakistan Biosafety Rules vide S.R.O. 336 (1)/2005 on 21st April, 2005 to provide legal cover for regulating Genetically Modified Organisms (GMOs). National Biosafety Guidelines were notified in October 2005 for the facilitation of the applicants to follow the procedures for the implementation of the Biosafety Rules in the country. Approval process for the Genetically Modified Organisms (GMOs) involves three tiers of forum i.e.

i. Institutional Biosafety Committee (IBC), Chaired by Head of Institution.
ii. Technical Advisory Committee (TAC), Chaired by DG Pak-EPA, Islamabad.
iii. National Biosafety Committee (NBC), Chaired by Secretary, MoCC, Islamabad.

b) Activities, Role and Functions:

The 28th meeting of Technical Advisory Committee (TAC) of Biosafety was convened in the committee room of M/s Four Brothers Chemical (Pvt.) Limited, 22 km Ferozepur Road, Lahore on 16th March, 2021. The meeting was chaired by Ms. Farzana Altaf Shah, Director General, Pakistan Environmental Protection Agency, Islamabad. In the meeting a total, four (04) cases of Genetically Modified Organisms (GMOs) related activities were reviewed and recommended for the approval of National Biosafety Committee (NBC).

The 23rd meeting of National Biosafety Committee (NBC) was convened on 15th April, 2021 in the committee room of Ministry of Climate Change, Islamabad. Ms. Naheed S. Durrani the Secretary, Ministry of Climate Change / Chairperson NBC chaired the meeting. The meeting started with recitation from Holy Quran. The chairperson welcomed the members of the committee who were online participating the meeting due to Covid-19 issue. The chairperson appreciated the efforts of Pak-EPA to streamline the activities of

biosafety centre keeping in view the constraints of limited financial and human resource at the Agency. Total four (04) cases of Genetically Modified Organisms (GMOs) related activities were discussed and decided in the meeting.

c) Major Achievements

i. Development of Pakistan's first hexa-gene whitefly resistant cotton.
ii. Development of Pakistan's first triple-gene cotton.
iii. Development of advanced herbicide resistant cotton.
iv. Development of pink-free cotton.
v. Acquired patents from intellectual property organization of Pakistan (IPO-Pakistan; Patent numbers 143139, 143167, 143200, 143138, and 142468) in addition to 16 countries worldwide which include USA, China, India and other Central Asian states.

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ZOOLOGICAL SURVEY OF PAKISTAN

Zoological Survey of Pakistan (ZSP) is one of the key Federal Agency involved in policy making for wildlife conservation in the country. The mandate of ZSP is to monitor the current status and distribution of wildlife of Pakistan. Besides these objectives, ZSP is also mandated to maintain standard zoological collections for reference from different parts of the country and impart education and raise awareness among masses for biodiversity conservation.

The specific objectives of Zoological Survey of Pakistan are as follows:

- To obtain information on distribution, population dynamics and status of animal life in the country.
- To undertake research on the ecology and biology of wild populations of Pakistan.
- To set up and maintain standard zoological collections for reference.
- To advise the Government on all zoological matters, including conservation, management and trade in wildlife.
- To impart training and create public awareness about wildlife conservation.

ACHIEVEMENTS OF ZOOLOGICAL SURVEY OF PAKISTAN DURING 2020-21

General Studies of Department

Avifaunal studies of District Tharparkar, Sindh

ZSP is involved in baseline faunal studies of district Tharparkar, Sindh in collaboration of IUCN-Pakistan. The studies are continued.

Survey of Punjab Urial

Survey of Punjab Urial was conducted during 2020-2021 with Punjab Wildlife Department

Annual Mid-Winter Waterfowl Census

Mid-winter waterfowl census is an annual activity of the department since 1982. The surveys were carried-out in the second week of January. During the current FY (2020-21), following wetlands of Punjab and Sindh were visited for waterfowl census:

P**unjab**: Kalarkahar Lake, Namal Lake, Chashma and Jinnah Barrages, Ucchali Wetlands Complex, Head Marrala, Head Qadirabad and Rsul Barrage.

Sindh: Runn of Kuch, Kajrasar Dam, Ranpur Dam, Sindhuri Dam , Sakkar Dam, Sangha Lake, Bodesar Lake , Nurri Lake, Phoosana Lake, Hudero and Haleji Lake, Ach Dhand , Manchar Lake, Lungh Lake, Drigh Lake, Hammal Lake.

Results of Wetlands of Sindh

During the current waterfowl census total of 190,000 water birds belonging to 70 species of both migratory and resident birds were recorded from different wetlands of Sindh.

The Nurri lake was observed most populated with water birds numbering (55000) birds followed by Manchar lake (29000) birds and Haleji Lake (28000) birds.

Common Coot (*Fulica atra*) was observed most abundant migratory bird with total number of (54000) individual birds followed by Common Teal (*Anas crecca*) with number of (46000) birds, while Ruddy Schelduck and Common Shelduck were observed less abundant or rare migratory bird species numbering 2 birds of each species at Nurri Lake.

Results of Wetlands of Punjab

During the current annual mid-winter waterfowl, census total of 65,000 number of water birds including both migratory and resident were recorded at all the important wetlands of Punjab. These consist of 62 species at the surveyed wetlands. Chashma Barrage had the largest population of both migratory and resident water birds numbering (36,000), followed by Ucchali lake (7,000 birds), while Khabekki lake was least populated i.e. (274**)** birds only.

The Common Coot (*Fulica atra*) was found most abundant species with highest population also during the current census at the wetlands of Punjab, i.e. 24,000 individual birds. While, Red Crested Pochard (*Netta rufina)* was found second abundant (8,900) birds at the wetlands followed by Common teal (*Anas crecca*) 5,300 birds.

Conclusion:

During the current mid-winter waterfowl census of 2021, a total of 256,000 water birds including both migratory and resident water birds were recorded from both the provinces Punjab and Sindh.

Aerial Seeding of Seed Balls at Zoo-Cum-Botanical Garden (ZCBG), Bani Gala, Islamabad

Zoological Survey of Pakistan and MOCC in collaboration with Private Sector introduced aerial seeding for the first time in Pakistan at Zoo-Cum-Botanical Garden, Islamabad. Seed balls were developed and broadcasted in the field. Under this phase-wise programme, it was decided to introduce seeds of the native plant species at ZCBG. About six million seed balls of three native species (*Acacia modesta, Acacia nilotica and Epil epil*) were successfully thrown by helicopter in the field in first phase. Based on the field surveys after the activity, it is estimated that nearly 15% of seeds are growing and it is hope that the percentage of survival will increase if favorable weather conditions persist. This initiative was accomplished to make Pakistan green under the vision of Prime Minister of Pakistan.

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GLOBAL CHANGE IMPACT STUDIES CENTRE (GCISC)

(A Body Corporate established under the GCISC Act 2013)

1. INTRODUCTION

Being cognizant of the fact that Climate change is a stark reality and no more a fiction and Pakistan cannot remain secluded from the adverse impacts of this global concern, Global Change Impact Studies Centre (GCISC) was established as a dedicated research Centre to address climate change issues in 2002 with seed money provided by the Ministry of Science & Technology. From July 2003 to September 2009 GCISC was supported by the Pakistan Planning Commission under its Public Sector Development Programme and thereafter by the Ministry of Environment from its development funds.

The status of Body Corporate was granted to the Centre under the GCISC Act notified through Gazette of Pakistan on March 26, 2013. According to the act, the Centre is a body corporate working under Ministry of Climate Change, as its research arm. The Centre is run through a high level 28-member Board of Governors (BoG). Minister-in-Charge of Climate Change serves as the Chairman of BoG whereas Secretary Ministry of Climate Change is the Vice Chairman.

The Centre is mandated to undertake scientific investigations of the phenomenon of climate change at regional and sub-regional levels and study its impact on various sectors of socio-economic development in order to prepare the country to meet threats to its water resources, agriculture, ecology, energy, health, bio-diversity etc.

2. ROLES & FUNCTIONS

Under the GCISC Act, the Centre is tasked with three functions, namely research, capacity building, and 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

RESEARCH

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

I. Climatology & Environment Section

- Assessment of past climatic changes;
- Development of future climate projections for Pakistan by employing state-of-the-art high resolution Climate Models;
- Scientific Investigation and Prediction of Climatic Extremes by using modeling as well as statistical techniques;
- Simulation modeling to study monsoon dynamics and its associated impacts;
- Intra seasonal to inter decadal climate predictions;
- Development & Updating of GHG Inventory of Pakistan for Energy & Industrial Processes Sectors;
- Research dissemination (International and national science journals and books, newspaper articles, policy briefs, etc)
- Capacity building and awareness raising

II. Water Resources & Glaciology Section

- Application of Machine Learning and Artificial Intelligence (AI) techniques to model Indus River System flows;
- Climate change analysis for the high elevation Karakoram region;
- Drought prediction in the Indus Basin as a climate adaptation strategy;
- Spatio-temporal assessment of climate change impacts on the UIB- cryosphere and variability of flows;
- Analysis of climate impact on the frequency and intensity of hydrological extreme events;
- Plausible Adaptation strategies in line with national Climate change and Water policies to ensure country's water security.
- Research dissemination (International and national science journals and books, newspaper articles, policy briefs, etc)
- Capacity building and awareness raising

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

During the year, GCISC made significant contributions to the international scientific literature in the field of climate change and its associated impacts, and provided tangible inputs in a no. of research projects. It also organized a no. of workshops/seminars for information dissemination and awareness.

The following is a summary of the accomplishments in 2020-21:

- National Greenhouse Gas Inventory (2017-18) prepared by GCISC was approved by Prime Minister's committee on Climate Change (PMCCC)
- Publication of key research findings in scientific journals = 19
- Contribution towards technical reports = 10
- Contributions in research projects = 6
- Organization of scientific activities/workshops/seminars for information dissemination and awareness = 11
- 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) = 23
- Provision of training to university students across Pakistan in the field of climate change through internship program = 16
- GCISC experts delivered lectures as resource persons and imparted trainings to the researchers of various organizations = 18
- Muhammad Arif Goheer, Principal Scientific Officer/ Head- Agriculture and Coordination served as Chair in UNFCCC's Consultative Group of Experts(CGE) which provides technical support and advice, consistent with its mandate, to developing country Parties that responds to their technical assistance needs to implement, in a timely manner, the existing MRV arrangements under the Convention and the ETF under the Paris Agreement, including putting in place sustainable institutional arrangements and data management systems.
- Contributions to Pakistan's 1st Biennial Update Report to be submitted to UNFCCC by Ministry of Climate Change, Government of Pakistan.
- Two scientists from GCISC contributed as Lead Authors to the IPCC 6th Assessment Report.
- One GCISC scientist contributed as "Reviewer" to the GEO report on Cities.

- One GCISC scientists contributed as “Technical Reviewer” in the UNEP’s Global Methane Assessment Report released in January 2021.
- GCISC is serving as the Secretariat of NDC and its scientists have contributed to the deliberations of working groups under Technical Committee on Adaptation and Mitigation.

5. ACHIEVEMENTS & SALIENT RESEARCH FINDINGS

A) Research

a) Future climatic changes, extreme events, related uncertainties and policy recommendations over Hindu Kush sub-regions of Pakistan

The study explores relative changes and future projections of temperature and precipitation for baseline (1976-2005) and future (2006–2040, 2041–2070 and 2071–2100) periods for Bajaur, Mohmand and Khyber districts of Pakistan situated in the Hindu Kush region based on 14 GCMs (out of which five GCMs were selected based on evaluation and validation) and three RCMs. The future extremes were projected by using standard indices of Expert Team on Climate Change Detection and Indices (ETCCDI).

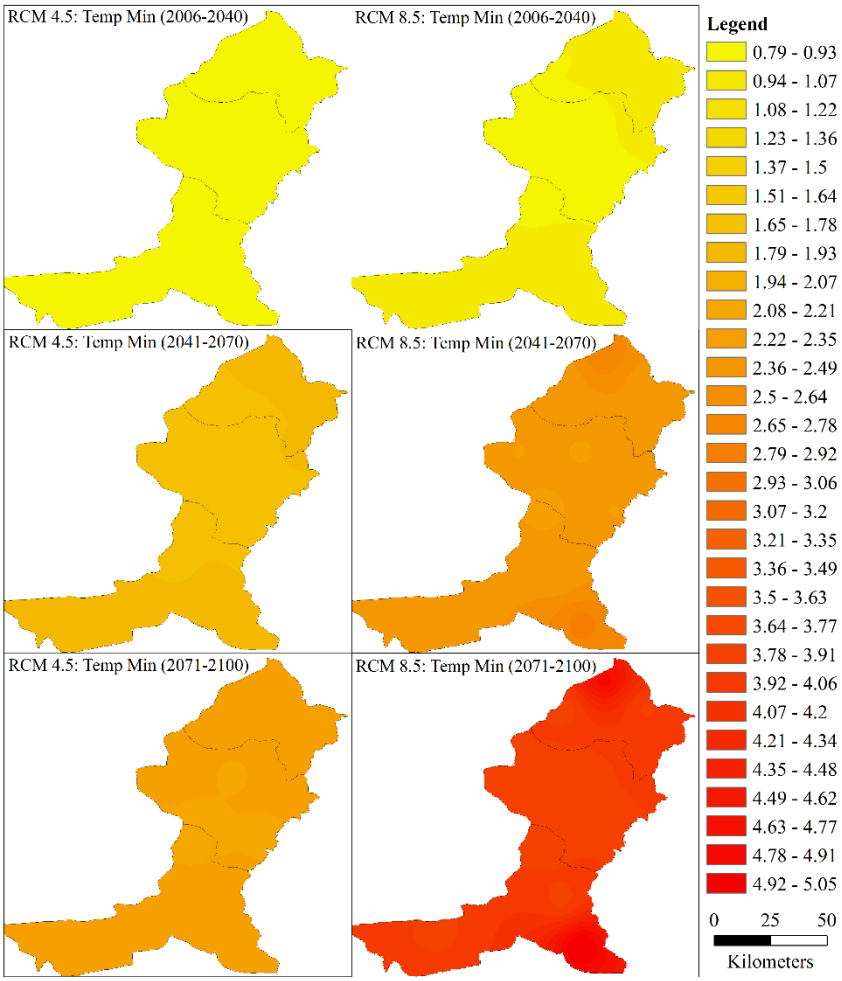

Figure: *03 RCMs ensemble projections for average minimum temperatures for the periods: F1 (2006-2040), F2 (2041-2070) and F3 (2071-2100) under RCP4.5 and RCP8.5*

For RCP4.5, GCMs and RCMs projections show an increase in average maximum temperature to 0.98 °C for 2006-2040, 1.89 °C and 2.04 °C for 2041-2070 and 2.25 °C and 2.56 °C for 2071-2100 while it is almost double for RCP8.5 during last period (2071-2099) over whole study area respectively. The percentage increase in precipitation for RCP4.5 is 10.00%-17.00% and 21.14%-34.47% for GCMs and RCMs while for RCP8.5 it is 11.73%-22.12% and 16.17%-31.50% respectively over the whole study area. In terms of extreme events, warm temperature extremes and extreme precipitation events show an increasing trend accompanied by a decrease in cold extremes over all the regions. Hence, it is concluded that warm and wet condition are projected to prevail in overall regions.

b) Spatio-Temporal Variability of Summer Monsoon Onset over Pakistan

This study focuses on prediction of moon onset and associated rainfall. Mean monsoon onset has observed a shift over 40 years to an earlier time from first week of July to last week of June at most of the stations in Pakistan. Total amount of precipitation has decreased during the onset period has decreased after 1970's in almost all regions. North eastern region of Pakistan received highest amount of precipitation among all others. This study is useful for policy making and associated planning purposes, as the variability in monsoon rainfall has huge impact on the socio-economic sectors and enhanced predictability of rainfall can help in better planning of water resource management for agricultural sector.

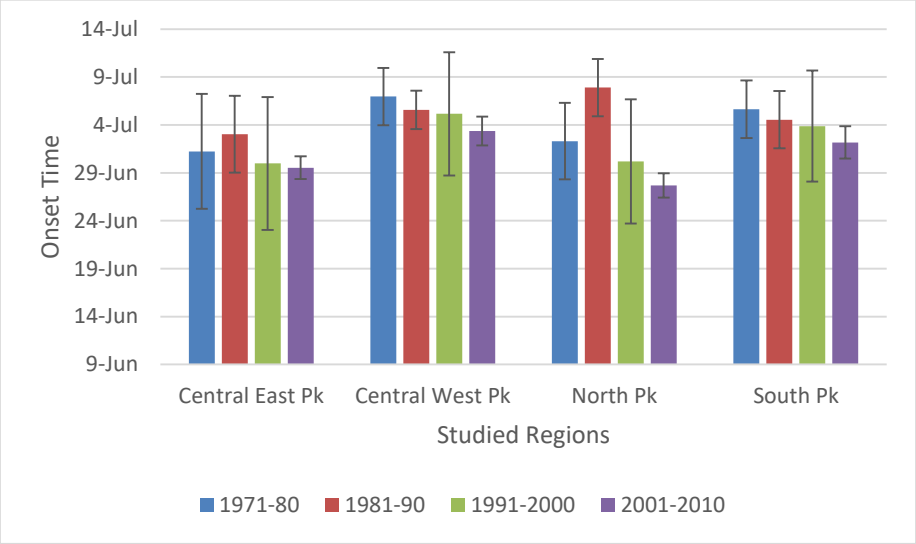

Figure: *Trend of monsoon onset over four regions of Pakistan from 1971-2010*

c) Future Extremes and Variability of Rainfall over Monsoon Region of Pakistan

The results generally reveal that the temporal variability of rainfall in the selected region is projected to decrease till the end of this century under both RCPs. Owing this decrease in variability, alteration in river flows may have an impact on yield of many crops. As heavy rainfall over consecutive days can create the flood conditions, therefore, RX5day is usually defined as a potential flood risk index. Increase of this index is projected to be 117.50mm (109mm in base period) by the end of this century under RCP 8.5 which indicates the risk of flooding in future over monsoon region of the country.

d) Data-Driven Machine learning semi distributed model for ten daily streamflow modelling in the Upper Indus Basin Catchment

Machine learning methods for hydrological modeling have seen extensive development over the last few decades and been proposed as a useful complement to physical hydrologic models, particularly in basins where data to support process-based models are limited. Despite the encouraging results, most applications of machine learning for streamflow forecast have been limited to watersheds where rainfall is the major source of runoff. In this study, we have developed XGBoost (*eXtreme Gradient Boosting*) model in Python, to make streamflow forecast at 10-day lead time at Indus Catchment. The catchment has varied contributions of rainfall and snowmelt to its streamflow. The model produced exceptional results on test data with NSE value as high as 0.90. Thus, it suggests that XGBoost is better suited in watersheds where streamflow contributions come from a mix of snowmelt and rainfall. Moreover, SHapley Additive exPlanations (SHAP) method is used in this study for the analysis of feature importance, that provides detailed insights into the impact of individual feature (parameter/predictor) on the prediction of streamflow.

e) The Impacts of Climate Variability on Crop Yields and Irrigation Water Demand in South Asia

The objective of this study was to improve understanding of the impact of inter-annual climate variability on crop yields and crop water demand from irrigation in selected study sites of the IGB river basins in South Asia during the historical period 1981–2010.Results of this study confirm the importance of climate-related assessments in crop yields and irrigation water demand at higher spatial (grid cell aggregated over study sites area) and temporal (crop phenological phases) scales. The results confirm that climate variables (i.e., temperature and precipitation) play a major role in crop development and growth. However, the degree of crop yield relationship strength with climate variables varies largely between seasons and among locations. Crop yields (i.e., wheat and rice) show very low sensitivity to climate variables (i.e., up to 4% to temperatures and up to 21% to precipitation) when assessed at the province and state level using observed yield and climatic data. However, crop yield showed a little higher sensitivity to temperature (up to 32%) and precipitation (up to 20%) variations at higher spatial scale i.e., districts level in Punjab Pakistan.

Simulated wheat and rice yields at 5 arc-min spatial resolution aggregated over selected study sites show that 27–72% variations in wheat and 17–55% variations in rice yields are linked with temperature variations in the Rabi and Kharif cropping seasons, respectively. In the absence of irrigation application, precipitation variations also play a major role, i.e., up to 39% variations in wheat yield and up to 75% variations in rice yield are directly linked with precipitation changes in the IGB river basins. Statistically significant and strong negative correlations between temperature and wheat yield indicate that wheat crop is quite vulnerable to heat stress. Kharif precipitation shows a statistically strong and positive relationship with rice yield production, indicating that a change in monsoon onset and uncertain climate extremes can impact the rice yield productivity.

The study concluded that wheat yields are most vulnerable to increasing winter temperatures in the reproductive phase. In the absence of irrigation application, both wheat and rice crop yields show mainly a significant positive relationship with crop phase-specific precipitation for all study sites with the strongest correlation, however with a large range, during the reproductive phase −0.12 to 0.75 for wheat

and −0.18 to 0.77 for rice. Our analysis confirms that the crop yield sensitivity to climate variables depends on time and space specific climatic conditions.

Timing and quantity of irrigation water demand are also strongly associated with the variations in temperature and precipitation. We observed that irrigation water demand by both wheat and rice are generally positively correlated with temperature in both climate-sensitive crop phases with an exception during the reproductive phase of wheat where it shows a mixture (both positive and negative) of correlations for different locations. Whereas, crop phase-specific irrigation water demand by both crops show a negative relationship with precipitation i.e., under increased precipitation scenarios, decreased irrigation projections are expected. This study shows that crop phase specific climate variables play a major role in crop yield fluctuations within and between the years and also drive irrigation water demand in quantity and time. Therefore, improved knowledge on the shifts in irrigation water availability and demand based on local soil and climate conditions during sensitive crop growth phases and possible impacts on crop yields of rice and wheat in the IGB river basin will support adaptation strategies to cope with projected climate change and socio-economic scenarios.

f) Future changes in growing degree days of wheat crop in Pakistan as simulated in CORDEX South Asia experiments

This study was designed to assess the increasing daily maximum as well as minimum temperatures and to determine the impacts of rising daily mean temperature on heat requirements of wheat crop in wheat-growing zones all over Pakistan. The study applies RCP 4.5 and RCP 8.5 over two future time-slices, i.e. near-century and mid-century using the CORDEX datasets.

Daily mean temperature significantly affects phenology and grain yield of spring wheat. An increase in temperature is expected to shorten the crop lifecycle and lowering grain yields as a result of faster accumulation of GDDs in wheat crop. Studies indicate that temperatures in the southern part of Pakistan have shown to exceed the thresholds at the times of flowering and ripening. An overall increase of 1000 Growing Degree Days (GDDs) between past and mid-century extreme scenarios (RCP8.5) has been observed in case of wheat, implying that southeastern side of Pakistan is likely to become unsuitable for wheat production due to temperature extremes in future.

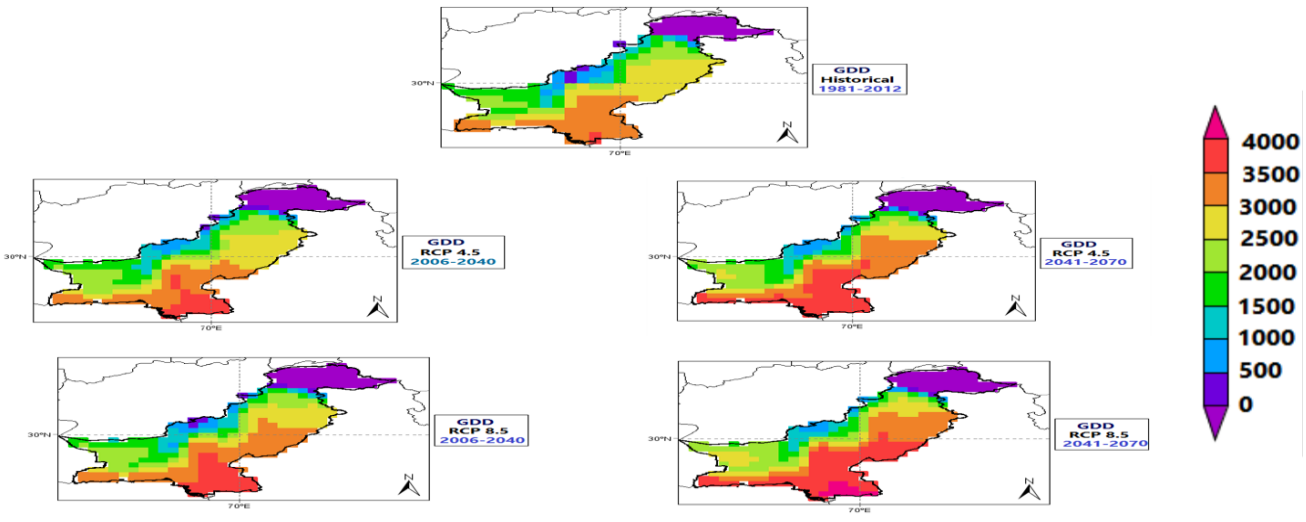

Figure: *Spatial mapping of seasonal GDDs over Pakistan for control, F1 (near century) and F2 (mid-century) for RCP 4.5 and RCP 8.5 contribution during the season.*

An urgent response is required to help combat heat stress in cereal crops in order to ensure sustainability in food security. It requires high-quality research and policy planning for adopting to local scale, nationally oriented and forward-looking climate-smart practices and well-suited adaptation strategies, for resilient agriculture. Based on our study results, it is suggested that strategies like bringing more area under cultivation in North-Western and Mid-Western sides of Pakistan, considering multi-cropping and terracing options, early planting to avoid heat stress, and developing drought tolerant and heat resistant varieties can be wise options to minimize climate change impacts on wheat crop in Pakistan.

g) Analysis of future warming extremes impacting crop growth stages in wheat

An analysis of future warming extremes (Consecutive Summer Day Index (CSU), impacting critical crop growth stages of wheat crop in Pakistan was also done. The study reports that Consecutive summer day index CSU. CSU 32 is consecutive 5 or > days of daily maximum temperature occurrences. 32 degrees is the threshold/upper limit in wheat during flowering, while threshold of 36 degrees was taken for ripening, beyond theses temperatures yield losses occur. It is evident from Observed data that South Eastern side of Pakistan is most vulnerable for flowering and ripening stages of Wheat Crop due to consecutive heat days.

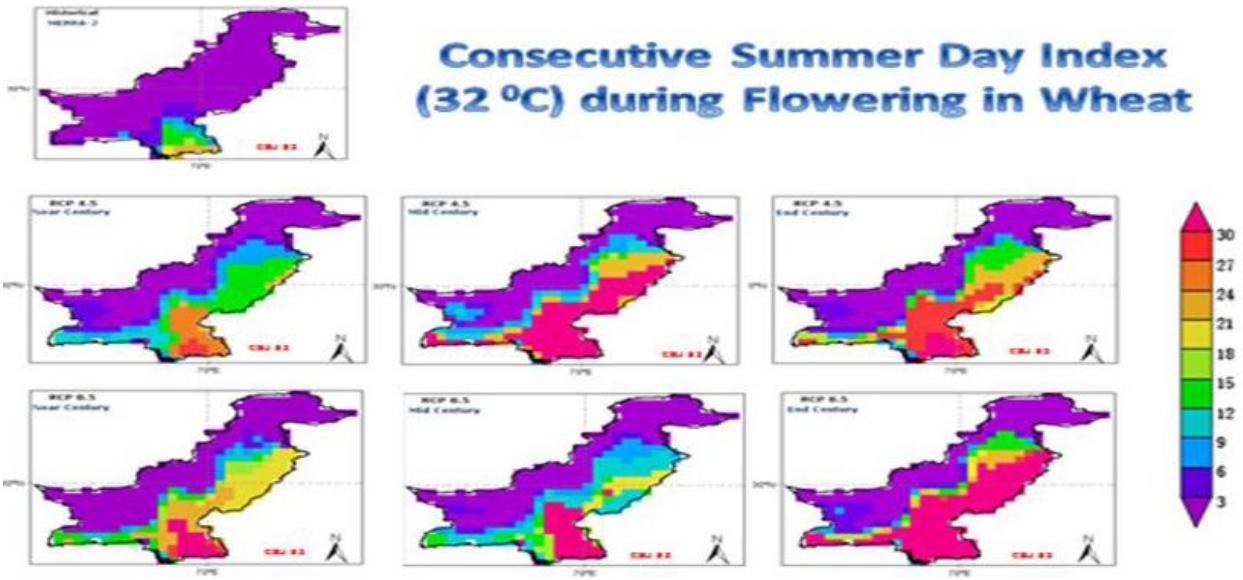

Figure: *Consecutive Summer Day Index at Flowering at flowering stage of wheat*

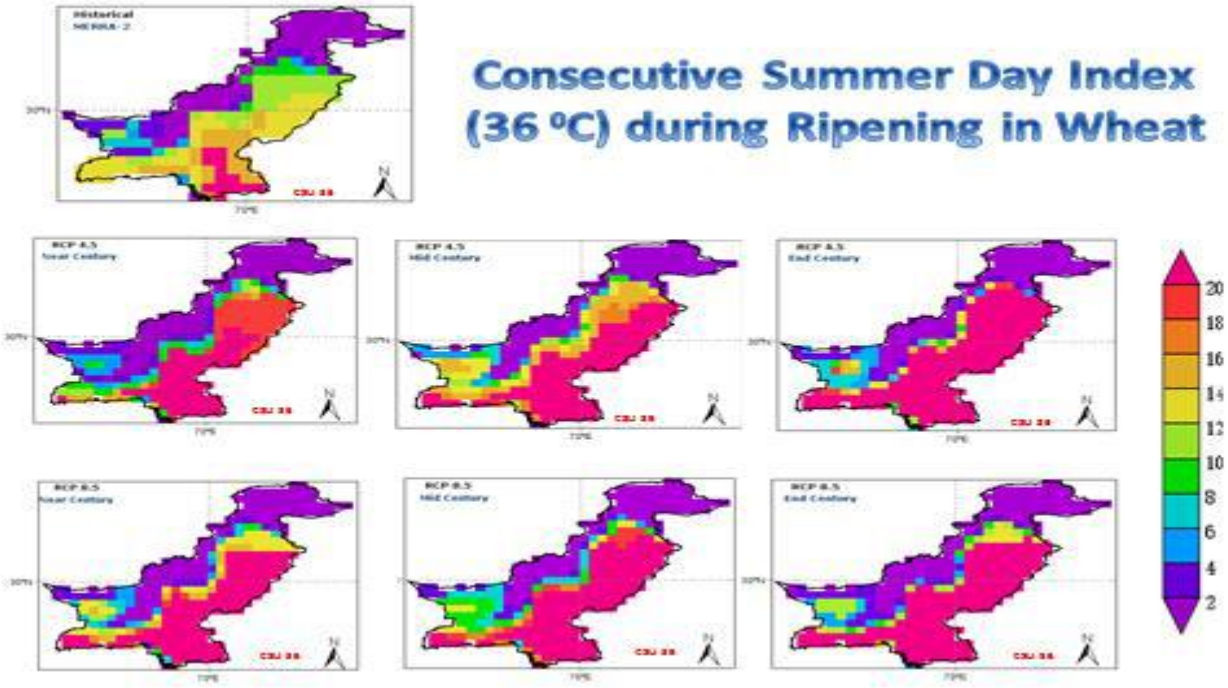

Figure: *Consecutive Summer Day Index at Ripening stage of wheat*

h) Modeling and Monitoring Wheat Crop Yield Using Geospatial Techniques: A Case Study of Potohar Region, Pakistan

The objective of the study was to evaluate the possibility of MODIS-derived vegetation indices using GIS and RS to estimate pre-harvest wheat yield in the Potohar region, Pakistan. Two MODIS product MOD15A2H and MOD13A1 for the period 2009–2018 were used for the derivation of LAI and indices. Wheat yield data of each district for the study period were obtained from the agriculture statistics of Pakistan.

Results shows that overall, the percentage average difference between the actual and predicted yield was within -1.986%. Average RMSE and MAE values ranged from 34.28 to 76.50 kg/ha and 108.09 to 129.99 kg/ha, respectively. The MBE value ranged from 7.20 to 62.80 kg/ha. The results concluded that accurate wheat yield predication can be made almost 2 months before harvesting using geospatial techniques along with the statistical modeling approach.

i) Implications of Remote Sensing Data under GIS Environment for Appraisal of Irrigation System Performance

Remote sensing and GIS tools were used to assess the performance of irrigation system performance. Potential water requirements of the area were found to be 401.66 million cubic meters (MCM) and available canal water supply was found as 247.14 MCM, thus indicating shortage of 38%. Water consumption of wheat was estimated by remote sensing to be 243.41 MCM which was comparable to the available canal water supply confirming accuracy of the proposed method. Adequacy of the system was found to be 74 % while its reliability varied from 35-73% throughout the wheat season. Strong correlation was found between crop yields and water supplies i.e. crop yield was strongly dependent on water supplied (R2=0.80).

j) Implications of Remotely Sensed vs Climate data in assessing Crop Water Ingestion using Machine Learning

The study has been conducted to estimate the seasonal Evapotranspiration of wheat using CROPWAT and SEBAL modelling approaches. The result showed that there has been strong relation of 93% between two approaches in finding seasonal Wheat ET for Peshawar region. Results favors the using of SEBAL model over the other regions of Pakistan where agro climatic data is limiting.

k) National Greenhouse Gas Inventory 2018

In the light of Katowice decision, National GHG Inventory of Pakistan based on the latest data sets available as part of the Pakistan BUR1 Project executed by the Ministry of Climate Change (MoCC) through GCISC has been prepared using IPCC 2006 Guidelines. This report presents the inventory of Pakistan for the year 2017-18 (herein called as 2018). This is third such effort by the Centre.

IPCC 2006 Guidelines have been used. The inventory includes four sectors viz. Energy including Transport; Industrial Processes & Product Use (IPPU), Agriculture, Forestry & other Land Use (AFOLU) and Waste. The activity data have been taken from Pakistan Energy Year Book (2017-18), Economic Survey of Pakistan (2019), Agriculture Statistics of Pakistan (2017-18), State of Industries Report (2018), FAO Stat 2018, FAO 2020 Pakistan Forestry Sector Review, FAO-Smog Report (2019) Country Report of Pakistan, Food and Agriculture Organization (FAO) of United Nations, National Forest and Rangeland Resource Assessment Study (NFRRAS 2004). Peshawar: Pakistan Forest Institute, Government of Pakistan and Supply & Demand of Fuel Wood & Timber for Household & Industrial Sectors & Consumption Pattern of Wood & Wood Products in Pakistan (2003-2004) called as Maanics Report (2004), OIGF, Ministry of Environment, Islamabad.

The total estimated emissions in terms of million tons of CO_2 equivalent for the year 2018 shows an increase in total GHG emissions when compared with the previous (1994, 2008, 2012 and 2015) inventories. The total estimated GHG emissions for the year 2018 are 489.87 million tons of CO_2 equivalents with i) Energy sector contributing (218.95), ii) Industrial processes (25.76), iii) Agriculture, Forestry and Landuse (223.45) and v) Waste (21.72) $MtCO_2$ equivalent, respectively.

Table: *Summary of Greenhouse Gas Emissions (2017-18)*

Sectors	**Sub-Sectors**	**Emissions (Mt CO_2 Eq)**	**Total Emissions (Mt CO_2 Eq)**
Energy	Energy Industries	43.40	218.94
	Manufacturing Industries and Construction	66.20	
	Transport	51.34	
	Others (commercial, residential & agricultural)	44.06	
	Fugitive Fuel emissions	3.94	
Industrial	Mineral industry	22.75	25.76

Processes and Product Use (IPPU)	Chemical Industry	2.71	
	Non Energy Fuel and Solvent use product	0.10	
	Others (paper & pulp, Food 7 beverages)	0.20	
Agriculture, Forestry and Other Land use (AFOLU)	Livestock	109.12	223.45
	Land	31.52	
	Managed Soils	74.98	
	Rice Cultivation	7.83	
Waste	Solid Waste Disposal	10.23	21.72
	Waste incineration and open burning	0.9	
	Wastewater treatment and discharge	11.90	
	Total Emissions		**489.87**

l) Establishment of MRV System for GHG Inventories

Through its Article 13, the Paris Agreement established a framework of enhanced transparency (ETF) to regularly measure the progress made by countries to strengthen the global response to the threat of climate change. The purpose of the framework for transparency of action is to provide a clear understanding of climate change action in the light of the objective of the Convention as set out in its Article 2, including clarity and tracking of progress towards achieving Parties' individual nationally determined contributions under Article 4, and Parties' adaptation actions under Article 7, including good practices, priorities, needs & gaps, to inform the global stock take under Article 14.

The objective of the new international adopted framework is to enable the implementation of mitigation, adaptation and support actions as well as their monitoring over time. This monitoring will be reported on a regular basis as part of the BTR (Biennial Transparency Report) which will replace the BUR (Biennial Updated report) by 2025. In this context, the inventory of GHG emissions as well as the action monitoring indicators are essential for the monitoring and confidence of the international community.

Within this framework, Pakistan is a signatory Party to the Paris Agreement, and Ministry of Climate Change (MoCC) is the official governing representative of Pakistan for the implementation and compliance of the reporting to the UNFCCC. In this context, the Global Change Impact Studies Centre (GCISC) is developing a web based platform for the MRV of GHGs.

m) Pakistan's First Biennial Update Report (BUR1)

BURs are reports to be submitted by non-Annex I Parties, containing updates of national Greenhouse Gas (GHG) inventories, including a national inventory report and information on mitigation actions, needs and support received. Such reports provide updates on actions undertaken by a Party to implement the Convention, including the status of its GHG emissions and removals by sinks, as well as on the actions to reduce emissions or enhance sinks. Ministry of Climate Change is implementing Project on

'Preparation of Pakistan First Biennial Update Report (BUR1) under United Nations Framework Convention on Climate Change (UNFCCC), with financial support from Global Environment Facility (GEF) through United Nations Environment. GCISC has been assigned to contribute to the chapters on Greenhouse Gas Inventory, National Circumstances, Information on domestic Measurement, Reporting & Verification and Information of Technical support needs and provided. The report is in the final stages of its submission to the UNFCCC.

n) Revision of Nationally Determined Contributions (NDC)

The Paris Agreement (Article 4, paragraph 2) requires each Party to prepare, communicate and maintain successive nationally determined contributions (NDCs) that it intends to achieve. Parties shall pursue domestic mitigation measures, with the aim of achieving the objectives of such contributions. Nationally determined contributions (NDCs) are at the heart of the Paris Agreement and the achievement of these long-term goals. NDCs embody efforts by each country to reduce national emissions and adapt to the impacts of climate change.

In fulfillment of the aforementioned obligation, a study regarding Pakistan's Intended Nationally Determined Contribution (INDC), to be submitted to UNFCCC before the start of COP-22, was initiated by Ministry of Climate Change in June 2016. GCISC was declared its secretariat. GCISC contributed to this NDC study by preparing the GHG inventory for the year 2014-15 and providing other technical inputs and collaborative support for the study. Pakistan's 1st NDC document was submitted to UNFCCC in Nov. 2016 which commits to reduce up to 20% of its 2030 projected GHG emissions, subject to the availability of international support. The document is available at UNFCCC website.

Under the PA, countries revise their NDCs every five years to cut GHG emissions to limit Earth's temperature rise and implement solutions to adapt to the effects of climate change. The updating of NDCs presents countries with significant opportunities to align their climate and development agendas to promote sustainable growth, but also presents challenges in reinventing policies and operations and mobilizing enough investment. Ministry of Climate Change initiated the NDC revision process in 2020. GCISC is contributing to the revision process and has been declared as the Secretariat.

B. Capacity Building:

Capacity building is an important component of GCISC's activities. During 2020-21, the Centre's scientists participated in a number of national/ international training workshops and acquired new skills ranging from climate science, climate modeling, seasonal forecasting, early warning systems, climate data analysis. drought monitoring and assessments, hydrological, crop simulation and water management modeling, water surface runoff analysis, water-food-energy nexus, to earth observation systems, space technology and RS/GIS tools. The acquired skills are being used for the ongoing and planned research activities at the Centre. GCISC's scientists also contributed as resources persons in various seminars and training workshops.

The Centre with the support of GIZ-Pakistan and CITEPA-France organized as series of training workshops on the preparation of Greenhouse Gas Inventories using IPCC 2006 guidelines. Fifteen professionals from GCISC, MoCC, National Ozone Unit, National Energy Efficiency and Conservation Authority, REDD+ Pakistan, Pakistan Forest Institute, Ministry of Industries and Production, University of Arid Agriculture and Fatima Jinnah Women University were trained in the sectors of Energy, Transport, Industrial Processes and

Product use (IPPU), Agriculture, Forestry & Other Land Use (AFOLU) and Waste Sectors. The trained professionals will not only effectively contribute in GHG inventory preparation but also will serve as future trainers.

Eight students from different universities attended GCISC as Interns for a period of 2-3 months. The Centre's researchers provided them orientation lectures on climate science, modeling and other analytical skills and supervised them for various studies pertaining to assessment of climate change impacts on crops, soil surface salinity and data analysis for climate studies.

C. Mass Awareness / Media Appearance:

The Centre's scientists gave interviews on various media channels and published several news articles in the leading national newspapers on the various aspects of climate science and its associated impacts on water, agriculture, and forestry. Interviews were with the Voice of America, Reuters and other leading national media groups on the specific aspects of wheat crisis, locust havoc, introduction and production of high value crops like olives and grapes in the Potohar area in the context of changing climate.

D. Inputs for Parliamentary Business

GCISC, being the research arm of the Ministry of Climate Change is oftenly asked for providing technical inputs on climate change, impacts and response strategies for parliamentary business. In this regard GCISC provide answers to National Assembly and Senate questions and also contributes to the proceedings of the standing committees on the concerns of climate change. During 2020-21 GCISC provided responses to three (3) NA/Senate starred questions and provided inputs (presentations/ briefs) for NA Standing Committee on Climate Change on the aspects of Climate Change, Agriculture and food security. GCISC also provided technical inputs to various reports and submitted responses to various queries reading Joint and Inter Ministerial coordination meetings, Bilateral Consultations and memorandums etc.

ISLAMABAD WILDLIFE MANAGEMENT BOARD

1. INTRODUCTION

The Islamabad Wildlife Management Board was constituted under "Protection, Preservation, Conservation and Management" (PPC&M) Ordinance, 1979. The Purpose of this Board is to implement the PPC&M Ordinance 1979 and its Rules 1983, making sure to the Wildlife and Environment of Islamabad Capital Territory (ICT). Accordingly, Margallah Hills National Park (MHNP) was notified as National Park of Pakistan in 1980. The covered area of this National Park is 67 Square Miles in addition to that the Rawal Lake and Shakarparian areas are also declared as the National Park of Islamabad.

In 1981 Federal Government notified a Wildlife Management Board. This Board was chaired by Chairman of Capital Development Authority (CDA) and included officials from CDA and Federal Government. The Board remained dysfunctional, and MHNP was managed through Environment Directorate of CDA without involving the notified Board.

On September 30, 2014, Prof. Z B Mirza, a prominent zoologist and field expert, filed a petition in the Islamabad High Court (IHC) maintaining that the MHNP was facing severe degradation due to lack of attention from CDA.

After its declaration as a protected area in 1980, the Margallah Hills National Park was managed by the Capital Development Authority (CDA). However, in 2015, the Islamabad Wildlife Management Board (IWMB) was set up under Section 4 of the Islamabad Wildlife (Protection, Preservation, Conservation and Management Ordinance 1979, Government of Pakistan).

The IWMB is the legal custodian of the National Parks in ICT and involved in protection, conservation and management of the Margalla Hills National park. The aim is to minimize anthropogenic impacts on the ecological resources of the national park through a park protection programme from threats such as illegal extraction of park wood, exploitation of wildlife species, forest fires, illegal construction and encroachment. In addition, the IWMB is working with the local communities of the Park to raise their environmental awareness, educate them and improve their living conditions.

1.1 OBJECTIVES:

The IWMB has the following objectives:

- 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 the illegal trade of wildlife species in ICT.
- 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.

1.2 MARGALLAH HILLS NATIONAL PARK:

Margallah Hills National Park lies adjacent to the capital city of Islamabad. To the northwest is the incipient industrial center of Taxila. Encroachments from these urban areas pose serious threats to the integrity of the wilderness of the Park. However, the foremost and most serious threat to the Park is from the communities living inside the Park which have increased in population over the years. These local communities allow their livestock to graze freely and this destroys the vegetation cover and tramples young seedlings. In addition, the locals cut tress for fuel, gather fodder for their animals, and divert natural water streams to cultivated plots near their homes. Some residents even hunt native animals such as hares and birds for food and sport. Solid and liquid waste is not disposed of adequately with consequent negative impacts for the environment and ecological resources.

There are a number of rock mining quarries in the Park where the habitat is severely degraded. Quarries operate on lease arrangements made by the Planning Directorate of the CDA. Some leases were granted after the park was established but public pressure brought mainly by a citizen's group "*The Margallah Hills Society*", forced the termination of such leases. The CDA ordered the closure of all mines on 31 July 1991. Most of the quarries have discontinued operations and others are expected to be closed in the near future. The Fecto Cement company's 30-year lease for mining limestone, granted in 1983 is however, not included in this order.

Fires are a fairly common occurrence in the Margallah Hills and require significant expenditure and manpower to extinguish. Eighty-five per cent of these fires occur during the dry May-June period preceding the monsoon rains. The number of fires averaged 43 per year between 1986 and 1991. Most of the fires occur on the upper slope or ridge top sites on southern aspects and tend to be manmade.

Alien invasive vegetation species out compete native species and grow at an alarming rate, negatively impacting the delicate balance of the park ecosystem. The unscientific introduction of exotic vegetation like Paper Mulberry, *Parthenium Spp.* and *Lantana Spp.* has not only impacted the vegetation balance but also led to an increase in 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 Margalla Hills Range within the MHNP. There are 32 species of reptiles and 9 species of amphibians reported in this park

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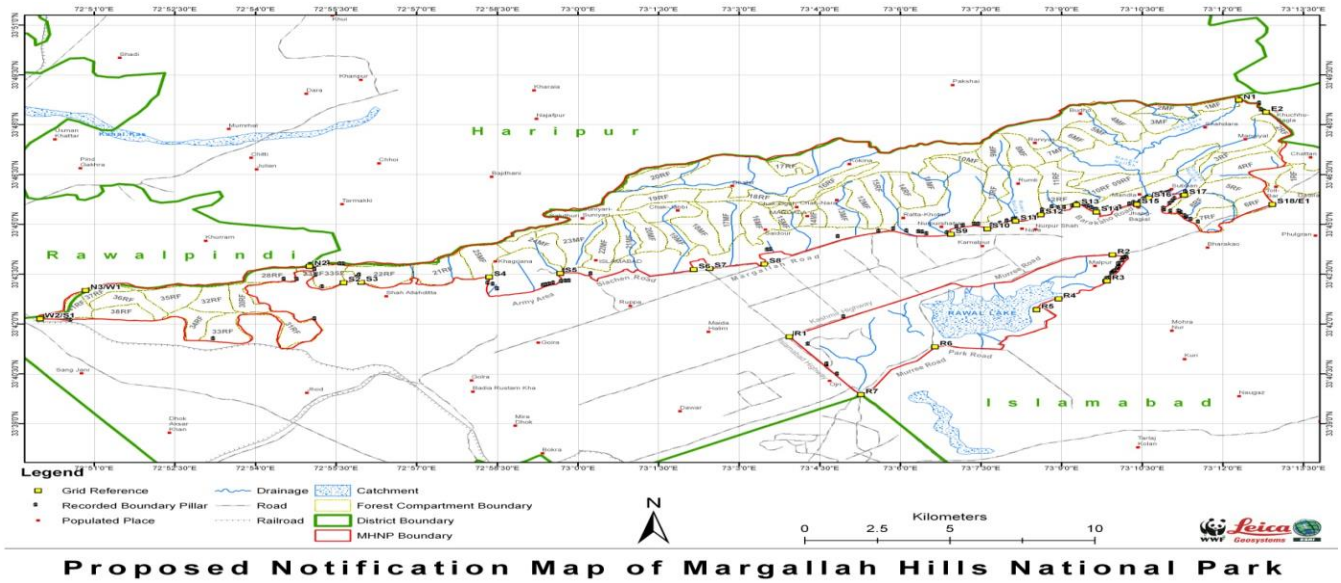


Proposed Notification Map of Margallah Hills National Park

1.4 GOVERNING BODY:

In pursuance of approval of the Prime Minister, conveyed vide Prime Minister's Office F. No.6(9)/020-Admn-UU-IWMB dated 23.11.2020, Rina Saeed Khan, was appointed as the Chairperson of the Islamabad Wildlife Management Board and in exercise of the powers conferred by section 4 of the Islamabad Wildlife (Protection, Preservation, Conservation and Management) Ordinance, 1979 (LXX of1979) read with sub rule (a) of rule 2A of Islamabad Wildlife (Protection, Conservation and Management) Rules, 1983, Federal Government reconstituted a Board of Wildlife Management on October 23rd, 2020 consisting of the following members, namely;

1.4.1 EX.OFFICIAL MEMBERS:

01.	Sr. Joint Secreatry orJoint Secretary, Ministry of Climate Change	Member
02.	Inspector General of Forests, Ministry of Climate Change	Member
03.	Deputy Commissioner, ICT or nominee	Member
04.	Director (Environment) Metropolitan Corporation, Islamabad	Member
05.	Director (Regional Planning), Capital Development Authority	Member

1.4.2 NON-OFFICIAL MEMBERS:

06.	Mr. Zahid Baig Mirza, Biodiversity Expert	Member
07.	Ms.Imrana Tiwana, Environmental and Natural Resource Expert	Member
08.	Ms. Rina Saeed Khan, Outreach and Visibility Expert	Member
09.	Mr. Vaqar Zakria, Member Civil Society	Member

1.5 ORGANIZATIONAL STRENGTH:

The IWMB has a team of 26 members that are working for the conservation and protection of wildlife species and National Park in Islamabad.

1.6 COMMITTEES IN IWMB:

The IWMB has 5 Committees, Protection Committee, and Scientific committee, Legal Committee, HR Committee, Accounts and Finance Committee. Each committee has a chairman and three members who look after their respective tasks.

1.6.1 Protection Committee:

Protection committee headed by Senior Management of the Ministry is involved in making policies and plans for the protection of the wildlife and Margalla Hills National Park in Islamabad. Protection committee of IWMB stopped the illegal activities in the park. The field staff of IWMB are involved in the routine patrolling from Margalla road to the top of the Monal, they look for the encroachment, illegal hunting, illegal trading, poaching, wildlife rescue, wildlife monitoring and wood cutting etc.

1.6.2 Scientific Committee:

Scientific Committee chaired by Professor Zahid Baig Mirza (Biodiversity Specialist) is involved in drawing plans and policies for carrying out the researches and scientific studies in the MHNP.

1.6.3 Legal Committee:

Legal committee chaired by Mr. Vaqar Zakaria (Member Civil Society) looks after the legal issues of the board.

1.6.4 HR Committee:

HR committee of IWMB chaired by Mr. Muhammad Sulyeman Khan (Inspector General Forest) Ministry of Climate Change looks after the recruitment and service of current employees.

1.6.5 Accounts and Finance Committee:

The committee chaired by Mr. Vaqar Zakaria (Himalayan Wildlife Foundation) makes the budgets and accounts related tasks of the IWMB.

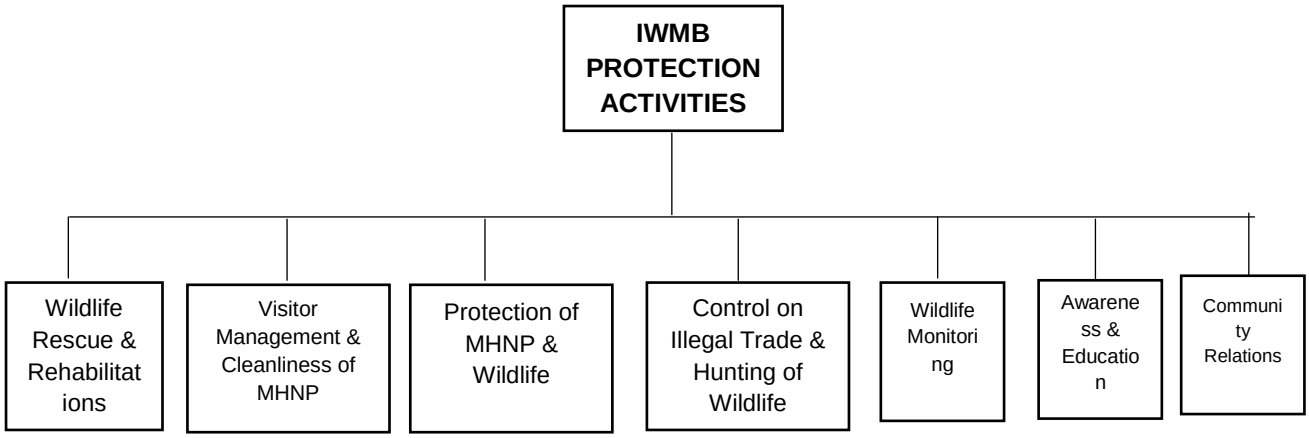
2. ACTIVITIES:

2.1 PROTECTION OF WILDLIFE IN MHNP & ICT

Private settlements, quarries, construction of roads, water contamination and introduction of exotic plant species are some of the factors affecting biodiversity in Margallah Hills National Park (MHNP).

“Illegal construction and encroachments by individuals and private housing societies, quarries and cutting of trees are not only disturbing the ecological system, but also robbing MHNP of its natural beauty,” The Margalla Hills National Park was transferred to the Islamabad Wildlife Management Board after its formation on July 7, 2015 and the Board is the legal custodian of the National Park. Currently 60 protection staff members are involved in looking after 12 valleys, trails and features of MHNP. Currently overall Protection is being conducted in following area;

- Patrolling by Guards in their assigned areas
- Patrolling by supervisors to monitor the protection activities
- Joint patrolling with Pakistan Navy staff
- Intelligence based raids/operations
- At random Field visits by Manager Operations
- Keep an eye on encroachments, timber mafia, poaching, hunting and forest fire.
- Check violations by any culprits and report in time
- Report fire incidents in AOR
- Keep vigilant on the selling/purchasing of wildlife in local markets.
- Monitoring of wildlife species in Margallah Hills National Park
- Wildlife rescue activities.



Different areas of Protection done by Islamabad Wildlife Management Board

2.1.1 Wildlife Rescue & Rehabilitation:

Wildlife Rescue & rehabilitation is the treatment and care of injured, orphaned, or sick wild animals so that they can be released back to the wild. IWMB team fully equipped with latest gear to rescue the wild animals from the MHNP and ICT. A designated team of IWMB work in this wing and doing their best as per international standards.

The IWMB has signed a letter of support with Join Hands, a team of international wildlife experts based in the United Kingdom, the United States, and Switzerland, to work on detailed plans for a wildlife center to replace the former Marghazar zoo. The wildlife center would recognize the need to address rescue and rehabilitation of Pakistan's most vulnerable species and includes an educational center for children as well as office spaces for IWMB.

2.1.2 Visitor Management & Cleanliness of MHNP:

Visitor management on trails of Margallah Hills National Park is most important component of wildlife conservation. The tourist pressure on trail increases day by day which was managed by the IWMB team work in this wing. The responsible tourism promoted in Margallah Hills National Park to conserve and preserve the natural beauty. The staff deputed on the trails clean the trail time to time and control plastic pollution from national park.

2.1.3 Protection of MHNP & its Wildlife:

Protection of MHNP and wildlife is core responsibility of IWMB. The staff deputed on different valleys of Margallah Hills National Park to protect the natural resources and wildlife. There are 38 species of mammals, 350 species of birds, 32 reptiles, 09 species of amphibians and 650 species of plants in Margallah Hills National Park.

The truth is that Margallah Hills National Parks is not chunks of untouched wilderness set aside and protected for their wildlife and habitats. In fact, they fall into a different IUCN category altogether – protected areas that are 'managed mainly for landscape/seascape protection and recreation'. Time and again, commercial considerations are given priority over environmental concerns. And most of our national parks have now lost any favourable conservation status they ever had.

2.1.4 Control on illegal Trade & Hunting of Wildlife:

IWMB has moved against monkey "dancing" and the selling of birds in ICT by confiscating the wild animals found on streets and then releasing them back in the wild. Zero tolerance is being shown for those indulging in animal cruelty and wildlife trafficking in ICT. IWMB continues its rescue of other wild species like injured Kites and trafficked turtles.

2.1.5 Wildlife Monitoring:

The protection efforts undertaken by the IWMB during the last six (06) years have contributed to the stability of predator and prey population, and the preservation of the common leopards' natural habitats in Margallah Hills National Park (MHNP). A recent scientific study completed inside the Park represents the first large-scale assessment of leopard occurrence, distribution and activity pattern within boundaries of MHNP. The camera trapping survey was conducted from February 2021 to May 2021. The study reveals that MHNP, the only protected area in Islamabad Capital Territory, hosts a number of leopards in an area of 17386 hectares. Some of them were found to be living between Kalinjar Valley/Trail 6/Chantan Da Gali in the core zone of the National Park which have been shut to public since earlier this year. IWMB would now like to declare this area of approximately 32 square km as a "Leopard Preserve". Already this area has been closed to visitors since February 2021 resulting in ecosystem regeneration of the area and the return of endangered wildlife like the Indian pangolin.

2.1.6 Awareness and Education:

Environmental Education (EE) refers to organized efforts to teach how natural environments function, and particularly, how human beings can manage behavior and ecosystems to live sustainably.

2.1.6.1 Details of the Awareness Activities

The activities are discuss in details and how they make an interesting activity related to environmental education during the year July-2020 to June-2021. The detail is given below;

2.1.6.2 Introduction of Marghalla Hills National Park

The presentation about the introduction of Marghalla Hills National Park (MHNP), which include;

- Biodiversity of MHNP
- Wildlife hotspots of MHNP
- Plant species of MHNP

2.1.6.3 Field Based Activities:

Islamabad wildlife Management Board (IWMB) provide an opportunity to students involve in our practical field based activities. Through these activities students are involved and they look, observe and write on activity sheets.

- Birds watching Activity
- Pug Mark survey/Casting
- Foot Print Casting
- Pond Dipping
- Soil Making Activity
- Seed balls Making Activity
- Carcass investigation /nature scavenger hunt
- Tree identification
- Find direction without compass
- Food Web Activity
- Tent Pitching
- Guided trek
- Conclusion & question answer of the session

2.1.7 Community Relation

The main aim of the community relations programme is to establish and maintain an understanding with Margallah Hills National Park's custodian communities (32 villages) to conserve and manage Park's natural resources and raising their living conditions. From July 2020 to June 2021, under the community relations programme, area identification, community resource person selection, village committee formation, community awareness sessions and encroachment identification has been carried out. Social mobilization component is focusing on educating local communities and in the 32 villages in the whole park. The

ownership of the park when given to custodian community the wise use of natural resources done by these local peoples and protection efforts enhanced.

3. ROLE AND FUCNTION

The Islamabad Wildlife Management Board (IWMB) has been constituted by the Federal Government in terms of section 4 of The Islamabad Wildlife (Protection, Preservation, Conservation and Management) Ordinance, 1979 ("the Ordinance").

4. 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 the illegal trade of wildlife species in ICT.
- 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 the citizen to protect the wildlife and their habitat for future generations.
- Community engagement programs developed to empower the custodian communities to protect the Margallah Hills National Park resources in sustainable way.
- Scientific research on the Margallah Hills National Park resources to protect these assets scientifically.
- Promotion of Eco-Tourism and responsible tourism which lead to "Plastic Free National Park" follow the principal of "My Waste My Responsibility"

5. ACHIEVEMETS

5.1 Wildlife Rescue & Rehabilitation

Wildlife Rescue & rehabilitation is the treatment and care of injured, orphaned, or sick wild animals so that they can be released back to the wild. IWMB team fully equipped with latest gear to rescue the wild animals from the MHNP and ICT. A designated team of IWMB work in this wing and doing their best as per international standards.

During the year, 2020-21 following animals were rescued and released in natural habitat after necessary rehabilitation. The rescued animals belonged to a variety of birds and mammalian species, including buzzards, small and medium size mammals like civets, Monkeys and other carnivores.

5.2 Visitor Management & Cleanliness of MHNP:

Visitor management on trails of Margallah Hills National Park is most important component of wildlife conservation. The tourist pressure on trail increases day by day which was managed by the IWMB team work in this wing. The responsible tourism promoted in Margallah Hills National Park to conserve and preserve the natural beauty. The staff deputed on the trails clean the trail time to time and control plastic pollution from national park.

During the year 2020-21 the visitors and tourist were engaged to protect the park from plastic pollution. Every weekend Cleanliness activity done by the IWMB staff with volunteers.

Management Team worked on the following issues:

5.2.1 Awareness & Education:

IWMB team worked hard to raise awareness amongst visitors and tourists of Margallah Hills National Park to control plastic pollution. Nobody is allowed to take plastic bags and edibles in plastic packing inside the trails.

5.2.2 Following the IWMB principle: "My Waste, My Responsibility"

It is very difficult to collect trash inside the forest, IWMB follows the principle "My Waste My Responsibility". Every citizen is responsible for their own waste and dustbins are not recommended in wildlife areas.

5.2.3 Imposing Section-144 on Littering

IWMB requested District Administration-ICT to impose section-144 in MHNP this year to control the littering issue. Our law is weak and IWMB has drafted new Act: Islamabad Nature & Wildlife Management Act now being vetted by Estab. Division which will give us powers to fine people directly and to charge visitors fees.

5.2.4 Fines through District Administration

IWMB staff imposed fine to those who involved in the littering in Margallah Hills National Park through District Administration ICT.

5.3 Protection of MHNP & their Wildlife:

Protection of MHNP and wildlife is core responsibility of IWMB. The staff deputed on different valleys of Margallah Hills National Park to protect the natural resources and wildlife. There are 38 species of mammals, 350 species of birds, 32 reptiles, 09 species of amphibians and 650 species of plants in Margallah Hills National Park.

The protection done by the IWMB staff during the year 2020-21 the entire ecosystem of National Park enrich with wildlife speies and population trend increasing. The protection staff control following
5.3.1Control Wood Cutting in MHNP

The importance of plants to humans and just about all other life on Earth is staggering. Life as we know it would not be possible without plants. They are the main source of food for all animals, they are source of oxygen, medicine, fuel, furniture etc for humans but the current percentage of plants on earth is decreasing due to deforestation and illegal wood cutting.

The given below list of wood cutting cases have been reported carrying young trees and branches from the park, which create severe loss on young trees and also habitat of wildlife.

Sr#	**Detail of Culprits**	**Number**
01.	Head Loads	143
02.	Motorcycle Wood load	42
03.	Corolla Car (Fuel Wood)	12
04.	Suzuki Pickups loaded with fuel wood	05
05.	Fodder Collection	12
06.	Suzuki Bolan loaded with fuel wood	02
Total Violations		**216**

Note: *The woodcutting culprits was apprehended by IWMB team and handed over to CDA Forest officer for fine. IWMB staff does not have powers in rules to fine the culprits.*

5.3.2 Invasive Plant Removal

For conservation of natural habitat and preservation of national park it is of ultimate importance to remove alien invasive species and replace them with indigenous plants of MHNP. The IWMB protection team was involved in the removal of Lantana along the trail numbers 3, 5 and 6 one by one. Lantana species have been removed from the National Park and replaced by local plants like, pine, wild pomegranate and Kachnar etc.

In MHNP the numbers of indigenous species of plants are under competition with the invasive plant species. These invasive plant species release hormones under soil that deteriorate the hyphae present in the roots of these indigenous plant species. These hormones also effect on the regeneration of new saplings that naturally grow in the MHNP.

Under this project five areas of the plant removed from Alien Invasive Species in this year 2020-21 mostly *Lanatana camara* leading to promotion of growth of local indigenous trees of MHNP and increased awareness amongst citizens and others stakeholders with regard to the presence and impacts of *Lantana camara* in Islamabad has been achieved. *Parthenium spp*. has also been removed from that area.

Need to improve removal techniques;

- Scientific study required to control the invasive plants in MHNP.
- Latest technology required to remove the alien invasive plant species.

5.3.3 Protection of Wildlife from Forest Fire:

The fire season starts every year from April to August in Margalla Hills National Park. The fires in the Margalla can erupt due to several reasons such as rising temperatures, burning of garbage or dried leaves or even due to the discarding of burnt cigarettes in the forest area.

Islamabad Wildlife Management Board Fire Protection Plan:

Islamabad Wildlife Management Board (IWMB) was formulated a 'Fire Protection Plan', to protect the most valuable and visible forested part of the MHNP for 2020-21 year. Shortage of supervisory staff does not permit more area to be protected by IWMB staff. IWMB protect the wildlife species in its natural habitat through existing IWMB staff. However, forest fires from April to June 30th (caused 85% of the time by deliberate arson) in the MHNP every year during dry season cause immense loss of forest, undergrowth cover, damage to wildlife habitat, impact on wildlife and greatly disturb the citizens of Islamabad. The major impact of forest fires is on ground nesting birds, reptiles, amphibians, soil biodiversity and seeds of flora in National Park.

IWMB protects the habitat of wildlife in MHNP, especially ground nesting birds, reptiles and amphibians by developing SOPs which define expectations and responsibilities of all team members. Additional fire staff was hired each fire season from local communities (end April to June 30th) comprising 20 day wagers so staff strength is increased to 60.

Equipment provided to staff control the forest fire are;

- Fire Beaters
- Leave scrappers
- Fire extinguishers (Fire ball)
- Fire incident reports/damage reports are also prepared

Fire Control by IWMB Staff

A total 32 fire incidents were reported in Margallah Hills National Park in the year 2021 till end of May. There were five major fire incidents which affected forested landscape, natural ecosystem and their wildlife. Due to fires following losses occurred as per observation in the field:

1. Loss of habitat
2. Loss of nesting & breeding sites
3. Loss of reptilian fauna
4. Loss of young saplings

5. Loss of regeneration process

5.4 Control on illegal Trade & Hunting of Wildlife:

IWMB has moved against monkey "dancing" and the selling of birds in ICT by confiscating the wild animals found on streets and then releasing them back in the wild. Zero tolerance is being shown for those indulging in animal cruelty and wildlife trafficking in ICT. In this year 2020-21 following animals were recovered and released in the wild habitat;

Sr#	Name of Species	Scientific Name	Number	IUCN Status
01.	Common Leopard (Skin)	*Panthera pardus*	05	Vulnerable
02.	Himalayan Ibex (Trophy)	*Capra ibex*	01	Least Concern
03.	Rhesus Monkey	*Macaca mulatta*	12	Least Concern
04.	Indian Pangolin	*Manis crassicaudata*	02	Endangered
05.	Rose Ringed Parakeet	*Psittacula krameri*	14	Least Concern
06.	Grey Partridge	*Francolinus/pondicerianus*	03	Least Concern
07.	Black Partridge	*Francolinus francolinus*	12	Least Concern
08.	Chukar	*Alectoris chukar*	02	Least Concern
09.	Spotted Munia	*Lonchura punctulata*	487	Least Concern
10.	House Sparrow	*Passer domesticus*	5678	Least Concern
11.	Common Quail	*Coturnix coturnix*	04	Least Concern
12.	Baya Weaver	*Ploceus philippinus*	3546	Least Concern
13.	Bank Myna	*Acridotheres ginginianus*	1670	Least Concern
14.	Common Myna	*Acridotherestristis*	219	Least Concern
15.	Common Starling	*Sturnus vulgaris*	179	Least Concern
16.	Red Headed Bunting	*Emberiza bruniceps*	1890	Least Concern
17.	Rock Pigeon	*Columba livia*	03	Least Concern
18.	Indian Black Pond Turtle	*Geoclemys hamiltonii*	11	Endangered
19.	Brown Roofed Turtle	*Pangshura smithii*	13	Near Threatened
20.	Indian Roofed Turtle	*Pangshura tecta*	05	Least Concern
21.	Indian Flap Shell Turtle	*Lissemys punctata*	06	Least Concern
22.	Spiny Tailed Lizard	*Uromastyx spp.*	08	Least Concern
23.	Skin of different Animals (From Taxidermist)		12	
Total Population of Confiscated Species and Specimen			**13782**	

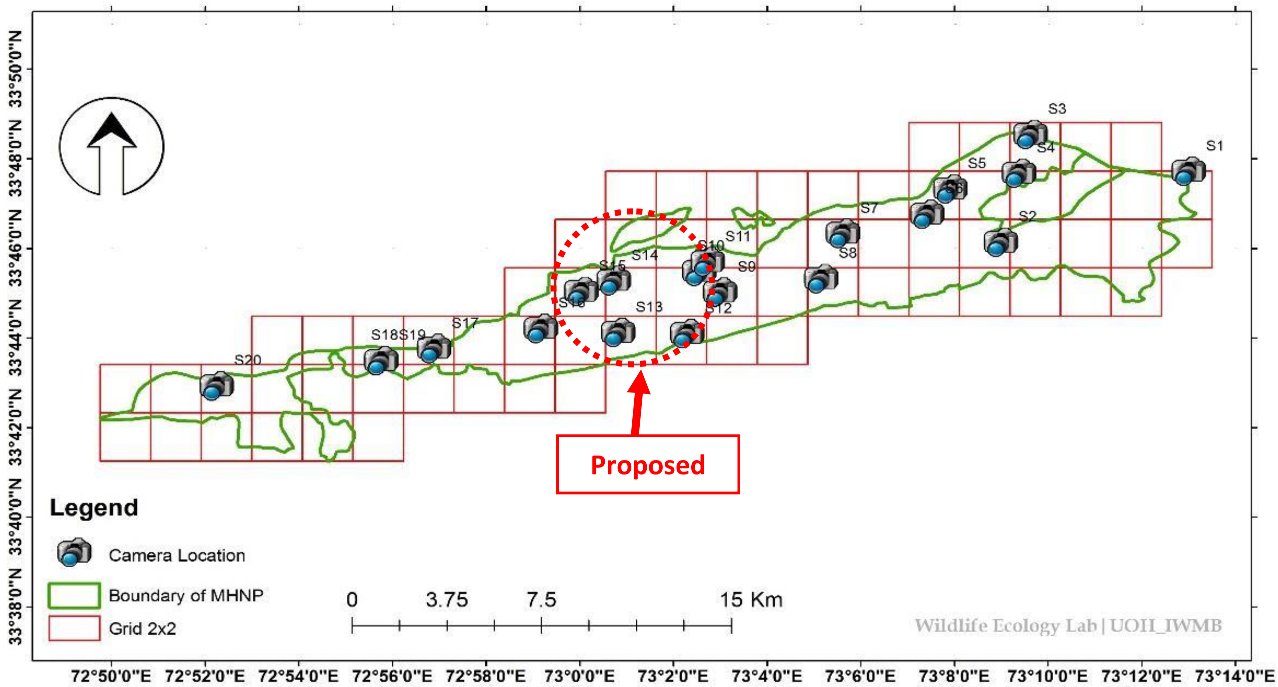
5.5 Wildlife Monitoring:

The protection efforts undertaken by the IWMB during the last six (06) years have contributed to the stability of predator and prey population, and the preservation of the common leopards' natural habitats in

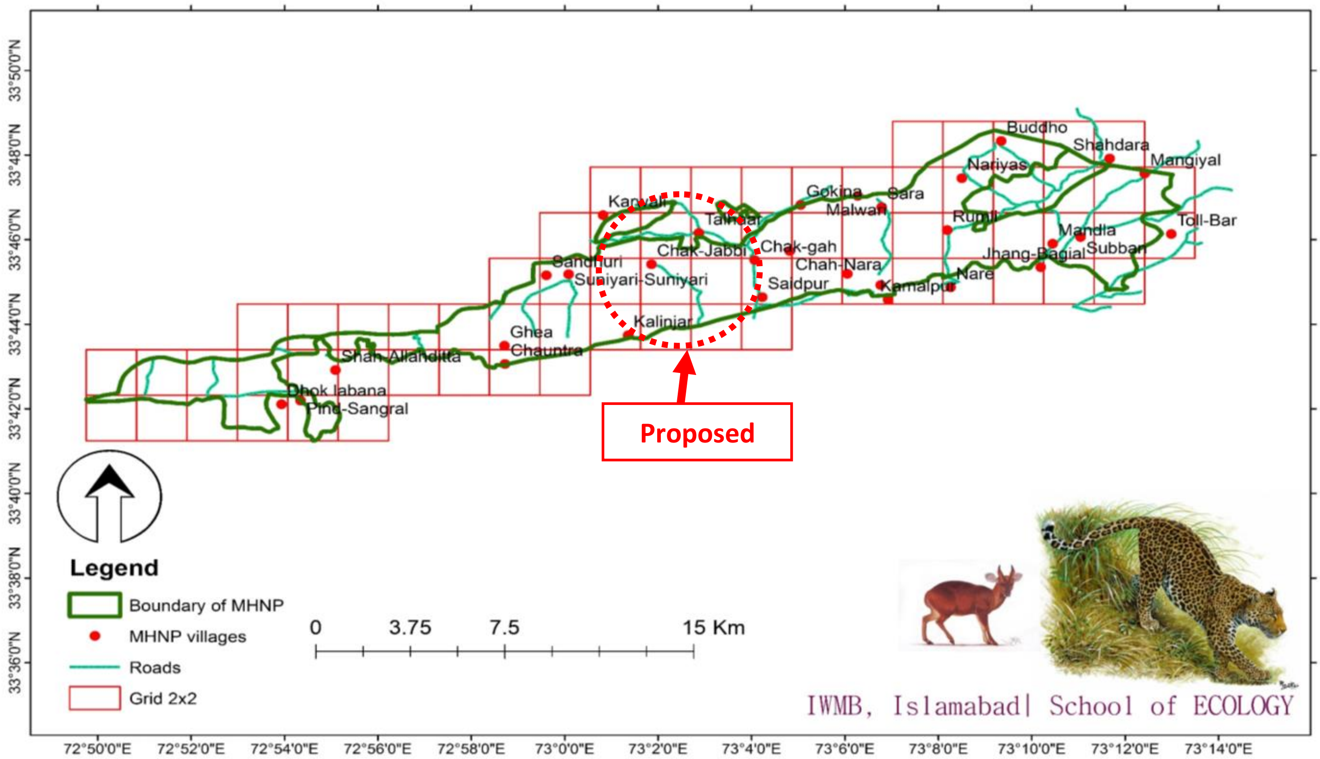
Margallah Hills National Park (MHNP). A recent scientific study completed inside the Park represents the first large-scale assessment of leopard occurrence, distribution and activity pattern within boundaries of MHNP. The camera trapping survey was conducted from February 2021 to May 2021. The study reveals that MHNP, the only protected area in Islamabad Capital Territory, hosts a number of leopards in an area of 17386 hectares. Some of them were found to be living between Kalinjar Valley/Trail 6/Chantan Da Gali in the core zone of the National Park which have been shut to public since earlier this year. IWMB would now like to declare this area of approximately 32 square km as a "Leopard Preserve". Already this area has been closed to visitors since February 2021 resulting in ecosystem regeneration of the area and the return of endangered wildlife like the Indian pangolin.

5.5.1 Camera Trapping Study:

This study represents the first large-scale assessment of leopard occurrence, distribution, and activity pattern in Margalla Hills National Park (MHNP). Camera trapping survey was conducted from April 2020 to May 2020. The whole study area was divided into fifteen blocks based on natural watersheds, which were unequal in size and were labelled (S1 – S15). A total of 20 motion-triggered cameras were installed with a minimum aerial distance of 1 km between two camera trap stations to maximize individual capture and sufficient recapture. The field observations, combined with camera trapping revealed a new scientific breakthrough, confirming the presence of the leopard in MHNP, photo-captured at 7 different locations across the study areas. Margalla Hills National Park, the only protected area in Capital Territory Islamabad, hosts 5-7 leopards in an area of 12802 ha. MHNP also provides habitat for several other globally threatened and ecologically important mammalian species including Indian pangolin, leopard cat, Jungle cat, barking deer, wild boar, red fox, Indian porcupine, masked civet, golden jackal, rhesus macaque, Indian civet, Indian hare, grey mongoose and yellow throated marten. The habitat suitability model predicted the suitable habitat of leopards in MHNP. The main predictors for habitat suitability included the elevation, Normalized difference vegetation index (NDVI), and distance to human settlements. This study provided the first-ever information on areas currently inhabited by leopards, helping prioritize the conservation efforts for leopards.



Proposed
Legend
Camera Location
Boundary of MHNP
Grid 2x2
0 3.75 7.5 15 Km
Wildlife Ecology Lab | UOH_IWMB



Proposed
Legend
Boundary of MHNP
MHNP villages
Roads
Grid 2x2
0 3.75 7.5 15 Km
IWMB, Islamabad| School of ECOLOGY

5.6 Awareness and Education:

Environmental Education (EE) refers to organized efforts to teach how natural environments function, and particularly, how human beings can manage behavior and ecosystems to live sustainably.

considering the mandate of IWMB, awareness sessions during July-2020 to June-2021 were conducted 17 with 983 participants, due to COVID-19 the sessions decrease in number. In these sessions mainly participate following institutions;

1. Local Schools Located in MHNP
2. Universities
3. Departments; NGOs
4. General Public/ Visitors of MHNP.

5.7 Community Relation

The main aim of the community relations programme is to establish and maintain an understanding with Margallah Hills National Park's custodian communities (32 villages) to conserve and manage Park's natural resources and raising their living conditions. From July 2020 to June 2021, under the community relations programme 06 sessions in which community engagement program started, and 88 kachnaar permits were issued to uplift the livelihood of the MHNP custodian communities.

6. RELOCATION OF MARGHZAR ZOO ANIMALS:

In compliance of orders of this Honourable Court, passed in Writ Petition 1155/2019, titled “Islamabad Wildlife Management Board vs. Metropolitan Corporation Islamabad and others”, Kaavan was successfully relocated to Cambodia, where he has retired and is happily settled in his new abode in the jungle/wildlife sanctuary.

Further, the two Himalayan Brown Bears; Suzie and Babloo were relocated to the Al Mawa sanctuary in Jordan. After undergoing treatment, they have now been released into their natural habitat within the sanctuary. The other animals shifted at suitable places in Pakistan. With the relocation of Suzie and Babloo, the former Marghazar zoo has now been shut and compliance of the orders of this Hon’ble Court has been ensured in true letter and spirit.

7. MARGALLAH WILDLIFE CENTER:

The administrative control and management of the area housing the former Marghazar zoo was handed over to IWMB by CDA on June 23rd, 2021. IWMB plans to use part of the area for Margallah Wildlife Centre which shall not be open to public. IWMB has successfully rescued and relocated two black bears from

different areas of the Punjab, who were being tortured by poachers. The bear sanctuary situated in Balkasar, Punjab does not have the capacity to host more bears, and therefore, the two rescued black bears were transferred to IWMB. The two black bears are in good health and are looked after by staff members who were trained at the Al Mawa sanctuary in Jordan.

8. OPENING UP GRADATION OF TRAILS:

IWMB has also worked on upgrading the other trails of MHNP since January this year by improving signage (maps, info signs, etc), regularly cleaning trails by collecting litter and protecting against erosion etc. IWMB also inaugurated Trail 4 in January this year, a new trail which has proven to be popular with the public and also cleaned up and re-launched Trail 2 which lies behind the former Marghazar Zoo, for public with proper patrolling.

9. BAN ON ANIMAL CRUELTY IN ICT:

IWMB has moved against monkey "dancing" and the selling of birds in ICT by confiscating the wild animals found on streets and then releasing them back in the wild. Zero tolerance is being shown for those indulging in animal cruelty and wildlife trafficking in ICT.

10. IWMB FIELD STAFF TRAINING:

IWMB protection staff field technique and reporting training given time to time. During this year following training session was done;

- Field techniques and reporting of observations
- Forest Fire Control
- Wildlife Monitoring and Identification techniques

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THE END